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The effect of the slowmation technique on attitudes towards social studies lessons, active learning, and metacognitive awareness

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Article Type
Original Research

Abstract:

The role and importance of technology applications in increasing the cognitive and affective learning of students have been accepted. For this reason, it has been considered important to use different materials and various educational technologies in the preparation of active learning environments. In this context, the effect of the use of the slowmation technique in primary school Social Studies Courses on students' attitudes, active learning, and metacognitive awareness was investigated in this study. The sample of the study, in which a quasi-experimental design was used, consisted of 4th-grade primary school students. The social studies attitude scale, active learning process scale, and metacognitive awareness scale for children were used. During the 5-week practices, slowmation covering different subjects were prepared. Parametric analyses were applied to the data obtained during the application process. According to the analyses performed, the slowmation technique was effective in improving the attitudes towards and active learning of the Social Studies Course. Based on the findings, the limitations of the slowmation technique were mentioned, long-term studies were suggested, and it was suggested to investigate the issue of permanence.

Keywords: *metacognitive awareness, primary school, slowmation, social studies attitude*

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INTRODUCTION

Social Studies Courses have important functions in providing the knowledge, values, and skills that individuals will need throughout their lives. In this context, Social Studies Courses require students to have skills for constructing knowledge and actively using it throughout their lives. This knowledge structure is gathered under the umbrella of metacognitive skills (Brown, 1977). In the event that an individual organizes this own knowledge, plans these studies, and evaluates this own learning situation by analyzing and synthesizing, it means that the individual employs these metacognitive skills (Flavell, 1979). It has been stated that individuals with metacognitive awareness in the educational environment achieve more permanent, successful, and active learning (Perry et al., 2019). Active learning is regarded as a component of metacognition (Dearnley & Matthew, 2007) therefore; the dependent nature of metacognitive learning and active learning is emphasized. At this point, the effect of technology on both active learning (Singhal et al., 2021) and increasing the metacognitive learning of students (Özkaya et al., 2016) is undeniable. Technology, which is a new tool for knowledge acquisition in the active learning process, has been a great advantage for individuals in obtaining information easily (Pappa et al., 2017). Active learning environments have been transformed by changing environments and opportunities. One of these opportunities is technology (Mutekwe, 2015). Thus, the students took place in the center of the learning process. It has been stated that technology-supported classrooms increase students' cooperation and interaction (Nicol et al., 2018) and learning motivation (Donkin & Kynn, 2021) and that students perform better than in traditional classrooms (Shieh, 2012). Thus, it is stated that technology-supported classrooms improve active learning compared to traditional classrooms (Park & Choi, 2014). In classrooms where instructional technologies are used, students stated that they enjoyed the Social Studies Courses which they attended (Shieh, 2012). Thus, students realize active learning (Green et al., 2018). Based on this context, using of technology and the active learning process are discussed together in this study.

Theoretical Framework

Active Learning

Active learning, which focuses on the student, is based on constructivist understanding (Açıkgöz, 2003). Active learning is a learning process that enables individuals to use their mental abilities in complex teaching processes in (Fleming, 2000) which they are responsible for their own learning (Eugène, 2006). In active learning, the teacher and the student share responsibility (Lee, 1999). Teachers should guide students by organizing active learning environments (Felder & Brent, 1996) and should allow their students to acquire learning skills that will enable them to construct knowledge (Russell et al., 2007). Social Studies Courses organized in accordance with active learning environments are stated to increase the permanence of learning, success, and positive attitudes of students towards the lesson (Özcan, 2019), eliminate misconceptions (Dündar & Aksoy, 2010),

stimulate historical consciousness, and provide an empathetic approach to events (Özcan, 2019). The use of different materials and various educational technologies is considered important in the preparation of active learning environments (Hatta et al., 2020; Holloway et al., 2021).

Metacognitive Awareness

The concept of metacognition, which was first introduced by Flavel (1979), is expressed as the cognition of one's own cognitive processes. Metacognitive knowledge is information that deals with the factors or variables that are effective in the cognitive process (Wilson, 1999), while metacognitive awareness is the individual's knowledge of the control of these cognitive processes and the strategies this uses (Flavel, 2000). In other words, metacognitive awareness is expressed as a way of learning to learn (Dunlosky & Metcalfe, 2008). The relevant literature indicates that metacognitive awareness is directly related to academic achievement (Cautinho, 2007) and if attention-grabbing activities are included in the classroom (Wagener, 2013) that the level of anxiety toward the lesson has decreased (Everson et al., 1994). Additionally, it has been reported that metacognitive awareness improves with technology-supported applications (Gama, 2001). At this point, it can be inferred that technology-supported course contents, especially at young ages, will contribute to the development of students' metacognitive awareness levels.

Using Slowmation in Education

Slowmation is an animation technique that consists of the processes of narrating a scientific concept that needs to be explained with models, taking photos, and slowing these photos down together in a digital environment (Hoban, 2005). The use of slowmation allows students to work in groups and communicate with each other, concretizing abstract subjects and making the concept simple and understandable. In studies in which slowmation is used, the contributions to collaborative learning among students (Brown et al.; 2013; Nielsen & Hoban, 2015) and the effects on academic achievement (Hoban & Nielsen, 2012; Hager, 2013) are mentioned. In addition, a positive attitude towards the lesson is gained with the slowmation technique (Brown, 2011), attempts are made to create conceptual and in-depth understanding (Devadason et al., 2012; Kidman et al., 2012), learning is facilitated, and positive contributions to 21st-century skills are made (Ochsner, 2010).

In the related literature, the slowmation technique has been used in pre-school (Mou et al., 2021), primary education (Brown et al., 2013; Shepherd et al., 2013), and secondary education levels (Mills et al., 2020; Occelli et al., 2017) and also has applications at the undergraduate level (Devadason et al., 2012; Hoban & Nielsen, 2012). Therefore, the technique can be used effectively at all levels. Different technological applications are included in the Social Studies Courses (Çelik, 2020; Hilton, 2016) and the attitudes of these applications (Koca & Daşdemir, 2016; Wieking, 2016) and their effects on critical thinking skills (Ünlü & Yang, 2020). Therefore, students' attitudes, active learning, and metacognitive

awareness can be tested in the Social Studies Courses with an experimental study to be carried out using the slowmation technique.

Social Studies Course is an interdisciplinary field due to its structure; it allows to bring content related to many different subject areas to the classroom (Maguth, 2012). Using of technology in the teaching of the course has undeniable importance, thanks to the structure of the Social Studies Course that is intertwined with life and covers all fields (Celik, 2021). Although the slowmation technique, which is a technological teaching tool, has an effect in various courses (Atalay et al., 2019; Mills et al., 2018), it is not used in Social Studies Courses. However, it is seen that some technological tools contribute positively to the learning of the lesson in the teaching of verbal concepts. Thus, the slowmation technique is important in concept teaching thanks to the modeling of the concepts and storytelling in the Social Studies Courses (Curry & Cherner, 2016). In this context, it is thought that it will be effective in using the slowmation technique as a teaching tool in the Social Studies Courses.

Purpose of the Research

Especially with technological applications for younger age groups, students' active learning (Donkin & Kynn, 2021) and metacognitive awareness (Gündüzalp, 2021; Teng, 2021) are seen to increase. According to the National Council for Social Studies (NCSS, 2013), the objectives of the Social Studies Courses are to have the ability to acquire and use information about the individual's community, nation, and the world, to act in cooperation throughout the process and to actively participate. Thus, students will gain lifelong learning skills. Technology has started to be preferred by teachers as a teaching tool in the classrooms to achieve the targeted goals for digital-age children (Instefjord & Munthe, 2017). In order to adapt to the digital age and to communicate with students, teachers also need to use technology in Social Studies Courses. Active participation and having technology literacy as 21st-century skills is an educational requirement for students (Erdogan & Serefli, 2021). These requirements are important in the Social Studies Courses as well as in every other course (Curry & Cherner, 2016). Although the research on the use of technology in Social Studies Course is limited (Celik, 2021; Erdogan & Serefli, 2021; Krutka et al., 2022; Ünlü & Yangın, 2020), the technology-supported Social Studies Course academic success, attitude towards the lesson and conceptualization of the contents (Curry & Cherner, 2016) are stated to have positive contributions. In addition, the Social Studies Courses includes knowledge and skills for solving the problems encountered in daily life. In the present study, the effect of the slowmation technique, which allows cooperative learning, on attitudes towards Social Studies Courses, active learning, and metacognitive awareness was investigated. For this purpose, the sub-problems created in the study are as follows:

1. Among the experimental and control group students; is there a significant difference between the attitudes towards the Social Studies Courses, active learning, and pretest scores related to metacognitive awareness?

2. Among the experimental and control group students; is there a significant difference between the attitudes towards the Social Studies Courses, active learning, and posttest scores on metacognitive awareness?

3. When the pretest scores were examined, did the slowmation activities cause a difference in the posttest scores of the experimental and control group students?

METHOD

Research Model

A quasi-experimental design, which is a quantitative research method, was used. Quasi-experimental studies are a research design in which groups are determined purposefully, not randomly (Gürbüz & Şahin, 2018). In this design (Table 1), the groups to be included in the experiment are selected without random assignment and the same tests are applied to both the experimental and control groups (Büyüköztürk et al., 2018). It is seen that the quasi-experimental design is suitable for the present study, in which the effectiveness of the slowmation technique is tested.

Table 1.

Reseacrh Model

Group	Pre-test	Implementation	Pos-test
Experimental	O_1	X	O_3
Control	O_2		O_4

$O_1 = O_3$= *Social studies attitude scale, social studies course active learning process scale; Metacognitive awareness scale for children-A*

$O_2 = O_4$= *Social studies attitude scale, social studies course active learning process scale; Metacognitive awareness scale for children-A*

Participants

The study sample consisted of students in the 4th-grade of a public school in Konya in the 2021-2022 academic year. A convenience sampling technique was used. Because implementations were done by a primary school teacher. In this technique, it is essential to collect data from a sample group that the researcher can easily reach (Büyüköztürk et al., 2018). In the present study, the researchers used this technique, which allows for the collection of data regarding time and space. The demographic characteristics of the students participating in the study are presented in Table 2. Thirty (49.3%) of the students in the study group were female and 31 (50.7%) were male.

Table 2

Demographic Features

		Control Group	Experimental Group	Total
Gender	Female	14	16	30
	Male	15	16	31
	Total	29	32	61

Data Collection Tools

The students' attitudes, active learning, and metacognitive awareness were examined. In this context, the relevant scales and an application form to collect the demographic information of the students were used. The measurement tools used within the scope of the study are introduced below.

Social Studies Attitude Scale (SSAS)

There are 12 items in this scale developed by Ulu Kalın and Topkaya (2017) to reveal the attitudes of 4th-grade primary school students towards the Social Studies Course. The scale is arranged in a 4-point Likert type and has a single-factor structure. Scale items are scored as 1: I totally disagree… 4: I totally agree. The lowest score that can be obtained from the scale is 12 and the highest score is 48. As the total obtained from the scale increases, the level of attitude also increases. The Cronbach's alpha value of the scale was reported as .84, and the value in the present study was calculated as .86.

Social Studies Course Active Learning Process Scale (SSCALP)

This scale developed by Burak (2020) aimed to reveal the active learning processes of primary school students in the Social Studies Course. The scale is a 4-point Likert type consisting of 30 items. Scale items are scored as 1: never… 4: always. The SSCALP consists of seven dimensions. These dimensions are "individual participation in the learning process", "group participation in the learning process", "participation in the extracurricular learning process", "teacher's participation in the learning process", "interest in the lesson", "importance towards the lesson", and "attitude towards the lesson". The stated reliability coefficient of the scale is .88, and the Cronbach's alpha value calculated for the present study is .92. This value is .59 for the first dimension, .68 for the second dimension, .66 for the third dimension, .82 for the fourth dimension, .58 for the fifth dimension, .83 for the sixth dimension, and .59 for the seventh dimension.

Metacognitive Awareness Scale for Children-A (Jr. MAI-A)

This was developed by Sperling et al. (2002) to measure metacognitive skills in primary school students; adaptation of Jr. MAI A and B forms to Turkish language and culture was conducted by Karakelle and Saraç (2007). The scale was adapted as the A form for the 3rd, 4th, and 5th grades of primary school and as the B form for the 6th, 7th, and 8th grades. In the present study, form A, which is suitable for primary school students, was used. The scale consists of 12 items and has a 3-point Likert-type structure (1: never, 2: sometimes, 3: always). A score between 12 and 36 can be obtained on the scale. A high total score indicates high metacognitive skills. The test-retest correlation value for the scale was reported as .74 and the Cronbach's alpha value as .64. The Cronbach's alpha value for the present study was calculated as .61.

Implementation and Data Collection

In the present study, in which the effect of the slowmation technique was investigated in the unit called "*where we live*" in the 4th-grade Social Studies Course, the primary school program was applied in the control group, while the slowmation technique was applied in the experimental group. The "*where we live*" unit of the Social Studies Course was chosen because it contains visuals, is suitable for photography and animation, and is thus suitable for storytelling the subject using technology. In addition, the unit covers a five-week period. After deciding on five different topics from those in the unit in the study, a slowmation was created each week with the students. Expert opinions (Ph.D. lecturer who has studies on technology, especially slowmation) were obtained during the creation and implementation of the animation. In this context, the slowmation was created week by week, considering the gains in the unit.

Week 1: Directions were discussed. The directions were indicated on the model sketches made of cardboard. The sketches were prepared together with the students and visuals made of cardboard were added to the sketches. At this stage, a student performed a voiceover in the background. During this voiceover, each movement in the sketch was photographed and created in slowmation.

Week 2: Natural and human factors were discussed. Then natural and human structures were gradually shaped by the students with play dough and then these structures were photographed. During this process, it was realized that natural elements were formed without human intervention and human elements were formed by human hands. With the photographs obtained, a voiceover was performed with the students and a slowmation was created.

Week 3: Weather conditions were discussed. After a one-week follow-up of the weather conditions and the temperature in the city where the students lived, the weather conditions were shown with symbols in the tables and graphs. In addition, weather events in different cities on the same day were shown on the map of Turkey. The students

photographed symbols, tables, and graphics, and a slowmation was prepared from these photographs.

Week 4: The subject of maps was discussed. The political map of Turkey was turned into a jigsaw puzzle and put together by the students, and each stage was photographed. The types of physical and human maps and the characteristics of these maps were illustrated by the students. Different colors were used in the pictures. Thus, height on physical maps and what this height means were made noticeable. The students actively participated in the preparation and vocalization processes of the slowmation animation.

Week 5: The subject of natural disasters was discussed. During this process, 2D models were created with waste materials found in nature. These models were then photographed at each stage. For example, attempts were made to explain how landslides occurred, using soil brought into the classroom. In the meantime, the students slowly moved the soil in their hands and photographs were taken during this time. When the whole photographing process was finished, a voiceover was added to the background and a slowmation was created together with the students. The creation process (Fig. 1) and sample demonstrations of the products (Fig. 2) are presented in the study.

Figure 1. Sample Images for the Slowmation   *Figure 2.* Sample Slowmation Images

Data Analysis

Within the scope of the study, it was determined whether the data showed a normal distribution before the data analysis. After providing the appropriate sample size (Büyüköztük, 2011), the Kolmogorov–Smirnov test results were analyzed ($p>.05$). In addition, skewness and kurtosis values for each scale were examined (Table 3) and it was seen that the normality assumptions for parametric data analysis were met (Hair et al., 2013). Then descriptive analyses in the study, indexed sample t-test, and ANCOVA were applied.

Table 3

Skewness and Kurtosis Coefficients of the Data

	S	Skewness	Kurtosis
SSAS -Pre-test	.587	1.462	1.487
SSAS -Post-test	.636	1.385	1.524
SSCALP - Pre-test	.504	-.304	-.674
SSCALP - Post-test	.518	-.912	1.005
Jr. MAI-A - Pre-test	.276	-.577	.352
Jr. MAI-A - Post-test	.279	-.473	.520

Ethical considerations

Ethical and security concerns were also considered during the study. The consent of the participants was taken into consideration in the study. In this context, parent consent forms were filled. Necessary permissions were obtained from the school administration. Accordingly, the related questionnaire was applied to the students face to face.

The ethical approval document was taken from a "Higher Education Institutions Scientific Research and Publication Ethics Directive."

Ethical review board name: Necmettin Erbakan University Ethical Review Board

Date of ethics review decision: 10.12.2021

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RESULTS

For determining the effect of the slowmation technique on primary school students' attitudes towards Social Studies Course, active learning, and metacognitive awareness, firstly, the equivalence of the pre-test scores of the experimental and control groups before the application was assessed (Table 4).

Table 4

Pre-test Scores of the Experimental and Control Groups

Scale	Groups	M	M/k*	S	df	t	p
SSAS	Experimental	19.15	1.59	.61	59	.01	.89
	Control	19.08	1.59	.56			
SSCALP	Experimental	93.90	3.13	.48	59	.98	.76
	Control	90.00	3.00	.52			
Jr. MAI-A	Experimental	28.32	2.36	.28	59	-.89	.55
	Control	29.04	2.42	.27			

*k=items number

According to Table 3, there was no significant difference between the scores of the students in SSAS, SSCALP and Jr MAI-A before and after the application (*p*>.05). This shows that the experimental and control groups were equivalent at the beginning of the study. Accordingly, SSAS scores were low for both groups, SSCALP scores were moderate for both groups and Jr.MAI-A scores were moderate for both groups. Accordingly, the posttest scores were analyzed to observe the effect of the practice carried out in the study (Table 5).

Table 5

Post-test Scores of the Experimental and Control Groups

Scale	Groups	M	M/k	S	df	t	p	*d*
SSAS	Experimental	23.52	1.96	.32	59	4.03	.00*	.56
	Control	16.32	1.36	.74				
SSCALP	Experimental	75.90	2.53	.26	59	2.68	.94	.26
	Control	70.50	2.35	.26				
Jr. MAI-A	Experimental	39.84	3.32	.33	59	3.77	.00*	.46
	Control	34.20	2.85	.58				

*p<.05

Table 4 shows the experimental and control groups' post-test scores from the SSTS, SBAI, and Jr. MAI-A. According to the results obtained, the points obtained from SSCALP decreased for both groups. Accordingly, when the attitude scores towards the social studies course are examined, it is seen that there is a difference between the experimental and control groups. Also, the mean score of the experimental group (M=1.965) was higher than the score of the control group (M=1.362) and this was statistically significant ($t_{(59)}$ = 4.033; p>.05). When the significant difference is considered in terms of effect size, it is seen that the effect (d=.56) is moderate (Cohen, 1988). When the post-test scores of metacognitive awareness of the experimental and control groups are examined, it is seen that there is a significant difference. Accordingly, it is understood that the mean score of the experimental group (M=3.321) was higher than the score of the control group (M=2.858) and this was statistically significant ($t_{(59)}$ = 3.772; p>.05). When the significant difference is considered in terms of effect size, it is seen that the resulting effect (d=.46) is at a low level (Cohen, 1988). On the other hand, it was observed that the active learning scores of the students in the social studies course did not differ between the experimental and control groups in the post-tests (p>.05).

In order to test whether the result obtained in the study was really due to the slowmation technique, all pretests were considered as covariant variables and the change in the posttests was examined (Table 6).

Table 6

ANCOVA Results Regarding the Difference in Post-test Mean Scores of Experimental and Control Group Students

Source	Type III Sum of Squares	df	Mean Square	F	p
	SSCALP				
Intercept	2.996	1	2.996	25,177	<.001
Group	1.795	1	1.795	15,085	<.001
Pre-test-SSCALP	4.700	1	4.700	39,498	<.001
Group * Pre-test SSCALP	1.234	1	1.234	10,369	.002*
Error	6783	57	.119		
Total	602.969	61			
	R Squared = .580 (Adjusted R Squared = .558)				
	SSAS				

Source	Type III Sum of Squares	df	Mean Square	F	p
Intercept	4.564	1	4.564	21.016	<.001
Group	.014	1	.014	.065	.800
Pre-test-SSAS	5.941	1	5.941	27.356	<.001
Group * SSAS	.963	1	.963	4.435	.040*
Error	12.379	57	.217		
Total	190.174	61			

R Squared = .491 (Adjusted R Squared = .464)

Jr. MAI-A					
Source	Type III Sum of Squares	df	Mean Square	F	p
Intercept	1.651	1	1.651	27.811	<.001
Group	.000	1	.000	.003	.954
Pre-test- Jr. MAI-A	.765	1	.765	12.882	<.001
Group * Pre-test- Jr. MAI-A	.006	1	.006	.104	.748
Error	3.384	57	.059		
Total	369.854	61			

R Squared = .277 (Adjusted R Squared = .239)

*p<.05

In Table 6, the change in the post-tests in terms of attitude towards the Social Studies Courses and active learning and metacognitive awareness was examined by ANCOVA. Accordingly, separate analyses were performed for each variable. When the active learning pre-test scores of the experimental and control groups were assessed, it was observed that there was a significant difference between the corrected post-test scores of the groups ($F_{(1.57)}$ =25.177, $p<.05$) and accordingly corrected post-test scores. When considered, it was seen that the experimental group scores (M=3.305) were higher than the control group scores (M=2.915). When the social studies attitude pre-test scores of the experimental and control groups were examined, it was seen that there was a significant difference between the corrected post-test scores of the groups ($F_{(1.57)}$ =21.016, $p<.05$). It was seen that the scores of

the experimental group (M=1.966) were higher than the control group (M=1.362). Finally, when the metacognitive awareness pre-test scores of the experimental and control groups were checked, it was determined that there was no significant difference between the corrected post-test scores of the groups (p>.05). This showed that the slowmation technique applied to the students did not significantly contribute to their metacognitive learning.

DISCUSSION

In the present study, the effect of the slowmation technique on primary school students' attitudes towards Social Sciences Courses, metacognitive awareness, and active learning in Social Studies Courses within the scope of the "*where we live*" unit of the 4th-grade Social Studies Courses were tested. As a result of the analyses conducted in the light of the collected data, some conclusions were reached. First of all, a significant difference was found between the attitudes of the experimental group, in which the slowmation technique was used in the Social Studies Courses, and the control group, in which the traditional teaching method was used, towards the Social Studies Courses. This difference is in favor of the experimental group in which the slowmation technique is applied in the Social Studies Course. In this case, it can be concluded that teaching with the slowmation technique is effective in developing positive attitudes towards the Social Studies Courses. This result obtained from the research is supported by various studies that show that technology-based techniques in the literature improve students' attitudes in Social Studies Courses (Koca & Daşdemir, 2016; Wieking, 2016). In addition, it has been observed that gaining a positive attitude towards the lesson and conceptual understanding increased in other lessons that include the slowmation technique (Devadason et al., 2012). Hoban and Nielsen (2012) stated that slowing down and dividing the subjects into sections in the slowmation technique helps students to grasp and understand concepts much better and provides opportunities for effective learning. This situation also contributes to the development of social skills of students who need special education (Shepherd et al., 2013). Therefore, it is seen that the slowmation technique, which has a wide coverage area, is effective in developing a positive attitude towards the lesson.

A significant difference was found between the experimental group, which was taught with the slowmation technique in the Social Studies Courses, and the control group, where the traditional teaching method was used, in terms of active learning for the social studies lesson. This difference is in favor of the experimental group in which the slowmation technique is applied in the Social Studies Courses. In this case, it is seen that teaching with the slowmation technique contributes to the active learning of the students in the Social Studies Courses. In this context, a student-centered, inquiry-based approach in social studies education has been supported by technology. Students are required to be active and questioning during the learning process so that they can become competent and relevant citizens, which is the ultimate goal of the Social Studies Courses. It is seen in the literature that similar studies have been carried out in different disciplines. A mixed-method study

was conducted by Mills et al. (2020) concerning 9th-grade students learning geology. According to the results obtained from the research, the active learning of the students who use the slowmation technique in the lesson is positively affected and the students have learning opportunities in applied and collaborative ways. In the literature, it is generally seen that technology-supported course materials increase active learning in accordance with the constructivist approach (Holloway et al., 2021). In a study conducted by Sinhal et al. (2021), it was determined that there was an increase in the active learning of students in classes in which digital technologies were used, compared to classes in which traditional methods were used.

Within the scope of the study, it was seen that the slowmation technique was not effective in increasing metacognitive awareness. However, there are different findings about this situation in the literature. While it is stated in some studies that the use of technology-supported instructional tools does not contribute to the metacognitive learning of students (Özabacı & Olgun, 2011), some studies have shown the opposite (Bakar & Ismail, 2020; Gündüzalp, 2021; Teng, 2021). The reason for obtaining different results on this subject in the literature may be related to the limitations of the slowmation technique (Hoban & Ferry, 2006). According to Hoban (2007), students need more time in the preparation process for the animations they prepare, sometimes they cannot be creative, and there may be misunderstandings when they cannot do enough preparation and research. Due to these limitations of the slowmation technique, it seems that it does not contribute enough to students' metacognitive learning, because during the process students may have focused on preparing the animation and metacognitive learning may not have been triggered. Also, active learning is a teaching technique that provides participation and cooperation in lessons (Özcan, 2019. Like active learning, slowmotion is a technique that provides the class acts in groups and participates actively in the lesson. The main purpose of both techniques is the participation and cooperation of the students in the lesson (Hatta et al., 2020; Holloway et al., 2021). Metacognitive awareness is the state of being aware of one's own learning strategy. There may be complex components that affect metacognition and the regulation and evaluation of mental activities of the individual constitute a comprehensive process. For this reason, although metacognitive awareness generally progresses in parallel with academic success and an active learning environment (Chan et al., 2021; Gonzalez Nieto, 2017; Pantiwati & Husamah, 2017), there are studies that show that the effect of metacognition may be diverse. For this reason, it is thought that the slowmation technique, which is a technology-based teaching technique, affects active learning but does not affect metacognitive awareness.

LIMITATIONS AND RECOMMENDATIONS

The results obtained in the current study showed that the slowmation technique was effective in developing positive attitudes towards Social Studies Courses and active learning, but not students' metacognitive awareness. This situation can be explained by the

limitations of the slowmation technique and reasons originating from the student or the teacher. In addition, the lesson was found to be quite different and enjoyable for students who were introduced to the slowmation technique for the first time, and this may have affected their attitude scores. Therefore, the results obtained from the study can be considered as both a contribution and a limitation to the literature. Finally, the study was carried out with 4th-grade primary school students over a 5-week period. The change or development in students' attitudes, active learning, and metacognitive awareness levels during the period after this process is completed is not known. Considering this limitation, it is recommended to conduct studies that measure longer durations and permanence. The effects of the technique on attitude and active learning are the desired findings, but students' opinions can also be included in order to consider the continuity of the findings. Considering the limitations of the study, it is recommended to carry out follow-up studies, thus underlining the effect of the technique on metacognitive awareness in long-term studies.

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Research

Back to the classroom: Teachers' views on classroom management after Covid-19

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Abstract:

The purpose of this study was to reveal the effects of the disruption to face-to-face education during the pandemic on the classroom environment upon return to the classroom. The participants of this case study were 16 teachers working in Turkey. The data were collected through semi-structured interviews and their contents were analysed. The study revealed that there were cognitive changes, motivation and concentration problems, social changes, discipline problems, and psychomotor changes observed in students' behaviours after the transition to face-to-face education. The sources of the behavioural changes were the family, the Ministry of National Education, being away from school, and use of technology. The strategies used by the teachers in terms of classroom management while managing the process after the transition to face-to-face education were management of teaching, behaviour management, management of relationships, and management of the physical environment.

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INTRODUCTION

As a consequence of the Covid-19 pandemic, which has affected all walks of life around the globe since the beginning of 2020, many governments have taken measures to restrict the mobility of their citizens. Such mitigation measures have also influenced schools' and universities' function. These sudden closures are regarded as a situation that will threaten education (World Bank, 2020). In fact, the United Nations report on "Education during COVID-19 and beyond" stated that the closure of schools and other learning areas affected 94 percent of the world's student population and 99 percent in low- and low- to middle-income countries. The crisis exacerbatings pre-existing educational inequalities by reducing opportunities for many of the most vulnerable children, youth, and adults to continue with their education (United Nations, 2020). Due to the prolongation of the measures taken and the continuation of the vaccine development studies, alternative methods have begun to be implemented to continue education and training activities (Reimers et al., 2020). When school buildings around the world were closed with the purpose of protecting the health of children and educators, many educators quickly turned to technology-oriented distance education (Sokal et al., 2020). The use of various online learning and teaching platforms has led to the reshaping of 21st-century classroom management within the scope of distance education (Apak et al., 2021).

A great impact of the pandemic on education is its potential disruption of all the components in the learning process. It would affect students' readiness and involvement, support of teachers, classroom equipment, safety and inclusiveness of schools, and system management (World Bank, 2020). This pandemic has created serious challenges for teachers all around the world. Teachers, all of a sudden, have found themselves needing to adapt quickly to an online teaching and learning environment. Accordingly, it has become important to arrange various educational contents in order to present all the subjects comprehensibly in the new learning environment. Classroom management is undoubtedly an issue that requires special attention in these chaotic times (Manea & Gări-Neguţ, 2021). The reason for this is that the classroom environment allows not only learning and cognitive development, but also the social, emotional, and psychomotor development of students. There are also studies indicating that socio-affective factors play an important role in the development of teacher–student relationships (Ansari et al., 2020; Hughes, 2012; Jones et al., 2014; Poulou, 2017).

Most of the studies on the pandemic focused on issues like teachers' opinions on distance education (Baran & Sadık, 2021; Han et al., 2021; Oducado, 2020), problems experienced in distance education (Kavuk & Demirtaş, 2021; Kultaş & Çalışkan, 2021; Saygı, 2021; Şahan & Parlar, 2021; Şenel Çoruhlu & Uzun, 2021), the effects of the pandemic on the education system (Bozkurt, 2020; Can; 2020a; Sarı & Nayır, 2020; Sezen-Gültekin & Algin, 2021), and virtual classroom management (Arslan & Şumuer, 2020; Can, 2020b; Hoang et al., 2021; Lathifah et al., 2020). However, with the transition to face-to-face education, the

effects of the process in which schools were closed constitute the starting point of our research. The aim in the present study was to reveal the effects of the disruption to face-to-face education during the pandemic on the classroom environment upon return to the classroom. Answers to the following questions were sought:

1. What kind of changes were observed in students' behaviours during the transition to face-to-face education after the pandemic? How did these changes affect the classroom environment?

2. What/who might be the source(s)/reason(s) of/for this change in student behaviour according to teachers?

3. What kind of strategies did the teachers use in terms of classroom management?

Theoretical Framework

Effective classroom management should not only be used to refer to controlling behaviour but also to create supportive learning environments that can respond to changing and complex needs (Brophy, 1998; Evertson & Harris, 1992). Good classroom management should embody discipline, routines for instructional and non-instructional tasks, flow of instruction in transition between subjects, classroom climate and environment, and arrangements for learning (Covino & Ivanicki, 1996). Moreover, classroom management requires establishing and maintaining a positive classroom climate based on respect, openness, fairness, and trust. A productive and positive classroom environment is the result of the teacher's consideration of students' academic as well as social and individual needs (Stronge et al., 2011; Tschannen-Moran, 2000). Within this context, there are some roles that teachers must undertake. Teachers should develop supportive relationships with students and between students, build an environment where students can learn in the best way, include group work that will encourage student participation, support students' development of social and self-regulation skills, and display appropriate approaches toward students with behavioural problems (Evertson & Weinstein, 2006). It is understood from all these explanations that classroom management is a complex and multidimensional phenomenon.

Classroom management is often defined as an area where teachers assume one of the most challenging roles and constantly report a need for additional training and support (Reinke et al., 2011). In global-scale evaluations as well, the issue of student behaviours and classroom management is both given a great deal of attention and regarded as highly essential in professional development (OECD, 2019). This situation can be explained by the fact that even if teachers have attended training on classroom management, they often report a need in this sense for more support with the aim of developing themselves further. It is of critical importance to ensure teachers' roles are up to date in order to adapt to the increase in diversity and multiculturalism in society, the development of knowledge, and the increase in the opportunities to access information (Thomas & Beauchamp, 2007).

The Covid-19 pandemic affected education all over the world and required teachers to urgently adapt themselves to online learning and teaching environments (Hargreaves & Fullan, 2020; Stamatis, 2021). Teachers faced some unpredictable difficulties while trying to adapt to online learning unprepared (Choi et al., 2021). At the beginning of the process, the fact that teachers were not very familiar with online teaching was a challenging factor (Feriver & Arık, 2021; Gudmundsdottir & Hathaway, 2020; Marshall et al., 2020; Trust & Whalen, 2020). In addition, teachers experienced difficulties in performing professional duties such as lesson planning, assessment of learning, communication with parents, and differentiated instruction in the online environment (Marshall et al., 2020). While teachers in some schools were able to conduct their lessons online since their students had access to the necessary technology, their home environment was supportive, and the classroom sizes were large enough to manage on a digital platform, some other teachers in other schools struggled to reach students and their parents (Hargreaves & Fullan, 2020). In this sense, according to the school principals participating in the study carried out by Hamilton et al. (2020), the most frequently cited restrictive factors were students' lack of internet access, difficulty in providing equal education for all students, and inability to communicate with students and families in distance education. Social distances between teachers and students also affected the management of the learning process. According to Hattie (2009), teachers' timely feedback and formative assessments during the teaching process had the greatest impact on academic outcomes. On the other hand, although autonomous learning by students is considered important, Hattie's analysis, in which the effect size was found to be very low, showed that a learning process controlled by students themselves is not likely to be an effective way to influence academic outcomes. Moreover, the fact that the learning process of the students was largely their own responsibility during the period when the schools were closed could not provide the desired progress in cognitive development and outcomes.

Effective classroom management skills are already essential under normal circumstances, but in cases of major crises such as pandemics or natural disasters, the typical functioning of schools is disrupted. Such conditions necessitate the transition to distance education, making classroom management skills even more critical for several reasons (Goldman et al., 2021). For instance, new challenges appear in the way teaching practices and student behaviours are managed (Lohmann et al., 2021). While reducing undesired student behaviours and ensuring student participation and motivation have been effective classroom management practices employed by teachers (Gage et al., 2018), there emerges a need for more innovative approaches together with the new conditions (Lathifah et al., 2020). As observed during distance education, younger students started to be more unwilling and uninterested in regarding participation in the learning process and found the process boring and meaningless (Stamatis, 2021). Issues related to the implementation of rules and behavioural expectations can be considered other classroom management factors that have caused difficulties during this process.

In the post-pandemic period, in order to close the gap that occurred in success levels to a great extent, academic support stands out as a solution. Nevertheless, the pandemic showed us that inequalities beyond classes also need to be given considerable attention. These inequalities include parental support, home environment, access to learning resources and mental health problems (of children or their families), exposure to violence, negligence and abuse, bereavement, and nursing responsibilities. This requires collaborative work to remove barriers to learning (Quilter-Pinner & Ambrose, 2020). While managing this process, it has become more critical for teachers to establish greater communication and interaction with students, to focus on social support, and to encourage family participation. This is because, according to Stamatis (2021), communication between teachers and families is a crucial factor that determines the quality of the learning process.

Teachers have been adversely affected by this process (Cardoza, 2021; Hargreaves, 2021; Jones et al., 2022; Weale, 2020). It is thought to be caused by both the uncertainty created by the epidemic conditions and the frequent changes in the decisions taken regarding education. However, it is seen that the voices of the teachers are not heard enough in the public sphere and the studies on the experiences of the teachers are limited (Aktaş Salman et al., 2021). Within the scope of the Education Monitoring Report, the focus was on how teachers were affected by the pandemic conditions. In the present study, we focused on the difficulties that teachers faced in the classroom environment after the transition to face-to-face education, and revealed the changes observed in students' behaviours and the reflections of these changes on the classroom environment.

METHOD

Research Model

The study was designed as a case study. The fact that the research questions include 'why' and 'how' questions and that in the study the focus was on a contemporary phenomenon, namely post-Covid 19 classroom management, led to the adoption of this design (Yin, 2018). Hays (2004) draws attention to the importance of detailed description in case studies and focuses on understanding events, facts, institutions, or people and explaining their effects (Seggie & Bayyurt, 2015). The current research was carried out with research questions aiming to find out what kind of change occurred in student behaviour after the Covid-19 pandemic, why this change occurred, and how teachers acted during this process. The first and most important condition to identify the research method is to classify the type of research question asked, and some perception-based studies are also based on qualitative evidence (Yin, 2018).

Participants

Since the Covid pandemic, teachers have shared their thoughts on this period in postgraduate education, seminars, and conversations with other teachers. Teachers who observe changes in student behaviours and perceive this as a problem constituted the study

group of the research. The study group consisted of 16 teachers working in primary, middle, and high schools in the 2021-2022 academic year and who voluntarily participated in the research. The participants were informed about the study. Five of the participating teachers work in primary schools, five in middle schools, and six in high schools. The demographic characteristics of the teachers are presented in Table 1.

Table 1

Demographic Characteristics of Teachers

Code	Gender	Level	Branch	Teaching Experience
T1	Female	Middle School	Turkish Teacher	19 years
T2	Female	Primary School	Class Teacher	21 years
T3	Female	High School	History Teacher	14 years
T4	Female	Primary School	Class Teacher	14 years
T5	Female	Middle School	Turkish Teacher	10 years
T6	Female	Middle School	English Teacher	9 years
T7	Female	Middle School	Religious Culture and Moral Knowledge Teacher	7 years
T8	Male	Primary School	Class Teacher	16 years
T9	Female	Primary School	Class Teacher	19 years
T10	Female	Primary School	Class Teacher	24 years
T11	Female	High School	English Teacher	6 years
T12	Female	Middle School	Mathematics Teacher	13 years
T13	Male	High School	English Teacher	17 years
T14	Male	High School	Mathematics Teacher	28 years
T15	Male	High School	Physical Education Teacher	14 years
T16	Male	High School	Information Technologies Teacher	20 years

Data Collection

The data of the study were collected through a semi-structured interview form developed by the researchers. While preparing the research questions, the dimensions of classroom management were taken into account. The interview questions were prepared by reviewing the literature and previous studies. The questions were peer-reviewed before use. The remaining four questions were arranged in terms of meaning and the interview questions took their final form. One of the researchers had a preliminary interview with two teachers, and on reaching the conclusion that the questions were intelligible, the interviews were started. The teachers were asked the following interview questions:

1. What kind of changes did you observe in students' behaviours during the transition to face-to-face education after the pandemic?

2. How did these changes affect your classroom environment?

3. What/Who do you think is the cause(s) of this change in students' behaviours?

4. What kind of strategies do you use while managing this process in terms of classroom management?

The interviews were conducted online and recorded using the recording software on the computer. The dates and times of the interviews were arranged according to the availability and preferences of the teachers. Before the interviews, the teachers were given detailed information about the purpose and scope of the study. They were also informed that their names would be kept confidential and that codes would be used to refer to the teachers instead of names in the study. The interviews were recorded once the consent of the teachers was obtained. The duration of the interviews varied between 16 and 27 minutes.

Data Analysis

The data recorded in the interviews were transcribed manually word by word in Microsoft Word and a dataset of a total of 52 pages of consisting of 13234 words was obtained. The consistency of the video recordings with the written data was checked by the researchers and spelling mistakes were corrected. The data were prepared for coding. The data of the study were analysed by content analysis. In content analysis, content is coded as data in a form that can be used to address research questions and any material collected in the study, which can be referred to as the records of the study, is transformed into data through coding (Lune & Berg, 2017: 182).

First of all, the data were coded separately by both researchers. Then the researchers came together and evaluated the codes. No action was taken for the data they gave the same codes to. Codes that expressed similar or the same meanings were combined and it was agreed on the code that would best reflect the situation. Duplicate or unnecessary codes were removed. For example, cognitive regression, forgetting the rules, technology addiction, violence, family indifference, weakness in movements, communication problems, bullying, and individualisation were the accepted codes. Then the researchers came together again and the categories they created were evaluated and these categories were combined and gathered under the draft themes. The generated codes, categories, and themes were sent to an expert in the field of educational sciences. In line with the feedback from the experts, the categories and themes were finalised. For an overview of the coding, refer to the results section.

Ethical considerations

In order to ensure the validity and reliability of the study, attempts were made to achieve the credibility (in preference to internal validity), transferability (in preference to external validity/generalisability), dependability (in preference to reliability), and confirmability (in preference to objectivity) criteria suggested by Guba (1981). In order to ensure credibility, the demographic information related to the teachers was given in detail. In addition, expert opinions were obtained during the development of the interview questions and the creation of categories and themes. In order to ensure transferability, the

data were transferred through detailed description, and direct quotations from the views of the teachers were included. In order to ensure dependability, expert opinions were utilised, as mentioned before. In addition, the fact that two researchers created the codes separately, discussed the issues on which they differed, and reached a consensus is an indication that dependability was achieved. For confirmability, the transcript of each teacher's video recording was shared with the relevant teacher participating in the interview and the participant's confirmation was obtained. In addition, all the video recordings, written documents, and the other documents studied during the analysis process were kept (Guba & Lincoln, 1982; Shenton, 2004; Miles & Huberman, 2016).

In the present study, all rules that are required to be followed within the scope of the "Higher Education Institutions Scientific Research and Publication Ethics Directive" were followed. None of the actions listed under the title "Actions Against Scientific Research and Publication Ethics", which is the second part of the directive, were taken.

Ethical review board name: Pamukkale University Social and Human Sciences

Scientific Research and Publication Ethics Committee

Date of ethics review decision: 29.12.2021

Ethics assessment document issue number: 68282350/22021/G025

RESULTS

In this section, the findings obtained in line with the purpose of the study are presented under the headings of changes observed in students' behaviours after transition to face-to-face education, the causes of behavioural changes, and the strategies followed by teachers in terms of classroom management.

Findings concerning changes in students' behaviours after the transition to face-to-face education

Changes observed in students' behaviours after the transition to face-to-face education were discussed under the themes of cognitive changes, motivation and concentration problems, social changes, discipline problems, and psychomotor changes, and the findings are presented in Table 2.

Table 2

Changes in students' behaviours after transition to face-to-face education

Themes	Categories
Cognitive Changes	- Learning problems - Comprehension problems - Level differences among students - No visible difference between grades - Decrease in vocabulary capacity - Disposition to exert minimal effort

Motivation and concentration problems	- Decrease in motivation
	- Unwillingness
	- Concentration problems
Social changes	- Individualisation
	- Socialisation problems
	- Addiction to technology
Disciplinary problems	- Problems related to the rules/order
	- Undesired behaviours
Psychomotor changes	- Increased mobility during lesson
	- Limited and slow movements
	- Weakness and regression in psychomotor skills

Cognitive changes

According to the teachers, after the transition to face-to-face education, students experienced cognitive problems such as learning difficulties/disabilities and learning loss. For instance, T14 put it in the following way: *"In learning and comprehending…, when they first came back, they had difficulties just like those who had just learned to walk. Their eyes looked empty."*, while T15 reported that *"I observed that the students had forgotten most of the information and were having learning difficulties…"* The teachers stated that the students had regressed in their thinking, perception, reasoning, and reasoning skills, and they had problems such as inability to concentrate and understand what they read. This was exemplified by T10's statement: *"…some students have completely lost their listening and watching skills; we had a lot of trouble."* and T16 added that *"Comprehension problems started to appear more. There are problems in their ability to imagine the abstract expressions that are taught..."* Another issue highlighted by the teachers under the theme of cognitive changes was level difference observed between the students. The teachers drew attention to the cognitive differences between students who attended online courses and those who did not during distance education. Regarding this situation, T3 disclosed that *"…The difference between the students who were transferred directly to the next class by the Ministry of National Education and the students who attended the regular online courses is at a serious level. We observed this clearly in the first exams of the term. There are students who got 100 and students who gave blank papers together in the same class..."*, while T8 put it in the following way: *"There occurred great cognitive differences between the students who attended the online courses and those who did not. While most of the participants who attended the online courses could read, write, understand, and do mathematical operations, those who did not attend could not learn to read and write. For this reason, our classes are like multigrade classes"*. The teachers also reported that transition between the grades was not noticed during this process. T7 explained this situation as follows: *"…that is, the outcomes to be achieved in primary school are really essential. Well, now the situation seems as if children passed from 3rd to 5th grade. Since there is knowledge that children cannot obtain in the school environment, we also saw this as a deficiency."* Another behavioural change noted under this theme was the decrease in students' vocabulary capacity. T5 elaborated this situation with the following statement: *"…they read fewer books. However, I think they should have read more… This actually caused a decrease in their vocabulary. In other words, while students at this age should*

normally know more idioms and proverbs… now there are idioms or proverbs that they have never heard of." The teachers also revealed that students got used to high grades during the pandemic, and together with this they began to display a disposition to exert minimal effort. For example, T1 explained this situation by saying: *"Another cognitive loss stemming from the pandemic was students' being able to achieve high grades without effort, since many students were given high grades because of the concern to ensure equality (for those without internet and technology sources). Many students got grades they didn't deserve. This year, they couldn't accept the grades they received in the real exams. They wanted to maintain the same situation and sustain their effortless achievement."*

Motivation and concentration problems

In the opinions of the teachers, the students were also observed to have changes in their motivation and concentration levels after the transition to face-to-face education. Some of the teachers argued that there was a decrease in the students' motivation levels. T6 expressed her views by saying: *"The children seem to have run out of life energy. They look indifferent. They are like ghosts… they have no enthusiasm or life energy any more like they did in the past."* and T12 added that *"… participation in the lesson has decreased a lot. While the 7th grade students, who were in the 5th grade the year the pandemic started, used to compete to solve problems, now they prefer to be passive listeners rather than participating in the lesson."* Another behavioural change specified by the teachers under the theme of motivation and concentration was students' unwillingness. According to the teachers, students were reported be unwilling in writing, doing homework, participating in the lesson, group work, and physical activities. While T3 underlined the issue of unwillingness by stating that *"I observe unwillingness to write…"*, T4 maintained that *"They didn't want to do the homework. Afterwards, most of the students were observed to display behaviours such as breakaway from the education process, unwillingness, and indifference."* The teachers also touched upon the issue of concentration problems. To give an example, T3 remarked that *"I have difficulty in getting the attention of the students for 40 minutes"*, while T11 stated *"…having difficulty in focusing on lessons, they are highly distracted…"* T13 also drew attention to this situation by saying *"There are quite a lot of concentration problems…"*

Social changes

Changes observed in students' behaviours within the scope of social changes were gathered under three categories: individualisation, socialisation problems, and addiction to technology. In terms of individualisation, the teachers stated that they observed changes in students such as inability to empathise and an increase in self-centeredness. T12 expressed this situation as follows: *"… they almost forgot how to establish healthy communication; dissatisfaction and selfishness have increased."* Another category under this theme is socialisation problems. T2 exemplified some socialisation problems through the following expression: *"Communication problems with friends and other teachers, tendency for violence, inability to start or continue a game together, panic and fear, dependence on family, inability to carry*

out group games and activities…" On the other hand, T9 explained the situation by saying "*they could only reconcile and play games with each other after a period of at least 3 months.*". The teachers also pointed out the addiction of the students to technology. T12 explained the negative effects of technology addiction in terms of social aspects with the following statement: "*Students have addiction to their tablets and mobiles. Children who once competed to get a ball or find a goal or playing area during break times now sit and talk about the games they play or are going to play on their tablets or mobiles.*"

Disciplinary problems

In the teachers' opinions, several problems were observed in students' behaviours related to the rules such as not obeying them and forgetting them. This situation was described by T1 by the following expression "*…the children seemed to have forgotten all the classroom rules… School was like virtual reality for them.*" Another point emphasised by the teachers under the theme of disciplinary problems was undesired behaviours. The teachers reported an increase in disrespect in students, trouble in addressing the teacher, negative behaviours as a result of increased sexual interests, watching inappropriate content, tendency for violence, and some unfavourable behaviours in the classroom after the transition to face-to-face education. The situation can be easily understood from T1's statement: "*There were actions including having conversation among themselves, resorting to violence, not being able to follow the lesson, and displaying disproportionate behaviour during breaks*" and from the following expression by T4: "*Negative behaviours such as speaking/interrupting without getting permission, interrupting the speaker, and arguing have appeared more in the classroom environment.*" and T6 added "*And the tendency for violence is observed to have increased a lot, because of the series they watch…*"

Psychomotor changes

This theme consists of three categories: increased mobility in the lesson, limited and slow movements, and weakness and regression in psychomotor skills. During this process, the teachers emphasised that the students' mobility increased during the lessons. T6 expressed this by stating: "*They do not know how to sit in the classroom. They always put their feet on the desk. They constantly move.*" In contrast to this finding, some teachers mentioned limited and slow movements among the students. T16 expressed this situation as follows: "*Students got used to moving less during the pandemic and studying in front of the screen. For this reason, it is observed that they tend not to leave the classroom even during breaks. They do not want to participate in activities that involve movement during the lesson.*" Some weakness and regression were also observed in students' psychomotor skills by the teachers. Under this category, the teachers underlined issues such as weakness and regression in students' hand skills, weakness in muscles, and problems and regression in writing skills. For example, T7 described the regression in students' writing skills with the following explanation "*…we waited maybe half an hour for what they would normally write in 10 minutes. Their writings look really bad; they have really deteriorated.*"

Findings on the perceived causes of the changes observed in students' behaviours

According to the teachers, the perceived causes of the changes observed in students' behaviours after face-to-face education are collected under the following four themes: family, the Ministry of National Education (MoNE), being away from school, and use of technology. The categories under these themes are presented in Table 3.

Table 3

Perceived causes of the behavioural changes in students

Themes	Categories
Family	- Indifference of family
	- Assumed role of the family as a teacher
MoNE	- Distance education policies and practices of the MoNE
Separation from school	- Being away from school
	- The inefficiency of distance education
Use of technology	-Uncontrolled use of technology

Family

Among the causes of the behavioural changes in students, the teachers drew attention to the indifference of families to distance education. T10 explained this situation as follows: *"because the families didn't show sufficient interest and support for their children's participation in distance education..."* Another reason stated in relation to the theme of family is that families assumed the role of teachers. In this regard, T4 said, *"During distance education, parents had to take on the responsibilities of teachers, along with their roles as parents, such as following lesson schedules, checking homework, etc. This situation created problems on both sides and, after a while, led to the emergence of challenges, deficiencies, and tension".*

MoNE

According to the teachers, another reason for the changes in students' behaviour was the policies and practices carried out by the MoNE during distance education. T13 attributed the different behaviour to some changes to the policy of the MoNE regarding students' attendance in lessons in the following way: *"Because the ministry didn't take student absenteeism into consideration during the pandemic, and students realised that they could pass the class without attending the classes."* Another situation highlighted by the teachers about the policies and practices of the MoNE was the constant changes in practices. Regarding this situation, T3 expressed her views by saying *"because of the ever-changing practices of the MoNE… practices such as students' passing the grade without an exam, creating no obligation for students to attend online courses, and preventing students from opening the cameras (so they were engaged in other activities during the lesson) have caused them to have the perception that they could pass the grade somehow."*

Separation from school

Separation from school was also a reason for the behavioural changes seen in students. Under this theme, the points highlighted were students' being away from school and the inefficiency of distance education. The explanation of T15 regarding the category of being away from school is as follows: *"The main source of this change is definitely the fact that students have been away from school for such a long time."* T10 also expressed this situation in the following way: *"Student fulfill the first step of attendance by coming to school every day. Then by doing the same things every day in lessons, studies, rules, etc., the behaviour is reinforced and becomes settled. However, it was not possible in distance education."* Considering the inefficiency of distance education, T11 expressed her views with the following statement: *"The reason for this change is that students were not able to focus on the lessons as in the classroom and couldn't adequately learn new subjects during distance education."*

Use of Technology

Uncontrolled use of technology appeared as one of the reasons for the changes in students' behaviour. T5 explained this issue by maintaining *"…because of the videos and Netflix series they watch, they constantly talk about them, because the children are familiar with many of the TV series and movies that I have never even heard of, and they watch them although they are inappropriate for them and their age group."* Similarly, T7 emphasized that students use technology uncontrollably and said *"Because, as far as I understand, they were so engaged with computers. They spent a lot of time alone at home. Even after the online courses were over, they continued to play games and watch videos."*

Findings on the strategies followed by teachers in terms of classroom management

The findings regarding the strategies followed by the teachers in terms of classroom management while managing the process after the transition to face-to-face education are collected under four themes: management of teaching, behaviour management, management of relationships, and management of the physical environment. The categories related to these themes are presented in Table 4.

Table 4

Strategies followed by teachers in terms of classroom management

Themes	Categories
Management of teaching	- Revision of previous lessons - Being flexible - Diversifying methods, techniques, and materials - Encouragement for participation - Keeping expectations low
Behaviour management	- Being authoritative at the beginning - Being understanding

	- Monitoring students
	- Using the reactive model
	- Setting clear rules
	- Reintroducing lesson routines
	- Describing desired behaviours
Management of relationships	- Special/individual attention to the student
	- Managing the process through communicating
	- Ensuring socialisation
	- Communication with parents
	- Cooperation with the guidance & counselling service
Management of physical environment	- Change in seating arrangement

Management of teaching

In terms of classroom management, while managing the teaching process, the teachers mentioned that they revised previous lessons; provided flexibility for students; diversified the methods, techniques, and materials they used; tried to encourage students to participate in the lesson; and kept their expectations low. T11 expressed her views on revising while managing the teaching as follows: *"I revise previous lessons during the courses very often as the students fell behind due to the attendance problem during online education."* The teachers also stated that they were more flexible during this process. The explanation by T8 regarding this situation is as follows: *"I allow those who cannot complete the activities to have extra time or get help from their peers."* Some of the teachers reported that they used different methods, techniques, or materials more while managing the process. For example, T10 explained this situation by saying, *"I intended to change student behaviours through providing various contents such as cartoons, presentations, and videos on the necessity and correct use of technology for about one-one and a half months with interdisciplinary transitions during the themes of Turkish-Science-Technology, Social Studies."* and T11 said, *"I increased the methods and techniques I used in the classroom. I use various techniques to get the students' attention."* In addition, the teachers underlined the effort they made in order to get students to participate in the lesson. T5 explained how she tried to involve her students in the lesson by stating *"…the child is right there and my idea is that I should include him in the lesson. Whether a student is hardworking or not, or even if he doesn't know the subject, we tried hard to encourage his participation; I can say that we have become a little more conscious about participation in the course and self-improvement."* The teachers also noted that they kept their expectations from students low. Regarding this category, T4 expressed her opinion by saying *"In terms of classroom management, I have always considered the developmental disruptions caused by students' being away from school for a long time. I approached them by regarding them one grade below their grade level."*

Behaviour management

The teachers reported having benefited from some behavioural arrangements to create desired behaviours in students. Considering behaviour management, some teachers stated that they exhibited an authoritative approach at first. T1 explained this by saying *"I had to behave more strictly and more authoritatively in the first few months."* Some teachers, in contrast, stated that they were more understanding. T14's statement regarding this situation is as follows: *"We are trying to show more patience and attention, guide them, and increase their motivation."* Under this theme, the teachers also mentioned that they monitored students, displayed a reactive classroom management approach, set the rules clearly, tried to reintroduce the routines of the lessons, and described the desired behaviours to the students. Some of the teachers' views on these categories are given below.

T12: I need to more closely monitor whether the tasks assigned are fulfilled or not.

T9: I reinforce positive behaviours. I give stickers, say 'thank you'… I show my reaction to those who insist on their negative behaviours by sulking, warning, etc.

T16: We began to set the rules more clearly. We are now trying to describe the rules and guide students, even in matters where we don't need to or in the rules which we already expect students to obey.

T3: There is a regression in the habits in which they had no difficulty before, such as bringing the course materials to the class, preparing for the lesson, coming to the lesson on time, and doing the assigned homework. It is my priority to ensure students regain these habits.

T16: We try to describe to students the behaviour patterns that are desired so as to replace the negative behaviours.

Management of relationships

One of the issues that the teachers mentioned concerning the theme of relationship management is about showing individual attention to students. T3 explained this situation by saying *"I especially began to motivate and deal with the students who took a dislike to school and are unwilling to come."* The teachers also emphasised that they managed this process through communication/interaction. Regarding this situation, T7 said, *"Afterwards, I tried to deal with the undisciplined behaviours in the classroom through communicating with students. We don't have any other option. We tried to deal with it by communicating. We had a chat. You know, we talked about what they did or how it should be in the classroom."* Some of the teachers also stressed that they tried to ensure the socialization of the students. T5's following statement supports this: *"…I can say that we try to keep the social environment as enjoyable as possible. I can also say that we make more effort to spend more time with our students and with each other. Again, we try to do our activities face-to-face as much as possible. We have increased our meetings with students. In the evenings, we sometimes come together and play games with them. We organise different activities with our own class students."* Under this theme, the teachers mentioned that they increased communication with parents. For example, T12 reported: *"I communicate with parents more*

than ever, and I try to understand the causes of the problems at school and ask for their support in solving them." Finally, it can be understood that the teachers work in cooperation with the guidance and counselling service from the following statement by T4: *"I get help from the school's guidance and counselling service when necessary."*

Management of the physical environment

In this context, the teachers changed the seating arrangement in the classroom. T2 exemplified this situation by saying *"I often changed the seating arrangement."*

DISCUSSION and CONCLUSION

Together with the transition to face-to-face education, students were observed to exhibit cognitive, social, and psychomotor changes in their behaviours in the classroom environment as well as motivation and concentration problems and discipline problems. From a cognitive point of view, not all students had similar experiences during the period when schools were closed. It was suggested that the lack of full participation during distance education due to the diversity in the circumstances of the families (Dabrowski, 2020; Xie & Yang, 2020) would bring about differences in the knowledge levels of the students when face-to-face education was introduced again (Munawaroh & Nurmalasari, 2021; OECD, 2020; The World Bank, UNESCO and UNICEF, 2021; Yaşar, 2021). It is predicted that the learning loss due to the pandemic will be between 1/3 and 2/3 of a year (Feriver & Arık, 2021). This situation, in fact, occurred according to the opinions of the teachers, who stated that there were level differences between the students. Moreover, this situation caused students to experience learning problems and led to restructure of the learning process (Page et al., 2021). It is thought that teachers will give priority to making up for learning losses during the process of reopening schools (Kocabaş et al., 2021; ÖRAV, 2020) since one of the situations that teachers worry about is the decrease in the academic achievement levels of students (Bayindır, 2021). It was observed that students moved away from the criteria determined for measurement and evaluation, and they expected to achieve high grades without effort. This can mean that students developed the perception that they would somehow move to the upper class or graduate and that they devalued education. Likewise, one of the teachers who participated in the study conducted by Marshall et al. (2020) stated that not all students actively participated in distance education, but all of them got the highest grades. Furthermore, Yeşilyurt (2021) concluded that the level of validity and reliability in measurement and evaluation during distance education was lower than that of the measurement and evaluation performed during face-to-face education. The fact that the criteria for the assessment and evaluation of students could not be determined created challenges for the teachers and resulted in the problem of grade inflation due to concern about injustice among students or because of various pressures felt (TEDMEM, 2022).

In the present study, the findings indicated that there have been perceived social changes in students' behaviours. It has been understood with the Covid-19 crisis that school not only fulfils its educational mission within the framework of conveying knowledge, but also meets the socialisation needs of individuals (Colao et al., 2020; OECD, 2020; The World Bank, UNESCO and UNICEF, 2021; Wang et al., 2020). Moreover, during this process, children had to be away from the areas where they would possibly socialise with each other (Colao et al., 2020). Therefore, it has been noted that the school environment serves as a social learning area and an area for children to acquire social skills (Stamatis, 2021). It was observed that the individuality of students increased and they had problems in socialization since they were away from school. According to other studies, students are expected to experience difficulties in terms of social interaction in face-to-face education after the pandemic (UNESCO, 2020; Yaşar, 2021). To overcome these challenges, schools can offer strong support for the development of social relationships. Most importantly, schools also host social relations. In fact, teaching and learning are related to human interactions, mutual communication, and change (International Commission on the Futures of Education, 2020). Moreover, out-of-class activities rather than in-class teaching practices are becoming more important (OECD, 2021).

It was also found in the present study that there were some differences in students' behaviours in terms of psychomotor skills. Students' inability to stay still during the lesson and their constant movement were among these behaviours. During the pandemic, children thought that they needed to move around inside the house and sought reasons to get out of their chairs (Stamatis, 2021). It is evident that children need movement, play, and active learning (OECD, 2020). The fact that children had to spend a long time at home, that they had the freedom to move around at home as they wished, and that they did not feel any obligation to sit down even during the lessons was shown by increased mobility in the classroom environment. In addition, there was a weakening or even regression in students' psychomotor development and movements. Korkmaz et al. (2020) stated that 65% of secondary school students had reduced physical activity levels during the Covid-19 pandemic. Consequent inactiveness that started in this period and continued in the normalisation period was observable.

Motivation and concentration related problems in students became more evident. During distance education, students found it considerably difficult to focus on the computer screen and stay silent for a long time. Therefore, they were able to find many reasons to distract themselves (Stamatis, 2021). Accordingly, during the process of adaptation to school after the pandemic, a decrease was expected to occur in the attention span and motivation levels of the students (Yaşar, 2021). It was regarded as necessary to enhance the adaptation of students and strengthen their motivation upon returning to school (Emin & Altunel, 2021), since the emotional states and motivation levels of everyone, including teachers, students, and parents, were influenced negatively during the pandemic (ÖRAV, 2020). Together with the transition to face-to-face education, disciplinary problems also emerged.

In particular, there was an increase in the problems related to the execution of the rules and in students' undesired behaviours. For example, an increase was observed in violence (UNESCO, 2020). It can also be stated that teachers should be prepared for a different student profile than before the pandemic, since most of the students already got used to distance education and become estranged from school and routines (Kocabaş et al., 2021).

Teachers think that the sources of behavioural change in students are the family, MoNE practices, staying away from school, and using technology. One of these reasons is seen as the management of the process by the top management. There were some problems faced in ensuring coordination in the decision-making processes regarding the opening and closing of schools in Turkiye. Further, the declarations of the MoNE included inconsistent and contradictory decisions, which resulted in last-minute changes (TEDMEM, 2022). The uncertainty caused by constantly changing information from the MoNE and educational institutions as well as insufficient communication raises anxiety in individuals (Bozkurt et al., 2020). On the other hand, building a stronger education system that is well prepared for future risks is possible with a long-term improvement plan that takes advantage of innovations in education and focuses on equal opportunities (The World Bank, UNESCO and UNICEF, 2021). During the period when the students were away from school, the role of families gained a little more importance. One of the sources of changes in students' behaviours is parents' assuming the role of a teacher. Families played a critical role in shaping what, when, and how children learn, and the importance of family involvement in the process was emphasised (Bozkurt, 2020; ÖRAV, 2020; Quilter-Pinner & Ambrose, 2020; Stamatis, 2021). It is of great importance for parents to continue to be interested in their children, who returned to face-to-face education after the pandemic (Kocabaş et al., 2021). On the other hand, students who did not receive parental support at home also had difficulties in accessing digital learning resources (Colao et al., 2020). The increase in the use of technology was one of the sources that caused changes in students' behaviours. Especially with the Covid-19 pandemic, a significant increase was observed in digital activities and screen time (Saxena et al., 2021). In addition, students spent more time in digital environments with less supervision and control (OECD, 2020). According to the findings of research on children's use of technology, the rate of internet use by children was 82.7% in 2021. In addition, 35.9% of children in the 6-15 age group reported that they read fewer books as they spent more time in front of the screen (TUIK, 2021).

As for the strategies applied by the teachers regarding classroom management after face-to-face education, the first one is related to the management of teaching. During this process, the teachers mentioned that they revised previous lessons due to the learning deficiencies and losses in order to close the gaps. Indeed, according to a recent analysis of the approaches to address learning losses, it is seen that the focus is on "the removal of the gaps" or "re-establishment of learning" (Anderson 2021; cited in Reimers, 2021). Cullinane and Montacute (2020) stated that when schools return to the normal process, make-up or support lessons should be provided for children with learning deficits in addition to normal

lessons or during the summer months. The underlying reason is that the disadvantaged students were likely to fall behind their advantaged friends during school closures (cited in Balcı, 2020). The teachers emphasised that they benefited from different methods, techniques, and materials during this process. Learning losses during the pandemic required schools and teachers to re-evaluate students' knowledge and skills when they returned to school. This obliges educators to devise curriculums adjusted according to students' levels and to develop appropriate individualized methods to support students (Reimers, 2021). The teachers also stated that they attempted to attend to students actively in the lessons. One of the five scientifically proven classroom management practices put forward by Simonsen et al. (2008) is to ensure active participation of students in the lesson. They have indicated that teachers can increase active participation by increasing students' opportunities to respond, using direct instruction techniques, applying peer instruction, using computer-based instruction, and providing guided notes. Active participation in lessons creates opportunities for students to learn and apply new knowledge and strategies, to explain their reasoning, to examine their thinking processes, and to recognise the need to review thinking. It also provides teachers with a window into students' thinking processes and learning, allows them to diagnose learning problems or assess student progress, and offers teachers the opportunity to build a structure for students' understanding or provide cognitive and affective support (Turner & Patrick, 2004).

Another strategy used by the teachers to prevent students' undesired behaviours and create desired behaviour change is related to behaviour management. Under this theme, the teachers stated that they employed the reactive model. Most of the teachers mainly use reactive applications to control student behaviour. Moreover, using preventive approaches in classroom management is associated with increases in student participation and improved teacher well-being (Hepburn et al., 2021). Clunies-Ross et al. (2008) revealed that the use of predominantly reactive management strategies is significantly related to increased teacher stress and decreased student task engagement. In addition, the teachers underlined that they set clear rules in the classroom. In fact, it was found that certainty in the classroom is positively related to student achievement, participation level, and student satisfaction (Hines et al., 1985; Shindler et al., 2009; cited in Shindler, 2010).

While the teachers were managing this process, they also gave importance to the management of relationships as a classroom management strategy. The teachers noted that they showed attention to students individually and tried to manage the process with communication. In line with this, there have been numerous studies indicating that students' academic achievement and productive behaviours are affected by the quality of the teacher–student relationship (Archambault et al., 2017; Hughes, & Kwok, 2007; Konishi et al., 2010; Niebuhr & Niebuhr, 1999). Establishing caring relationships between teachers and students is crucial. Developing effective communication is a challenging but vital step in building caring and functional interactions within the classroom. When students feel that a teacher cares about them, they regard the teacher as a trustworthy ally rather than an

enemy. This situation increases students' motivation to follow the instructions, obey the rules, and exert effort during classroom activities (Elias & Schwab, 2011). Increasing communication/interaction with parents was stated to be another effective strategy applied by the teachers. Classroom management and teaching will be more effective when families are actively involved in their child's education, as they are critical sources of information on topics such as students' interests, learning styles, and learning backgrounds. As long as teachers view parental involvement as an educational resource and know how to take advantage of it, student learning and motivation will increase (Walker & Hoover-Dempsey, 2011).

LIMITATIONS AND RECOMMENDATIONS

Our study had some limitations. First, the data were collected through online interviews. The second was the diversity that we tried to provide within the scope of the teaching experience of the participants. Teachers with 5 years or less experience were not included in the research. The less experienced teachers did not want to participate in the research because of their workload.

Some suggestions have been developed within the scope of the research results. It has been observed that there have been significant changes in student behaviour in recent years. These changes are reflected in the school environment, classroom environment, family environment, and social environment. Therefore, it is thought that there is a need for studies focusing on this subject. Similar research can be considered in detail in different types of schools. In addition, studies involving students, parents, and school administrators can provide different perspectives.

Considering the cognitive experiences of students, additional support should be offered within the scope of schools to eliminate learning losses. It may be necessary to review lesson plans to reduce problems with motivation and concentration. Game-based and technology-supported activities can be prepared that can be applied during the introduction to the course and during the period. One of the most important issues during the period of being away from school has been socialization. Projects in which students can work and collaborate can be developed. Social and sportive activities, club activities, and competitions can be organized and socialization of students can be emphasized. In this way, students' psychomotor skills can also be supported. Informative training can be given to students and families regarding the correct use of technology. Rules for the management of behaviour should be clearly defined and reinforced. It is thought that a communication-oriented approach to students will provide mutual benefits.

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Research Article

Adapting the Survey of Technological Pedagogical STEM Knowledge to the Turkish Language and Determining the Knowledge of Pre-service and In-service Teachers [1]

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Abstract:

The purpose of this study was to adapt a survey developed by Chai, Jong et al. (2019) on technological pedagogical STEM (TP-STEM) knowledge into Turkish and to determine the knowledge of pre-service and in-service teachers about TP-STEM. The original survey consisted of four factors and a total of 17 items. These factors included Technological Pedagogical Knowledge in Science (TPSK), Technological Pedagogical Knowledge in Mathematics (TPMK), Technological Pedagogical Knowledge in Engineering (TPEK), and Integrative STEM (iSTEM) knowledge. The participants of the study were 520 pre-service and in-service teachers. The analysis showed that the model fit indices for the validity of the factor structures were acceptable with a value of RMSEA=0.0621 and showed excellent agreement with the values SRMR=0.0346, CFI =0.961, TLI=0.953. The Cronbach's alpha values for the factors ranged from 0.80 to 0.84 (α-value >.70). These results mean that the survey adapted to Turkish language was reliable and valid for further research. The results showed that pre-service and in-service mathematics teachers had lower self-efficacy on the subfactors (TPSK, TPMK, TPEK, and iSTEM) than pre-service and in-service science and computer teachers.

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INTRODUCTION

The only constant in life is change (Heraclitus). Time brings change, and a change in one area can bring about other changes. The need for individuals to acquire new skills over time has led to exploring educational approaches and models that are thought to develop those skills more effectively. In recent years, educational models that integrate multiple disciplines have attracted the interest of scholars (Aranda et al., 2020; Bybee, 2013; English, 2015). The approach STEM, which includes science, mathematics, engineering, and technology, is one of the unique approaches today. STEM Education is mainly expressed as integrated STEM education, which links all disciplines together (Blackley & Howell, 2015). STEM is the integration of knowledge built between the fields of science, mathematics, engineering, and technology (Chai, Jong et al., 2020; Wang & Fan, 2018). Integrated STEM education aims to improve the quality of education of individuals who use science and technology to achieve specific goals and have problem-solving skills in daily life (Bybee, 2013). It is mainly concerned with learners' explorations and problem-solving in everyday life (Bagiati & Evangelou, 2015), encourage their creativity, and enables them to apply the learned information more in other fields (Tseng et al., 2013). It encourages learners to express their thoughts and learn cooperatively with other class students to solve problems requiring knowledge in science, mathematics, engineering, and technology (Kuo et al., 2019). It also aims to provide students with holistic development (Breiner et al., 2012; Smith & Karr-Kidwell, 2000; Tsupros et al., 2009), increase their curiosity and interest in all areas, and promote the production of innovative technologies (Thomas, 2014).

Researchers have pointed out that pre-service and in-service teachers should have specific STEM teaching competencies to conduct effective instruction. Many researchers have pointed out that teaching STEM can pose pedagogical challenges to many teachers, especially if they do not have adequate knowledge in engineering, technology, and design thinking (Chai, Jong et al., 2019; Faikhamta et al., 2020). For example, Akgündüz et al. (2015) found that teachers with inadequate knowledge, experience, and skills related to STEM education negatively affected students' performance in STEM education. Research studies have shown that teachers feel inadequate concerning STEM (Karademir-Coşkun et al., 2020; Köse & Ataş, 2020; Yıldırım & Türk, 2018) and have an insufficient knowledge base because they have not received professional development courses or induction programs for STEM teaching (El-Deghaidy & Mansour, 2015; Hossain & Michael, 2012; Karademir-Coşkun et al., 2020). These studies also showed that teachers lacked technological pedagogical content knowledge (TPACK) related to STEM education (Karademir-Coşkun et al., 2020; Yanış-Kelleci, 2020). From these findings, there is a need for pre-service and in-service teachers to identify and develop their pedagogical competencies related to STEM.

Given that STEM education is an approach that covers the process from preschool to college (Gonzalez & Kuenzi, 2012), it requires that pre-service and in-service teachers need to have a knowledge base and competencies in all areas of STEM. In addition, pre-service

and in-service teachers are expected to implement STEM education in the classroom. From this perspective, it is important to identify and develop the STEM competencies of pre-service and in-service teachers in STEM disciplines. For students in the STEM classroom to be successful, creative, critical thinkers, designers, and producers, teachers must have a certain level of knowledge about integrated STEM education and use technology during their classroom instruction. TPACK is teachers' knowledge of incorporating technology into the classroom (Schmidt et al., 2009). Technology is also an integral part of integrated STEM education. From this perspective, STEM and TPACK have a common element of technology (Chai, Jong et al., 2020). In the current research literature, a few studies examined pre-service and in-service teachers' knowledge and skills related to STEM education and their TPACKs from a holistic perspective (Chai, 2019; Chai, Jong et al., 2019; Chai, Jong et al., 2020; Chai, Rahmawati et al., 2020; Çayak, 2019; Rahman et al., 2017; Wang & Fan, 2018). For example, Dadacan (2021) found that the self-efficacy of pre-service science teachers and classroom teachers regarding STEM instruction was better than that of mathematics teachers. The recent studies by Koçak et al. (2019) and Karışan and Bakırcı (2018) found that the orientations of pre-service science teachers toward STEM were better than those of pre-service and in-service mathematics teachers. In a recent study, Chai, Jong et al. (2019) found that science teachers performed better than pre-service mathematics teachers. Their results also showed that science teachers had higher scores than mathematics teachers in all factors, including TPMK in TPSK, TPEK, and iSTEM.

All of the knowledge and practices inherent in each STEM discipline have complex structures. The interconnectedness of integrated STEM disciplines and practices makes this structure more complex and dynamic (Chai, Jong et al., 2019; Kelley & Knowles, 2016; Wells, 2016). In this regard, useful, reliable measurement tools that determine teachers' or pre-service teachers' TPACKs concerning this complex structure are expected to contribute to the literature. The purpose of this study was to adapt the TP-STEMK survey developed by Chai, Jong et al. (2019) into Turkish language and to determine the self-efficacy level of teachers and pre-service teachers at TP-STEMK. The research questions guiding this study are as follows.

1-) What is the validity and reliability of the adapted TP-STEMK survey in Turkish?

2-) Are there statistically significant differences in the subfactors of the TP-STEM knowledge survey according to the program studied by the pre-service teachers?

3-) Are there statistically significant differences in the subfactors of the TP-STEM knowledge survey according to the branches of the study of the in-service teachers?

Theoretical Background

Teachers' Competencies in STEM Education

Teachers' competencies are one of the most important factors affecting the quality of teaching, motivation, and student achievement (Baumert et al., 2010; Park & Oliver, 2008).

Considering the importance of this factor, it is crucial for the implementation of STEM that teachers have a certain level of STEM content knowledge and skills for teaching knowledge. Research has shown that teachers with insufficient STEM knowledge and skills negatively affect their students' STEM achievement (Çorlu et al., 2014; Williams, 2011) and have positive attitudes toward STEM (NRC, 2013; Dönmez, 2020). For example, El-Deghaidy and Mansour (2015) found that teachers could not reflect the essence of integrated STEM instruction in their classrooms because they could not adopt the technology concept. In another study, Akgündüz et al. (2015) found that high school students could not successfully use STEM technology because math and science teachers lacked experience and knowledge of STEM education. In addition, Moore and Smith (2014) found that teachers in STEM practices focused on teaching science and mathematics and ignored technology and engineering in their instruction. From this perspective, integrating integrated STEM education in the classroom and teachers' participation in STEM-related professional development activities is very important for the implementation and success of integrated STEM education (NRC, 2013; Srikoom et al., 2017).

Teachers' Self-Efficacies in STEM Education

The concept of self-efficacy was first introduced by Bandura (1977). Bandura defined self-efficacy as a person's individual belief in doing something to be successful. Tschannen-Moran and Woolfolk-Hoy (2001) emphasized that by fostering self-efficacy in teachers, they can be trained to be willing teachers who are successful in their profession. In recent research, Chai, Jong et al. (2019) found that teacher self-efficacy has a multidimensional structure. Teachers' self-efficacy affects their performance, teaching practices, and attitudes toward innovative teaching approaches (Deehan et al., 2017). Studies conducted by researchers show that pre-service and in-service teachers with high self-efficacy are very diligent in training and professional development activities (Usher & Pajares, 2008; Pendergast et al., 2011), open to new ideas and technologies, and willing to use technology in the classroom (Charalambous & Philippou, 2011; Lunenburg, 2011; Smith et al., 2012; Tschannen-Moran & Woolfolk-Hoy, 2001). Hacıömeroğlu (2020) emphasized that teachers with low self-efficacy cannot respond to students' needs. For this reason, it is important to determine teachers' self-efficacy and knowledge levels about integrated STEM instruction (Honey et al., 2014).

STEM Education and Technological Pedagogical Content Knowledge

TPACK is teachers' knowledge of how to integrate technology into the classroom. Researchers have highlighted that a knowledge base for teaching shapes teachers' instruction while teaching a subject using technological and pedagogical knowledge (Schmidt et al., 2009). The integrated STEM approach reveals an understanding of educating individuals with knowledge and skills by sharing science, design, production, technological tools, and devices (Directorate General of Private Educational Institutions [ÖÖKGM], 2019). Therefore, integrated STEM is important for understanding teachers' technological

knowledge in curriculum and pedagogy (Lin et al., 2021). The role of technology in strengthening STEM education is emphasized by most educators (Chai, Jong et al., 2019). Specifically, integrated STEM is an integrated knowledge base to improve teachers' TPACK awareness and integration of technology in the classroom (Chai, Jong et al., 2019). Thus, TPACK and integrated STEM complement each other in pedagogical goals and STEM disciplines (Parkeret et al., 2015; Milner-Bolotin, 2018; Chai, 2019). integrated STEM education and TPACK highlight the importance of learning in the 21st century (Chai, 2019; Milner-Bolotin, 2018). In addition, researchers have emphasized that TPACK provides a conceptualized knowledge base for instruction (Chai, Koh et al., 2019). This knowledge base requires teachers to know how to use technology to create STEM out-of-school projects, implement strategies to allow students to participate in online activities (TPB), and use subject-specific computer-based activities (TAB). In this context, it is important to identify teacher self-efficacy regarding STEM and TPACK. However, understanding the relationships between STEM and TBAP will facilitate the development of teachers' knowledge, skills, and pedagogical competencies (Chai, Jong et al., 2019). In this regard, technology integration will increase meaningful learning in the STEM classroom. A limited number of research studies have examined teachers' knowledge, skills, and competencies for integrating STEM and TPACK (Chai, 2019; Chai, Jong et al., 2019; Parker et al., 2015).

Teachers' Knowledge of TP-STEMK

In reviewing the literature, qualitative studies have been mainly used to identify STEM-TPACK -related knowledge of pre-service and in-service teachers. Some studies that have used quantitative measurement tools (Çayak, 2019; Phanprom et al., 2021) are limited. To date, researchers have used different instruments to collect data, including different subfactors of STEM-TPACK measurement. TPACK is a seven-factor model (Mishra & Koehler, 2006). Given that each discipline is in the STEM field and technology, a seven-factor model STEM-TPACK does not seem very practical to use in research. With its practical application, this problem will reduce the usefulness of the data collection tools developed. In this regard, the four-factor survey Chai, Jong et al. (2019) developed is very useful. In this survey, the factors TPSK (Technological Pedagogical Knowledge in Science), TPMK (Technological Pedagogical Knowledge in Mathematics), and TPEK (Technological Pedagogical Knowledge in Engineering) provide information about teachers' competencies in the technologies they use. The fourth factor was named "integrative STEM" (iSTEM) because integrating these factors contains information about teachers' holistic view of STEM education. The same survey developed by Chai, Jong et al. (2019) has been used by many researchers (Love, & Hughes, 2022; Solina, 2021; Barba-Sánchez et al., 2021). In this study, we aimed to translate the survey developed by Chai, Jong et al. (2019) into Turkish.

METHOD

Research Model

This research is an adaptation study of a survey. This type of research involves the process of adapting a survey developed in one language to another language by conducting validity and reliability analyzes (Kılıçer & Odabaşı, 2010; Seçer, 2015). In this study, the TP-STEMK survey developed by Chai, Jong et al. (2019) was adapted to the Turkish language.

Participants

The study group was formed using the "appropriate sampling" method, one of the non-probabilistic sampling methods. Appropriate sampling is a technique with voluntary participants that is easily accessible and applicable to researchers due to time, labor, and cost constraints (Canbazoğlu-Bilici, 2019; Teddlie & Yu, 2007). The participants in the study consisted of 657 pre-service and in-service teachers. Of the participants, 54 were involved in the pilot study, and 612 participated in the main study. After identifying missing and extreme values, data was collected from 466 pre-service and in-service teachers. During the adaptation process, one Turkish language expert commented on the first draft of the translated survey, three English language experts, and six experts with a Ph.D. in mathematics and science education. According to the feedback of experts, corrections to the translated survey were done by researchers. The characteristics of the participants are shown in Table 1.

Table 1

The characteristics of the participants

	Teachers		Frequency (f)	Percentage(%)	Pre-service Teachers		Frequency (f)	Percentage (%)
Gender	Woman		211	67.63	Woman		115	74.68
	Man		101	32.37	Man		39	25.32
Branch	Science		144	46.15	Science		54	35.06
	Mathematics		106	33.97	Mathematics		66	42.86
	Computer		62	19.87	Computer		34	22.08
Taking courses or attending professional development courses related to STEM	Science Teachers	Yes	66	45.83	Pre-service science teachers	Yes	34	62.96
		No	78	54.17		No	20	37.04
	Mathematics Teachers	Yes	39	36.79	Pre-service Maths teachers	Yes	12	18.19
		No	67	63.21		No	54	81.81
	Computer Teachers	Yes	38	61.29	Pre-service computer teachers	Yes	27	79.41
		No	24	38.71		No	7	20.59
Total	Teachers		312	100	Pre-service Teachers		154	100

Data Collection Tools

TP-STEMK Survey

The TP-STEMK developed by Chai, Jong et al. (2019) was designed to assess pre-service and in-service teachers' self-efficacy in integrated STEM education in technological pedagogical content knowledge (TPACK). The original version consisted of four factors and 17 items. Each sub-dimension of the survey, i.e., technological pedagogical knowledge in science (TPSK), technological pedagogical knowledge in engineering (TPEK), and integrative STEM (iSTEM), consisted of four items, while another sub-dimension, technological pedagogical knowledge in mathematics (TPMK), consisted of five items. The survey consists of seven Likert-type items. These items include disagree-1, disagree-2, partially disagree-3, undecided-4, partially agree-5, agree-6, and agree-7. In addition, there is no item in the survey with a negative meaning on the survey TP-STEMK.

Survey's Adaptation to the Turkish Language

After reviewing the relevant literature on STEM education and TPACK, it was determined that there was a need for a data collection tool to assess teacher self-efficacy from a TPACK perspective in the context of holistic education STEM. The researchers searched the literature for the existing instruments based on this finding. After determining the appropriateness of the TP-STEMK self-efficacy survey for research, the researchers asked permission from the authors of the TP-STEMK survey and received permission from Chai, Jong et al. (2019) via email. The researchers initially translated the TP-STEMK developed in English into Turkish. After the first draft of the translation, the researchers received feedback from one Turkish language expert, three English language experts, and two STEM field experts, who formed a six-member translation team and received support. During the translation assessment, cross-checks were conducted to determine whether differences in the survey were independently translated into Turkish, and a consensus was reached on the common translation. In addition, a Turkish language expert checked the compatibility of the translation with Turkish in terms of spelling and semantic integrity. During the back translation into the original language, the translation was supported by a bilingual expert and compared and reviewed with the original version. Through the expert's feedback, the items' incomprehensible expressions and expression errors were corrected, and the stages of assessing the survey's structural, content, linguistic, and cultural conformity were completed. The survey was translated into a Likert-type format and presented to 54 pre-service teachers in a pilot study to assess its comprehensibility. The results of the pilot study showed that the factors and item distribution were consistent with those of the original survey. Later, the final version of the translated survey was administered to 612 participants. Participants were asked to answer all items in the survey. All surveys answered by participants were included in the analysis. No data loss occurred. The stages of the survey adaptation process to the Turkish language are shown in Figure 1.

Figure 1. The stages of the survey adaptation process to the Turkish language

The following steps were followed in the Turkish adaptation of the TP-STEMK self-efficacy survey:

Data Analysis

The Jamovi program (version 1.6) was used to adapt the survey TP-STEMK (Jamovi Project, 2021). For the survey results administered to the participants, the researchers used the program SPSS 22.0. Regarding the validity of the survey, analyzes were conducted to ensure content validity (content), linguistic validity (linguistic equivalence), and structural validity (concept). For construct validity, confirmatory factor analysis (CFA) was conducted. The choice between exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) methods in adjustment studies is one of the most common problems. While CFA is used to test the correspondence of items to the defined structure, EFA is used to determine which structures the items cover (Brown, 2015; Karaca et al., 2015; Myers, 2000). In this context, the use of CFA seems appropriate due to the fixed factor structures of the original survey (Byrne & van de Vijver, 2014; Fabrigar et al., 1999; Güngör, 2016). In addition, Cronbach's alpha (α)-coefficient, item-total correlation value, and test-retest reliability coefficient (r) were calculated to test the internal consistency of the factors identified in the original survey, and finally, reliability was tested. As a result of the analysis, it was examined whether the items in the survey could measure the sub- factors. Mahalanobis value and deviant outliers were checked in the data set and removed from the data file. Since extreme values lead to errors, it is recommended to remove them from the data file (Tabachnick & Fidell, 2013). In addition, the degree of freedom and the chi-square value

affect the interpretation of the CFA result as the sample grows (Çokluk et al., 2021). This situation may lead to misinterpretation. Therefore, the fit indices x^2/df, CFI, TLI, RMSEA, and SRMR were calculated instead.

Later, the descriptive (arithmetic mean and standard deviation) and inferential statistical data for each variable were calculated. First, we checked whether the distribution was normal by looking at the skewness and kurtosis values (in the range of ±1.96). To reduce the type 1 error and to reveal the significance of the dependent variable (Alpar, 2003), a one-way MANOVA test was used in the analysis. The "Scheffe and Tukey" post hoc test was used as a multiple comparison test. First, the analyzes tested the assumptions of the MANOVA test. For the assumption of the equality of covariance matrices, Box's M test was applied, and in the cases where homogeneity was achieved (Allen et al., 2014; Pallant, 2005), the Wilks-Lambada test was suggested for multivariate test results, and in the cases where homogeneity was not achieved, Pillai's Trace test was recommended (Tabachnick & Fidell, 2013). Assuming equality of Levene error variances, it is assumed that there is no difference between error variances at $p > .01$ or $p > .025$ (Tabachnick & Fidell, 2013). In addition, partial eta squared ($\eta 2$) was used to determine the influence of the independent variable on the dependent variable. Partial Eta squared $\eta 2 = .01$ small effect value, $\eta 2 = .06$ medium effect value, and $\eta 2 = .14$ large effect value (Cohen, 2013).

Ethical considerations

During the study, all guidelines outlined in the Ethics of Scientific Research and Publication in Higher Education Policy were followed, and no actions were taken to the contrary. Faculty members, pre-service, and in-service teachers participated in the study by declaring their voluntary participation via the informed consent form submitted via Google Form. Responsibility for ethical violations in the research rests with the authors.

In this study, all rules stated to be followed within the scope of the "Higher Education Institutions Scientific Research and Publication Ethics Directive" were followed. None of the actions stated under the title "Actions Against Scientific Research and Publication Ethics", which is the second part of the directive, were taken.

Ethical review board name: Scientific research and publication ethics committee of science and engineering Instıtute of Alanya Alaaddin Keykubat University

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RESULTS

Results of the Adaptation

Content Validity

To determine the content validity of the adapted survey in Turkish, the researchers obtained feedback from three language experts on the first draft of the translated survey. The researchers asked these experts to review the translation of each item. The experts reviewed the items and responded to a control form that was given to them. They indicated their feedback on the form as "the item is appropriate or should be corrected as ...". As a result of these feedbacks and reviews, ten items were accepted in their original form. The researchers modified seven items to ensure semantic integrity, linguistic validity, and cultural conformity. For example, the original statement "I can design lessons to integrate interdisciplinary STEM content and technology for student-centered learning appropriately." was translated as "I can design lessons to appropriately integrate holistic STEM content and technology for a student-centered learning approach." translated. However, in light of expert feedback, the same item was changed to "I can design student-centered courses that appropriately integrate interdisciplinary STEM content and technology."

Language Validity

After modifying the first draft of the survey based on the experts' feedback, the researchers used the back-translation method to determine the language equivalence of the survey. In the back-translation process, experts who knew the original language of the survey (English) but did not work on the survey (N=3) translated the items from Turkish to English. As a result of this back-translation, consistency and harmony were found between the original survey and the second draft of the survey after the back-translation. Then, the researchers conducted a pilot study with six pre-service and in-service teachers of science, elementary mathematics, and computer. This pilot study showed that the participants had no difficulty understanding the items.

Construct Validity

Since the original survey has a specific factor structure, the use of the CFA seems appropriate (Fabrigar et al., 1999; Güngör, 2016).

Confirmatory Factor Analysis

The purpose of confirmatory factor analysis (CFA) is to test the fit of the model advocated by exploratory factor analysis (EFA) using some values, to test the same model and verify its validity (Brown, 2015; Myers, 2000; Tabachnick & Fidell, 2013; Yaşaroğlu, 2017). The path diagram showing the factor structure obtained as a result of CFA is shown in Figure 2. The translated survey has four factors, like the original version developed by Chai, Jong et al. (2019).
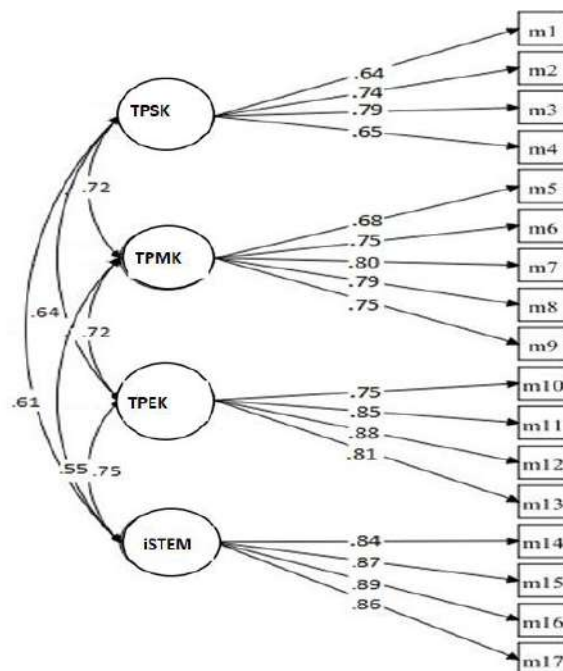
Figure 2. Analysis of item-structure relationships of the STEM-TPACK self-efficacy survey

Looking at Figure 2, the factor loadings of the items on the science dimension of the survey vary from .64 to .79, in the math dimension from .68 to .80, in the engineering dimension from .75 to .88, and in the integrative dimension STEM from .84 to .89. The correlation between the factors is as follows: Science and mathematics dimension .72; Science and engineering .64; .61 between science and integrative STEM; .72 between mathematics and engineering; .55 between mathematics and integrative STEM; .75 between engineering and integrative STEM. According to Kline (2015), the effect value is 'moderate' around .30 and 'high' from .50 and above. In this context, values above .50 mean the effect value between factors is high.

In the confirmatory factor analysis, the model fit indices were examined for the validity of the factor structure of the survey TP-STEMK. The model fit index values (x^2/df, RMSEA, SRMR, CFI, and TLI) obtained by CFA are shown in Table 2.

Table 2

CFA's Compliance values for the TP-STEMK self-efficacy survey

Model Fit Indices	Model Fit Values	Acceptable Fit	Perfect Fit	Conclusion
x^2	316	-	-	-
x^2/df	2.8	0< x^2/df <5	0< x^2/df <3	Perfect Fit
RMSEA	0.0621	0.00≤ RMSEA≤0.10	0.00≤ RMSEA≤0.05	Acceptable Fit
SRMR	0.0346	0.05 ≤ SRMR ≤ 0.10	0 ≤ SRMR <0.05	Perfect Fit
CFI	0.961	0.90 ≤CFI ≤ 1.0	0.95 ≤ CFI ≤ 1.0	Perfect Fit
TLI	0.953	0.90≤TLI≤1.0	0.95≤TLI≤1.0	Perfect Fit

According to the research (Sümer, 2000), the chi-square test (x^2/df) evaluates the model's compatibility with the real data, and the p-value should be significant. Table 2 showed that the values of chi-square and p ($x^2/df=2.8$, p <.001) were significant. When the ratio of chi-square value to degrees of freedom is between 0 and 3 ($0 < x^2/df < 3$; $x^2/df=2.8$), the model has a perfect fit index (Kline, 2015; Meydan & Şeşen, 2015; Tabachnick & Fidell, 2013). According to Table 2, RMSEA=0.0621 shows an acceptable fit, SRMR=0.0346, CFI =0.961, TLI=0.953 shows a perfect fit (Meydan & Şeşen, 2015; Brown, 2015).

Analysis of the validity of the subfactors

An analysis of Pearson product-moment correlation coefficients for the relationships among the knowledge types formed in the subfactors of the TP-STEMK survey is presented in Table 3.

Table 3

Pearson Moments Product Correlation Coefficients for Subfactors of the TP-STEMK Survey

Subfactors		TPSK	TPMK	TPEK	iSTEM
TPSK	r	1			
	p				
TPMK	r	.606**	1		
	p	.000			
TPEK	r	.568**	.650**	1	
	p	.000	.000		
iSTEM	r	.531**	.497**	.695**	1
	p	.000	.000	.000	

**p<0.01

Examination of Table 3 reveals moderate correlation between the survey subfactors (r=.695, r=.650, r=.606 r=.568 and r=.531, r=.497 p < 0.01). In addition, the subfactors that make up the survey are not at extreme values, and the absence of a high correlation level indicates the survey's reliability (Gündüz & Coşkun, 2012).

Results of Reliability Analyses

Internal Consistency

The coefficients of internal consistency (Cronbach's alpha 'α') calculated for a complete survey or its factors are $\alpha > 0.70$, which means that the survey is reliable (Nunnally & Bernstein, 1994; Büyüköztürk, 2020). The internal consistency coefficients (α) of the subfactors in the original TP-STEMK survey and this study are shown in Table 4.

Table 4

Cronbach Alpha (α) internal consistency coefficients for the survey and its factors

	Number of Items	Cronbach alfa (α) Coefficients for Reliability	Cronbach's alpha (α) Coefficients of the Original Survey
STEM -TPACK self-efficacy survey	17	0.937	

	(TP-STEMK)			
Factors	**Technological Pedagogical Knowledge in Science (TPSK)**	4	0.81	0.87
	Technological Pedagogical Knowledge in Mathematics (TPMK)	5	0.80	0.89
	Technological Pedagogical Knowledge in Engineering (TPEK)	4	0.83	0.89
	Integrative STEM Knowledge (iSTEM)	4	0.84	0.91

According to Table 4, Cronbach's alpha coefficient for the TP-STEMK survey was calculated as 0.937. The internal consistency coefficients for the factors TPSK, TPMK, TPEK, and iSTEM were 0.81; 0.80; 0.83, respectively; a value of 0.84 was obtained. Moreover, the Cronbach alpha (α)-coefficients of the factors of the adapted and the original survey are close. Based on these results, it can be said that the reliability value of the survey is high.

Analyses for Item-Total Correlation

The overall correlation coefficients of the items calculated for the Turkish version of the survey TP-STEMK ranged from .66 to .91 (Table 5). Researchers recommend that items with an item correlation coefficient of less than .20 should be removed from the measurement instrument (Büyüköztürk, 2020). Since .20 is not a golden value for survey items, the item was not released. Moreover, according to Büyüköztürk (2020), an item with an item correlation coefficient of 0.3 and above is called a good item. So, the results show that all items in the translated survey are good.

Table 5

Item-total correlation values of the items

Factors	Items	Item-total Correlations
TPSK	M1	.67
	M2	.76
	M3	.78
	M4	.66
TPMK	M5	.69
	M6	.73
	M7	.79
	M8	.80
	M9	.73
TPEK	M10	.69
	M11	.85
	M12	.87
	M13	.79
iSTEM	M14	.87
	M15	.89
	M16	.91

	M17	.87

The results in Table 5 show that the positive correlation between the item-total correlation scores indicates that internal consistency is high and that the items measure similar behaviors (p <.05).

Test-Retest Reliability

To determine the degree of stability of the translated survey, it was administered again to 54 pre-service teachers at four-week intervals. The relationship between the scores obtained on both applications was examined regarding the overall survey, items, and factors, and how stable the final survey was measured. In addition, Büyüköztürk (2020) also indicated that the Pearson moment product correlation coefficient was low between 0.0-0.3, moderate between 0.30 and 0.70, and high between 0.70 and 1.0. The test-retest correlation coefficient regarding the stability level of the survey showed a positive, high, and significant relationship between the two applications $[r_{(54)} = .831, p < .01]$.

Results of the Administration

Results on Preservice teachers

To answer the research question, "Are there statistically significant differences in the subfactors of the TP-STEM knowledge survey according to the program studied by the pre-service teachers?" data were analyzed using a one-way MANOVA. The descriptive results, including the number of data (N), means, and standard deviations (SD) of the variables TPSK, TPMK, TPEK, and iSTEM, depending on the program of study pre-service teachers, are presented in Table 6.

Table 6

Descriptive statistical results of the subfactors of the TP-STEMK survey by pre-service teacher program

Dependent Variable	Studied Program (Independent Variable)	N	x̄	SS
TPSK	Preservice Science Teacher	54	23.24/5.81	2.76
	Pre-service Mathematics Teacher	66	22.25/5.56	2.81
	Preservice Computer Teachers	34	24.17/6.04	2.63
TPMK	Preservice Science Teacher	54	27.77/5.55	3.49
	Pre-service Mathematics Teacher	66	28.22/5.64	4.43
	Preservice Computer Teachers	34	29.52/5.90	4.02
TPEK	Preservice Science Teacher	54	21.59/5.39	3.49
	Pre-service Mathematics Teacher	66	18.07/4.51	3.65
	Preservice Computer Teachers	34	22.50/5.62	3.78
iSTEM	Preservice Science Teacher	54	21.64/5.41	3.16
	Pre-service Mathematics Teacher	66	17.77/4.44	3.55
	Preservice Computer Teachers	34	21.79/5.44	3.41

Table 6 shows that the mean scores of TPSK, TPMK, TPEK, and iSTEM5 are higher among the pre-service computer teachers than pre-service teachers of science and elementary mathematics. In addition, the skewness and kurtosis values of the TPSK, TPMK,

TPEK, and iSTEM subfactors in the pre-service teacher programs show a distribution close to the normal distribution. In this context, the condition of equality of covariance matrices, one of the assumptions of one-factor MANOVA, was tested with Box's test of equality of matrices, and the other assumption, equality of error variances, was tested with Levene's test. In analyzing the Box's M test to assess whether the covariances are equal, Sig. If the p-value in the line p > is .001, the null hypothesis is accepted (Allen et al., 2014; Pallant, 2005). This result means that there is no significant difference between the matrices. The fact that there is no significant difference between the covariance matrices of the dependent variable (p= .029, p >.001) indicates that the assumption of one-way MANOVA is met

The other postulate of one-way MANOVA was tested using Levene's test to determine if there was a significant difference between the error variances. Levene's test was used in the analysis Sig. If the p-value in the p > row is .01 or p > is .025, the null hypothesis is accepted (Tabachnick & Fidell, 2013). This result means that there is no significant difference between the error variances. When testing the error variances of the dependent variables TPSK (p= .213, p >.01), TPMK (p= .056, p >.01), TPEK (p= .943, p >.01), and iSTEM (p= .01). 651, p >.01) showed that the hypothesis "There is no significant difference between the error variants" can be accepted.

The analysis determined that the assumptions of the MANOVA test were met, and a one-way MANOVA analysis was performed. In this context, a multivariate test analysis was performed to determine if there was a difference depending on the program studied. Wilk's Lambada analysis, a type of multivariate analysis (Büyüköztürk, 2020; Green & Salkind, 2005; Tabachnick & Fidell, 2013), was performed.

The Manova results on the TPSK, TPMK, TPEK, and iSTEM responses of pre-service teachers depending on the program they studied showed a significant difference between the dependent variables of the combined TPSK-, TPMK, TPEK, and iSTEM scores depending on the program studied by the pre-service teachers [$F_{(8, 296)}$=9.74, p <.05, Wilk's lambda (Λ)= .627, partial $\eta 2$=.208]. The results of the one-way ANOVA analysis to determine the effects of the independent variables on the dependent variables are shown in Table 7.

Table 7

ANOVA results of TPSK, TPMK, TPEK, and iSTEM scores depend on the pre-service teacher program

Dependent Variable	Type III Sum of Squares	Df	Average Square	F	Sig.	Partial Eta-Squared
TPSK	86.463	2	43.232	5.689	.004	.070
TPMK	65.962	2	32.981	2.025	.136*	.026
TPEK	581.270	2	290.635	22.051	.000	.226
iSTEM	583.477	2	291.739	25.325	.000	.251

*p<.05

Table 7 shows a significant difference in the pre-service teachers' TPSK, TPEK, and iSTEM scores according to the course of study (p <.05). It was found that there was no significant difference in TPMK scores according to a degree program (p >.05). In addition,

the partial eta squared indicates how much of the change in the dependent variable is explained by the independent variable (Pallant, 2005; Rosenthal & Rosnow, 2008). It can be concluded that the largest effect is for the dependent variables TPEK (partial $\eta 2=0.226$) and iSTEM (partial $\eta 2=0.251$). In addition, supplemental analyzes were performed, and a Scheffe posthoc analysis was performed to determine which groups had a significant difference as a function of the program variable examined (Table 8).

Table 8

Post-hoc Scheffe test results of TPSK, TPEK, and iSTEM scores depending on the pre-service teacher program

Subfactors	Program	Program	$\bar{X} - \bar{X}$	Sh_x	Sig.	p<0,05
TPSK	Pre-service Mathematics Teacher (B)	Preservice Computer Teacher (C)	-1.91	.58	.005	B-C
TPEK	Preservice Science Teacher (A)	Pre-service Mathematics Teacher (B)	3.51	.67	.000	A-B
	Pre-service Mathematics Teacher (B)	Preservice Computer Teacher (C)	-4.42	.77	.000	B-C
iSTEM	Elementary Science Teacher Education (A)	Pre-service Mathematics Teacher (B)	3.87	.62	.000	A-B
	Pre-service Mathematics Teacher (B)	Preservice Computer Teacher (C)	-4.02	.72	.000	B-C

Table 8 shows that pre-service computer teachers have higher self-efficacy in the TPSK subdimension than pre-service teachers in the primary mathematics program (p <.05). On the TPEK and iSTEM subfactors, pre-service teachers in the science and computer had higher self-efficacy than pre-service teachers in the Primary Mathematics program (p <.05).

Results on In-Service Teachers

A one-way MANOVA analysis was conducted to answer the research question, "Are there statistically significant differences in the subfactors of the TP-STEM knowledge survey by in-service teachers' majors?" The descriptive results, including the number of data (N), mean, and standard deviation (SD) of the TPSK, TPMK, TPEK, and iSTEM variables by teachers' fields of study, are presented in Table 9.

Table 9

Descriptive statistical results for survey subfactors by teacher branch

Dependent Variable	Branch (Independent variable)	N	$\bar{X}$	SS
TPSK	Science Teacher	144	22.34/5.85	3.07
	Mathematics Teacher	106	20.53/5.13	2.90
	Computer Teachers	62	23.64/5.91	2.66
TPMK	Science Teacher	144	25.02/5.00	5.09

	Mathematics Teacher	106	25.18/5.03	3.98
	Computer Teachers	62	27.61/5.52	4.25
	Science Teacher	144	19.71/4.92	4.74
TPEK	Mathematics Teacher	106	17.30/4.32	4.68
	Computer Teachers	62	22.1675.54	3.86
	Science Teacher	144	19.99/4.99	4.83
iSTEM	Mathematics Teacher	106	16.61/4.15	4.99
	Computer Teachers	62	20.95/5.23	3.98

Table 9 shows that the TPSK, TPMK, TPEK, and iSTEM scores of computer teachers are descriptively higher than those of science and elementary math teachers. In addition, the skewness and kurtosis values of the TPSK, TPMK, TPEK, and iSTEM scores by teacher branch also show a distribution that is close to the normal distribution. In this context, the condition of equality of the covariance matrices, one of the assumptions of the one-factor MANOVA, was tested with the Box test for equality of the matrices, and the other assumption, equality of the error variances, was tested with Levene's test.

The null hypothesis is accepted in the analysis of Box's M-test to determine if the covariances are equal if the p-value in the line $p >$ is .001 (Allen et al., 2014; Pallant, 2005). This result means that there is no significant difference between the matrices. Accordingly, it was found that there is no significant difference between the covariance matrices of the dependent variable ($p = .011$, $p > .001$), and the assumption of one-way MANOVA is satisfied.

The other postulate of one-way MANOVA was tested using Levene's test to determine if there is a significant difference between the error variances. If the p-value in Levene's test analysis is $p > .01$ or $p > .025$, the null hypothesis is accepted (Tabachnick & Fidell, 2013). This result means that there is no significant difference between the error variances. Examination of the values for TPSK ($p = .566$, $p > .01$), TPMK ($p = .036$, $p > .01$), TPEK ($p = .057$, $p > .01$), and iSTEM ($p = .200$, $p > .01$) shows that the hypothesis "There is no significant difference between error variances" can be accepted. Based on the analysis, it was determined that the assumptions of MANOVA were met, and a one-way MANOVA analysis was performed. In this context, a multivariate test analysis was performed to determine if there was a difference depending on the program studied. Wilk's Lambada analysis of multivariate analysis of research (Büyüköztürk, 2020; Green & Salkind, 2005; Tabachnick & Fidell, 2013) was conducted.

When the Manova results of teachers' TPSK, TPMK, TPEK, and iSTEM scores were examined together by teacher branch, there was a significant difference in the subfactors of TPSK, TPMK, TPEK, and iSTEM together by teacher branch [$F_{(8,612)} = 13.609$, $p < .05$, Wilk's lambda (Λ) = .721, partial $\eta^2 = .151$]. Indeed, it was found that teachers' TPSK, TPMK, TPEK, and iSTEM ratings by their branches were not similar when considered together. The results of the one-way analysis ANOVA, which was conducted to determine the effect of the independent variables on the dependent variables, are presented in Table 10.

Table 10

ANOVA test results of teachers' TPSK, TPMK, TPEK, and iSTEM scores by their branches.

Dependent Variable	Type III Sum of Squares	Df	Average Square	F	Sig.	Partial Eta-Squared
TPSK	411.080	2	205.540	23.815	.000	.134
TPMK	317.431	2	158.715	7.578	.001	.047
TPEK	953.559	2	476.780	22.891	.000	.129
iSTEM	981.623	2	490.811	21.888	.000	.124

*p<.05

Table 10 shows a significant difference in teachers' TPSK, TPMK, TPEK, and iSTEM scores depending on their branch (p <.05). Teachers' branches significantly impact on all subfactors. In addition, the partial eta squared indicates how much of the change in the dependent variable is explained by the independent variable (Pallant, 2005; Rosenthal & Rosnow, 2008). It can be concluded that the smallest effect is due to the dependent variable TPMK (partial $\eta2=0.047$). Furthermore, supplemental analyses were conducted, and a Scheffe post hoc analysis was performed to determine which groups had a significant difference concerning the program variable under study (Table 11).

Table 11

Post-hoc Scheffe test results of teachers' TPSK, TPMK, TPEK, and iSTEM scores by Branch.

Subfactors	Branch	Branch	$\bar{X} - \bar{X}$	Sh_x	Sig.	p<0,05
TPSK	Science Teacher (A)	Mathematics Teacher (B)	1.80	.38	.000	A-B
	Science Teacher (A)	Computer Teachers (C)	-1.30	.45	.015	A-C
	Mathematics Teacher (B)	Computer Teachers (C)	-3.10	.47	.000	B-C
TPMK	Science Teacher (A)	Computer Teachers (C)	-2.59	.69	.001	A-C
	Mathematics Teacher (B)	Computer Teachers (C)	-2.42	.73	.005	B-C
TPEK	Science Teacher (A)	Mathematics Teacher (B)	2.41	.58	.000	A-B
	Science Teacher (A)	Computer Teachers (C)	-2.44	.69	.002	A-C
	Mathematics Teacher (B)	Computer Teachers (C)	-4.85	.73	.000	B-C
iSTEM	Science Teacher (A)	Mathematics Teacher (B)	3.38	.61	.000	A-B
	Mathematics Teacher (B)	Computer Teachers (C)	-4.34	.76	.000	B-C

p<.05

Table 11 shows a significant difference between computer teachers and elementary school mathematics and science teachers on the TPSK, TPMK, and TPEK subfactors in favor of computer teachers (p <.05). Computer teachers were found to have higher self-efficacy in TPSK, TPMK, and TPEK. In addition, science teachers were found to have higher self-

efficacy in the TPSK, TPEK, and iSTEM subfactors than elementary mathematics teachers (p <.05). In the iSTEM subdimension, computer teachers were found to have significantly higher self-efficacy than elementary mathematics teachers.

DISCUSSION AND CONCLUSION

Discussion and conclusion on Survey Adaptation

In this research, an attempt was made to translate the TP-STEMK survey into Turkish by conducting validity and reliability studies. For the construct validity of the questionnaire, the use of DFA was preferred due to the factor structure of the original scale (Fabrigar et al, 1999; Güngör, 2016). The purpose of the DFA is to test the significance and accuracy of the factor structure identified by the AFA and to determine whether the results confirm the model (Brown, 2015; Hair et al, 2010). As a result of the CFA analyses undertaken to ensure the survey's construct validity, it was found that the fit indices (x^2=316, x^2/df=2.8, CFI=0.961, TLI=0.953, SRMR=0.0346) were fully compatible (Kline, 2015; Meydan & Şeşen, 2015; Tabachnick & Fidell, 2013) and (RMSEA=0.0621) acceptable (Brown, 2015; Meydan & Şeşen, 2015). Values close to the fit indices of the original survey TP-STEMK were obtained [x^2 = 211.45, x^2/df = 1.99, CFI = 0.97, TLI = 0.96, RMSEA = 0.067, SRMR = 0.047, (Chai, Jong et al., 2019)]. These values indicate that the survey structure was suitable for the Turkish participants. At the same time, a positive and significant relationship was found between the subfactors of the TP-STEMK survey (see Table 3).

To determine the reliability of the survey, analyses of internal consistency (Cronbach's alpha), item-total correlation, and test-retest reliability were performed. Researchers have pointed out that if the reliability of a survey is low, its scientific value is also low (Ercan & Kan, 2004). The Cronbach's alpha coefficients (α>0.70) calculated for internal reliability show that the reliability value of the survey TP-STEMK is high [see Table 4 (Büyüköztürk, 2020; Nunnally & Bernstein, 1994)]. It was found that the item-total correlation coefficients of the survey were positive and statistically significant, and the internal consistency between item values was high. These results indicate that the items measure similar features. The test-retest method used to determine the stability of the survey showed a high, positive, and significant relationship between the scores [see Table 7, (Büyüköztürk, 2020)]. In light of these results, the researchers conclude that the TP-STEMK self-efficacy survey is a measurement tool used by scholars with high validity and reliability.

Based on the analysis results, it can be concluded that the TP-STEMK survey is useful because it integrates the seven-factors structure of TPACK advocated by Mishra and Koehler (2006) into STEM education. In this study, the TPCK framework was not limited to one subject. It was examined in an interdisciplinary context. As Chai, Rahmawati et al. (2020) stated, this context shows that the survey predicts teacher competencies in integrative STEM instruction. All the research results show that the survey used in this research will contribute to the literature.

Discussion and conclusion on the Application of the Survey

While the TPSK, TPEK, and iSTEM self-efficacy factors differed according to pre-service teachers' program variables, no differentiation was found for the TPMK dimension. It was found that pre-service elementary mathematics teachers' TPSK, TPMK, TPEK, and iSTEM scores were lower than those of other programs. It can be speculated that pre-service elementary mathematics teachers did not receive STEM or interdisciplinary training during their studies at the college may be a reason for this result. Another finding supporting this result is that less than one-fifth of the pre-service elementary mathematics teachers involved in this study reported that they had taken courses or training related to STEM or interdisciplinary teaching (see Table 1). The TPEK and iSTEM factors found that the knowledge levels of pre-service science and pre-service computer teachers were similar. This result may be due to courses taken or STEM activities in college classes (see Table 1). Some studies in the literature indicate that pre-service teachers' knowledge and awareness of science and computers in STEM are at a higher level (Yenilmez & Balbağ, 2016; Karışan & Bakırcı, 2018). This result is consistent with the findings of the related research.

When looking at the branches of in-service teachers, there were differences in self-efficacy of TPSK, TPMK, TPEK, and iSTEM. The research results showed that computer teachers performed better than other teachers in all knowledge factors, while elementary mathematics teachers had the lowest self-efficacy level in all knowledge factors. It was also found that science teachers' self-efficacy was better than mathematics teachers in all sub-factors. It is suggested that this result may have implications for theoretical and practical training for teaching STEM. Because if we look at the characteristics of the participants, we can find that the percentage of STEM training for computer and science teachers is higher than that of elementary mathematics teachers, who conducted more STEM activities in their courses.

For this reason, they have a better STEM knowledge level than elementary school mathematics teachers (see Table 1.) In the study conducted by Chai, Jong et al. (2019), it was found that the knowledge self-efficacy of science teachers was higher than that of mathematics teachers in TPEK, TPSK, and iSTEM factors. The results of this study are similar to those of Chai, Jong et al. (2019). In addition, Chai, Jong et al. (2019) reported that science teachers in China mainly conduct STEM activities. They also pointed out that science teachers' implementation was due to the professional development courses they attended.

However, Chai, Jong et al. (2019) concluded that computer teachers' knowledge self-efficacy was higher than that of mathematics teachers on all factors, including the TPMK subdimension. They explained that this result was since the teachers had received computer training and had degrees in technology. In this regard, the study supports our research findings. Chai, Jong et al. (2019) used the original survey to show that mathematics teachers have a lower level of TP-STEM knowledge than science and computer teachers, similar to the result of this research. Özbilen (2018) found that science teachers had higher STEM

educational awareness than mathematics and technology design teachers in elementary school because they do STEM activities in the classroom. Hiğde et al. (2020) found that computer teachers had higher STEM educational awareness than elementary science, mathematics, and classroom teachers. He explained that such a result could be since computer teachers may have learned more about STEM during professional development courses and college. Wang et al. (2011) concluded that the branch variable impacts teachers' perceptions and orientations toward STEM education. In this regard, the research findings support the findings of previous studies. On the other hand, contrary to the results of this study, some studies in the literature report that the branch variable is ineffective (Demirkol et al., 2022).

When all pre-service and pre-service teachers were compared on the TPSK, TPMK, TPEK, and İSTEM subfactors by branch and program variable, it was found that they had the lowest mean scores on the TPEK and iSTEM factors. Similar to the result in this research, Chai, Jong et al.'s (2019) study also revealed that the engineering knowledge of integrated STEM education teachers was not at the desired level. From this perspective, this result is consistent with the findings of Chai, Jong et al. (2019). Chai, Jong et al. (2019) proposed collaboration between professors of engineering faculties and teacher educators to improve the engineering knowledge of teachers in undergraduate education. In short, it was emphasized that interdisciplinary collaboration is important. The correlation between TPEK and iSTEM in the subfactors is the highest compared to the others. It can be said that training that increases TPEK also will increase iSTEM knowledge.

RECOMMENDATIONS

This study also has some limitations. The first limitation is that the TP-STEMK survey used in the study is of Likert type. Based on the results of this research, it can be stated that the data collection instrument, including a test consisting of open or multiple-choice questions, can be developed to assess teachers' knowledge in training TP-STEM. The second limitation is that this study was conducted with a group of participants consisting of mathematics, science, computer science, and instructional technology teachers and pre-service teachers. Future studies may be conducted with pre-service teachers and teachers from other disciplines. After having these findings, the researchers believe that providing teachers with professional development courses focusing on STEM teaching by incorporating engineering and technology will improve their self-efficacy related to TP-STEMK. The study found that pre-service teachers' engineering knowledge was lower than their knowledge in the other subfactors. It is believed that courses developed by scientists studying engineering education will help them improve their knowledge level of engineering. Considering the results of this study, the inclusion of STEM in the curriculum will positively impact the TP-STEMK of pre-service teachers. Finally, this study is a cross-sectional survey with quantitative data collection. Qualitative or mixed methods research

can be conducted by diversifying the data collection instruments that can be used to explore further the knowledge of technology education STEM of pre-service and in-service teachers.

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Author(s)' statements on ethics and conflict of interest

Ethics statement: We hereby declare that research/publication ethics and citing principles have been considered in all the stages of the study. We take full responsibility for the content of the paper in case of dispute.

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APPENDIX

Survey of Technological Pedagogical STEM Knowledge

Teknolojik Pedagojik STEM Bilgi (TP-STEMB) Ölçeği

Bu ölçek sizlerin Teknolojik Pedagojik STEM Bilgi öz-yeterliliğinizi belirlemeyi amaçlanmaktadır. Ölçekteki her madde kesinlikle katılmıyorum, katılmıyorum, kısmen katılmıyorum, kararsızım, kısmen katılıyorum, katılıyorum ve kesinlikle katılıyorum şeklinde derecelendirilmiştir Lütfen ölçekteki her maddede düşüncelerinizi en iyi ifade eden tek seçeneği işaretleyiniz.

Bilgi Boyutları	No	Derecelendirme / Ölçek maddeleri	Kesinlikle Katılmıyorum	Katılmıyorum	Kısmen Katılmıyorum	Kararsızım	Kısmen Katılıyorum	Katılıyorum	Kesinlikle Katılıyorum
Teknolojik pedagojik Bilim Bilgisi	1	Öğrencilerin bilimsel kavramlarla ilgili bağlantılı anlayışlarını çeşitli teknoloji yöntemleriyle ifade etmelerini sağlayabilirim (ör. Google sitesi, kavram haritaları).							
	2	Öğrencilerimin bilim araştırmaları için çeşitli web tabanlı kaynaklardan bilgileri eleştirel bir şekilde sentezlemelerine yardımcı olma konusunda yetkinim.							
	3	Öğrencileri özgün araştırmalara teşvik etmek için bilim konularına dayalı uygun teknolojileri nasıl seçeceğimi biliyorum.							
	4	Öğrencilerin bilimsel sorgulama için sınıf dışında da devam eden işbirliğini kolaylaştırmada teknolojiyi kullanabilirim.							
Teknolojik pedagojik matematik bilgisi	5	Öğrencilerin gerçek yaşam problemlerini çözmek için matematiksel ifadeleri teknolojiyle formüle etmelerini destekleyebilirim.							
	6	Öğrencilere karşılaştıkları gerçek yaşam problemlerini çözmek için ihtiyaç duydukları geçerli ölçüm verilerini uygun teknolojilerle (ör. veri kaydediciler, uzaklıkölçer) toplamaları konusunda rehberlik edebilirim.							
	7	Gerçek yaşam problemleri hakkında olası matematiksel modelleri							

		oluşturmada, uygun teknolojileri kullanarak, öğrencilerin etkin olmalarını sağlayabilirim (ör. simülasyon yazılımı).							
	8	Öğrenciler grup üyeleriyle birlikte bilgisayarda olası ürünler oluştururken, matematiksel bilgi içeren tartışmalarını yönlendirmede yetkinim.							
	9	Öğrencilere bir olgu için kararlarını destekleyen bir dizi mantıklı matematiksel çıktılar (ör. çizelgeler kullanarak) oluşturmalarında rehberlik edebilirim.							
Teknolojik Pedagojik Mühendislik Bilgisi	10	Çeşitli dijital teknolojileri kullanarak, öğrencilerin mühendislik tasarım süreciyle ilgili bilgilerle etkileşimini sağlarım (örneğin, Powerpoint sunumu, online videolar).							
	11	Mühendislerin fikirlerini geliştirmek için kullandıkları çeşitli yazılım araçlarını; öğrencilerin, öğrenmelerini kolaylaştırmada kullanmaya yetkinim (ör. Bilgisayar destekli tasarım araçları).							
	12	Karmaşık mühendislik problemlerini çözmede öğrencileri desteklemek için teknolojiler kullanabilirim.							
	13	Mühendislik projelerinde öğrencilerin arasındaki online iş birliğini desteklemede daha önceden yapılan çalışmaların veri, analiz ve sonuçlarını kullanabilirim.							
Bütünleştirici STEM	14	Disiplinler arası STEM içerikleri ile teknolojiyi uygun şekilde entegre eden öğrenci merkezli dersler tasarlayabilirim.							
	15	Öğrencileri disiplinler arası öğrenmeye teşvik eden iyi STEM problemleri tasarlayabilirim.							
	16	STEM projelerinde yer alan farklı konular için farklı öğrenme, öğretme etkinlikleri planlayabilirim.							
	17	Öğrencilerin STEM uygulamalarında çeşitli bilgi-iletişim teknoloji araçlarını kullanarak bilgiyi yapılandırmalarını kolaylaştırabilirim.							

Research on professional Turkish teacher law based on teachers' rights and freedoms

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Abstract:

The "Teaching Profession Law" came into force in February 2022 to regulate the professional rights of teachers. The scope and purpose of this law are to regulate the professional development and career steps of teachers. This research aimed to determine the opinions of teachers about the new law of the profession. It is a descriptive study in survey design. Teachers (379 female, 285 male) from all school types, teaching levels, geographical regions, and seniority participated voluntarily in this study. Teachers think that the new professional law will not improve their rights and increase the prestige of the profession. Teachers think that the new law of professional development is not adequately discussed or discussed based on scientific data. According to teachers, the new professional law does not encourage professional development. Teachers stated that though they generally support the need for such a profession law, the new law should be discussed more opportunities that are promising should be offered to teachers.

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INTRODUCTION

The primary purpose of education systems is to train the staff of their countries. Every education system aims to achieve economic development and prosperity, to be a partner in competition in the global economy, and most importantly, it wants to develop its cultural assets and transfer them to future generations (Hirsch, 2008). To achieve this goal, they need to train staff with up-to-date knowledge and skills, adopt the cultural values of their society, and be respectful of different cultures. The main focus of educational institutions, which are the cornerstone of the community, is teachers. In general terms, from the point of view of current education, the teacher is a guide. The teacher is an advisor, rater, provides discipline, and is responsible for constructing social morality. In this respect, it is the teacher who builds up the next generation. As Atatürk (the founding father of the Republic of Turkey) stated, *"Teachers, the new generation will be your masterwork."* The only way to achieve this is through a quality education process. As Andreas, the director of the Program for International Student Assessment (PISA), organized by the Organization for Economic Co-operation and Development (OECD), stated, *"an education system can only be as good as its teachers"* (Altuntas, 2017).

It has been noted in various studies that the teacher factor is the most influential in educational outcomes (Archibald, Coggshall, Croft, & Goe, 2011; Darling-Hammond, 2000). While the teaching profession is so important in building the future and society, it has faced various difficulties and contradictory policies in Turkey. For various reasons, due diligence in the teaching profession is postponed. It is frequently argued that it is still not at the expected and deserved level in the eyes of society and instructors today (Neyişçi, Turabik, Gün & Kısa, 2020). With the developments in science and technology and the changes in the social field, new roles have been defined for education in the international arena at the social, cultural, and economic levels. These new roles have strengthened the importance of education and made it the focus of different societal problems. In this respect, the search for better ways to quality education has gained more emphasis.

Although the understanding of quality in education is multidimensional, it is a subject that needs to be discussed over the different elements that make the education system holistic. Some research around the world measures the outputs of the education system, and according to the data obtained, different expectations and pressures occur in public (Gürbüz & Altun, 2019). As a reference, PISA evaluates and ranks education systems holistically. Finally, more than 600,000 students participated in PISA 2018, representing 32 million students aged 15 in 79 countries and economies (OECD, 2019). Turkey has been participating in the PISA survey since 2003. Although Turkey is the country that improved the average score in mathematics in PISA 2018 compared to PISA 2015 (MoNE, 2019), it is seen that no success has been achieved in the ranking. In summary, although there has been an improvement in the Turkish education system over the years, it is still not at the OECD average.

In the "Teaching and Learning International Survey" (TALIS) conducted by the OECD in 2018 with teachers in 48 countries, it was found that 50% of the participating teachers in all countries had a bachelor's degree, the highest level of education. In Turkey, on the other hand, it was found out that 75% of this rate is undergraduate degree as the highest education level. While the rate of teachers with postgraduate education among the teachers included in the research in OECD countries is 45.5%, it is 7.1% in Turkey. Similarly, in the annual report of the (Ministry of National Education [MoNE], 2019), the rate of personnel with postgraduate education was found as 9.07%. It has been stated that teacher education at the undergraduate level may be insufficient to provide quality education to students whose interests, needs, and expectations are constantly changing, as well as the increasing public expectation. Teaching activities have turned into a complex situation (İlğan, 2021). The teacher's education level is the third explanatory factor in predicting the mathematics achievement of Turkish students participating in the Trends in International Mathematics and Science Study (TIMSS), TIMSS 2015 (Özkan, 2019). In Singapore, which has achieved very successful results in PISA and TIMSS research, it has been revealed that the students of teachers with postgraduate education are more successful than those of teachers with undergraduate education (Özkan, 2019). It has been stated that teachers with postgraduate education, who offer strong expertise and quality content, start the profession more prepared than those with undergraduate level (İlğan, 2021).

These concerns are now even more significant and are a topic of current debate. The reason for this is undoubtedly the "Teaching Professional Law," which came into force after being published in the Resmi Gazete dated February 14, 2022, and was enacted to regulate the professional rights of teachers. The scope and purpose of this law are declared to regulate teachers' professional development and career steps (Resmi Gazete, 2022). Although all circles accept the necessity of change, it is not easy for individuals in the organization to adapt to change management practices at the desired level.

The most common attitude within the organization against change practices has been observed as resistance (Pideritt, 2000). Although most organizational people complain about their situation, they are worried or even afraid of the change phenomenon (Hussey, 1997). The most common attitude within the organization against change practices has been observed as resistance (Pideritt, 2000). Although most organizational people complain about their situation, they are afraid or even afraid of the phenomenon of change (Hussey, 1997). Approaches to resistance have stated that resistance should not be a situation that should be prevented; on the contrary, it should be accepted as a helpful mechanism within the institution (Furst & Cable, 2008). Suppose the underlying causes of the resistance tendency are questioned. In that case, it may be possible to elucidate the factors that will lead to the failure of the change management process and re-determine and develop the goals as mutually acceptable (Lüscher and Lewis; 2008; Ford & Ford, 2009). Based on these concerns, this study will evaluate teachers' views on the newly enacted "teaching profession law in Turkey." It is seen that these new regulations on the teaching profession, which is an

essential issue in Turkey, are to encourage career planning and professional development for the teaching profession. The views of those who still practice the teaching profession and their views on change are determined. These views and relationships are explained with various descriptive statistics.

Turkish Education Association Coordinator Sunar stated that the law is far from integrity, the law is regulated without considering all the profession's processes, and there is no article regarding the problems experienced by teachers (ERG, 2022). Teacher unions, on the other hand, state that the bill's content in its current form is insufficient. Similarly, there are criticisms that the new professional law, enacted to solve teachers' problems, was prepared without asking teachers' opinions. In this respect, getting teachers' opinions affected by the new law in this study is valuable. The enactment of the teaching profession law is undoubtedly an excellent development besides its absence. However, it is thought that the data obtained from this study will be important in developing it in the current process and revealing teachers' views in the business's kitchen during this development phase.

Teaching Profession in Turkey

The formal teacher training process in Turkey started in 1848 with the first teacher training school. With the changes made in the laws in the following years, teacher training was organized in 1924 and 1935, respectively. First, educational institutions were established in 1974 with the National Education Basic Law No. 1739 to train teachers at all levels at the higher education level. In 1982, these institutions were included in universities. In 1989, the duration of education was determined as four years. Education faculties took over the process in 1992. There were times when teacher training was insufficient. As a result, solutions such as reserve officer teaching, substitute teacher teaching, teacher pedagogy certificate courses, teacher training by letter, teacher training with the accelerated program, and appointing teachers from faculty graduates outside the education faculty have been produced in order to reach the required number of teachers (Akyüz, 2001). In the process, it was decided to restructure the universities that carry out the task of teacher training since the problems in teacher training, both in terms of quality and quantity, did not decrease. With the cooperation of the Council of Higher Education (CoHE), the World Bank, and the Ministry of National Education, the National Education Development Project and the Teacher Training Project initiated a change in the teacher training system. Education faculties have been restructured since 1998. This regulation is still in effect.

Preparation for the teaching profession can be based on general culture, teaching content knowledge, and teaching professional knowledge (Demirel, 1999). In order to gain these qualifications during the preparation process, it was deemed necessary for prospective teachers to have higher education in all branches and education levels.

In teacher training programs, it is aimed that the teacher candidate has expertise in a particular field. The classroom teacher and math teachers are examples of this. Therefore,

some of the courses in the program have been determined to provide this. For the professional success of the teacher, first of all, he must know his field of expertise well. There is a dominant belief that to teach, you must first know. Formal education institutions try to gain knowledge and skills of culture, primarily scientific products.

Although the teacher's knowledge of a field or subject is a prerequisite for teaching, it is not sufficient for successful teaching. The teacher should also know how to teach what he knows. In addition to having expertise in a field, a teacher also needs knowledge and skills related to the teaching profession. No matter how well the teacher knows the subject area, if he cannot transfer his knowledge to his students, he cannot succeed in his profession. Therefore, the teacher must have teaching skills. In this context, pedagogical content knowledge, expressed by Shulman (1986), which can be described as a synthesis of content knowledge and teaching profession knowledge, involves an aspect of teachers' professional expertise (Park & Oliver, 2008). The pedagogical content knowledge that puts the teacher at its center is the knowledge of how the related branch can be transferred to the students more easily (Uşak, 2005). Regarding this, the three titles mentioned above cannot be ignored in the development process of a teacher. In teacher performance and learning outcomes, the essential components of pre-service education, content knowledge, Teaching Profession Knowledge, and general cultural knowledge are important; it is possible to state that these alone are far from adequate indicators for performance (İlğan, 2014). Barber and Mourshed (2007) stated that the teacher's professional development is the main difference between the academic performance of students from high and low-performing countries in mathematics and science literacy. Again, professional development plays an increasingly crucial role in reform efforts and the renewal of national education systems in the global context of pressures to increase educational outcomes (Hardy, 2012). In addition, there is vast information production in today's technology world. In a world where there is such a rapid production of knowledge, it is essential that the professional development activities of teachers, who are professional employees, continue throughout their lives. Thus, it is essential to determine policies that encourage teachers in professional development.

Professional Development

All these studies to support the professional skills of teachers in and outside the school, and seek for better teaching and learning methods can be called professional development (PD). PD includes formal and informal learning, trial, development, and progress activities that the teacher has done to make the in-service teaching process more qualified. It is all the activities that teachers participate in during their career (Hardy, 2012) activities designed to further their professional work (Day & Sachs, 2004). PD activities are the shortest way to qualified education worldwide (Hardy, 2012). Jensen and Farmer (2013) emphasized that the success of the Shanghai region of China, which has consistently achieved good results in Mathematics and Science in the PISA research, is directly related to PD, emphasizing professional collaboration as a secret.

In the TALIS 2018 survey, the level of professional development was found to be needed for each subject area (content knowledge, pedagogical competencies in the taught area, curriculum information, analysis of student assessment, and teacher-parent cooperation). In a study, compared to other OECD member countries' teachers, less numbers of Turkish teachers in all subject areas asked for their need in Professional development. While approximately 4% of teachers in Turkey reported their need of professional development in terms of pedagogical competencies in the field taught, this rate is approximately 10% in OECD member countries (Ceylan et al., 2020). Teachers in Turkey are more distant towards professional development than the teachers of OECD countries. Regarding the professional development activities, they participated in the last year, 8.44% of the teachers stated that the main reason why they participated in professional development activities in Turkey was the increase in their salaries due to their attendance in such activities.

Similarly, those who stated that various supports were provided if they participated in a professional development activity comprised of 27.9% of the participants (OECD, 2019). These rates are better than developed and OECD member countries (Ceylan et al., 2020). In addition, 28.1% of teachers in Turkey think that professional development activities do not have a positive effect on their teaching practice (Ceylan et al., 2020). This rate on the other hand, was found to be lower in OECD member countries (OECD, 2019).

In the context of PD, there is no consensus on determining the core teaching practices for specialized teachers. This situation is seen as a challenge for PD activities (DeMonte, 2013). Many PDs are conducted without teacher practice and linkage to the school improvement plan (Cohen & Hill, 2000). In OECD member countries, it has been determined that PD activities that teachers have participated in in the last year are not sufficiently compatible with the needs of teachers (OECD, 2019). According to the opinions of teachers in the OECD (2019) report, the three most important factors limiting participation in PD activities in Turkey are lack of adequate incentives (68.7%), conflict with working hours (55.9%), and insufficient support by the employer (55.2%) (OECD, 2019). In PD activities, providing the needed time and encouraging teachers (Jensen & Farmer, 2013); the necessary support and encouragement to enable them to apply the ideas and strategies they have learned within their classrooms are important issues (Desimone & Garet, 2015). The support of school leadership is needed in planning the teacher's weekly lesson schedule to facilitate participation in PD activities (OECD, 2019). The main factors that determine the status of the teaching profession are its social and economic situation, it is stated in various studies that insufficient wages negatively affect the reputation of the teaching profession and that less talented personnel come to the teaching profession. (Çelikten, 2005; İlğan, 2014; OECD, 2019).

Purpose of the research

When the situations in the literature and the teacher training system in Turkey are examined, it is vital to understand the new teaching profession law of teachers to find solutions to the problems mentioned in professional development and teacher training. This research aims to determine teachers' opinions about the new teaching profession law. The main problem statement of this study is; "What are the teachers' views on the new teaching profession law?" In line with this purpose, the following questions were investigated:

Sub-problems

1: What are the teachers' views on the four sub-dimensions of the new teaching profession law?

2: What are the teachers' opinions about the new teaching profession law?

3: Is there a significant difference between teachers' views about the new teaching profession law and the variables of gender, seniority, education level, and geographical region?

METHOD

This research is a descriptive study in the survey model to determine teachers' views about the new teaching profession law (personal rights, scientificity of the law, professional development, and teachers' ideas) after the teaching profession law came into force. A descriptive study aims to describe a past or present situation as it is (Karasar, 2012). The data needed in the survey model is gathered from the majority of the participants through data collection tools such as interview forms or questionnaires (Creswell, 2002). This method was chosen because the opinions of the teachers about the new law were tried to be reflected by using a questionnaire.

Participants

Teachers (pre-school, primary, secondary, and high school teachers) from all types of schools and all types of teaching voluntarily participated in this study. The Survey remained in the announcement for two months from the date of the new occupational law. The participants of the research consist of 664 teachers who are still in their profession. Accordingly, stratified purposive sampling, one of the purposive sampling methods, was used in the collection of the data. Of the participants, 379 (42.9%) were female, and 285 (57.1%) were male. Participation was made from all geographical regions of Turkey. As stated in the report (Education Information Network in the European Community [EURYDICE], 2009) regarding the Turkish education system, geographical regions in Turkey are divided into seven regions according to their development, geographical characteristics, and population-cultural structure. Marmara, Aegean, Mediterranean, Middle Anatolia, Black Sea, East Anatolia, and Southeast Anatolia regions were taken as

geographical regions. All occupational groups in schools in Turkey participated in the research. Teachers have different professional experiences. According to this, 45 (7%) people with 0-5 years of seniority, 133 (20%) people with 6-10 years, 114 (17%) people with 11-15 years, 123 (18%) people with 16-20 years, 128 (19%) people who are 21-25 years old, 121 (18%) people who are 26+ years. Among the participants, the rate of those who did not know about the new profession law was 12.8%, while the rest of the teachers stated that they knew the new profession law, 87.2%.

Data Collection Tools

The researchers designed a special Likert scale type questionnaire to determine the views and expectations of teachers regarding the newly enacted law regulating teachers' professional rights in Turkey.For this data collection tool, arrangements were made on the data collection tools with the help of a field expert, a language expert, and an assessment and evaluation expert in terms of content. In addition, in order to ensure the content validity of the data collection tool, a preliminary application was made by applying it to 90 teachers from outside the sample. Necessary corrections were made in the data collection tool to some statements which teachers had difficulty to understand. As a result of the reliability analysis, the Cronbach Alpha reliability coefficient was found to be .89.

The questionnaire comprises 15 items ranging from 1. Strongly disagree to 5. Strongly agree, indicating the degree of teachers' agreement. In order to know the views of teachers on the new professional law specifically, the items were grouped into four categories: (1) teachers' rights (3 items); (2) consideration of professional, scientific studies on the law (4 items); (3) teachers' ideas about the law (4 items); (4) teachers' professional development (3 items). The last item of the questionnaire was the teachers' opinions individually about the subject, and it was designed as open-ended.

Procedure and Data Analysis

Survey invitations were sent to teachers from all levels, branches, and regions. The survey application, implemented through Google Forms, and teachers' opinions facilitated both the filling out of the Survey and the analysis process. The Survey was sent to teachers from various social media groups and communication networks that teachers use effectively, concerning teachers in schools where academic and scientific activities were carried out in the past. In addition, the Questionnaire was announced to the schools through the District Directorates of National Education in each Province. In the invitation content, the research objectives were explained, and the anonymity of the participants was guaranteed. After the teachers filled out the Survey, they clicked on it to *send a survey*, and the Survey was telematically filed into a database. In this process, although the participants had the freedom to change their answers to the Survey, only 0.5% changed their answers.

Descriptive analysis techniques such as frequency and percentage calculation were used to analyze the survey and interview questions (Creswell, 2014). SPSS 25 statistical

program was used for data analysis. Frequency and percentage calculations were made while evaluating the teachers' characteristics. Arithmetic averages were calculated regarding the teachers' opinions about the items in the data collection tool. Among the two main methods of assessing normality, the Kolmogorov–Smirnov test was used for n ≥50, which is extremely sensitive to large sample sizes, since p < .05, the data appear not to be normally distributed (Ghasemi & Zahediasl, 2012). To compare teachers' opinions about the new professional law in terms of their characteristics, the U-test identified whether there is a significant difference between the two averages due to the non-normal distribution of the data. The Kruskal Wallis H test analysis tests whether there is a significant difference between more than two averages. Significance was sought at the p < 0.05 level in statistical analysis. In addition, the Kruskal Wallis analysis result was checked with Bonferroni correction. Bonferroni correction is a correction at the significance limit to avoid Type I error in post-hoc tests (Pallant, 2017). In order to control the internal validity of the Survey, sample selection, data collection tool, and subjects' background, the interaction effect was controlled (Büyüköztürk et al., 2015). In addition, the effect of sampling and the effect of expectations were controlled for external validity. The last item of the questionnaire was subjected to content analysis because the teachers wrote their opinions on the subject. Content analysis is organizing and interpreting similar data in a way that the reader can understand by bringing together certain concepts and themes. In this respect, it was thought that presenting the data in codes, categories, and themes would be appropriate. Additionally, the percentage of consistency between the comments of the two researchers in the categorization and interpretation of the data was 88%, and the coding was accepted as reliable (O'Connor & Joffe, 2020).

Ethical considerations

Participants were informed about the study and their consent was obtained. They can participate in any part of data collection. Personal data of the participants were not collected. They have been informed about this issue regarding confidentiality. It has been explained that the participants have the right to withdraw and change their answers after completing the questionnaire electronically. All data is hosted on the first researcher's personal computer and is protected by a password.

In this study, all rules stated to be followed within the scope of "Higher Education Institutions Scientific Research and Publication Ethics Directive" were followed. None of the actions stated under the title "Actions Against Scientific Research and Publication Ethics", which is the second part of the directive, were not taken.

Ethical review board name: Istanbul Aydin University Education Sciences Ethics Committee

Date of ethics review decision: 24.06.2022

Ethics assessment document issue number: Number: E-45379966-020-55230.

RESULTS

The findings of the research are grouped and presented in four categories. It consists of teachers' rights, taking into professional accountability, scientific studies about the law, teachers' ideas about the law, and teachers' opinions about their professional development. There is also an overall assessment. The findings of the comparison tests of teachers' opinions regarding various variables are presented. In the last part, the open-ended opinions of the teachers were evaluated.

Only 12.8% of the teachers reported no idea about the new professional law. This rate showed that the majority of the teachers had an idea about the new law and they were interested. If a general evaluation is made about the teachers' views on the new professional law, and when the answers given by the participants to the survey items are scored, $\bar{X}$ =35.66 was found. This shows that teachers have an average view of the new professional law and do not express an extreme view.

Opinions of Teachers on Personal Rights

Teachers' views on personal rights, a sub-dimension of the new professional law, are shown in Table 1 below.

Table 1

Responses of teachers to items related to personal rights

Item No	Item	I don't agree at all	I disagree	I am undecided	I agree	I totally agree	$\bar{X}$
1	The new teaching law will lead to improvements in the personal rights of teachers.	23.3%	28.5%	23.2%	22%	2.9%	2.52
5	The changes in the new law are based on concrete needs.	23.8%	28.3%	20%	23.9%	3.3%	2.54
12	I think that with the new teaching law, the prestige of the teaching profession will increase.	35.8%	32.8%	16.9%	12.2%	1.8%	2.11
	Overall Average						2.39

Table 1 shows the percentages and averages of the answers reflecting the teachers' opinions about personal rights. The average of the answers of the teachers regarding the

survey items was found to be 2.39. This result shows that teachers' opinions on personal rights are generally gathered on the option "I do not agree at all". It leads to the conclusion that teachers disagree with the contribution of the new professional law to their rights. It is seen that most teachers believe that the new professional law will not cause a positive development in their rights. Significantly, 68.6% of the teachers stated that the new professional law would not increase the prestige of the teaching profession. Most teachers reported that the new professional law could not improve their rights and would not increase the profession's prestige.

Opinions of Teachers on Scientific Studies on Law

Teachers' views on professional, scientific studies about the new law are shown in Table 2 below.

Table 2

Responses of the teachers to items about the scientificity of the new law

Item No	Item	I don't agree at all	I disagree	I am undecided	I agree	I totally agree	$\overline{x}$
2	I think the new law has been discussed before it goes into effect.	45.9%	30.9%	12.8%	7.8%	2.4%	1.90
4	The changes in the new law are based on scientific data.	30.3%	30.7%	26.5%	10.1%	1.8%	2.22
6	I think the necessary preliminary research on the new law has not been done.	7.8%	14.2%	13.3%	35.1%	29.1%	3.64
8	I think the teachers were consulted enough when the law was being made.	48.3%	27.1%	9.5%	7.8%	7.1%	1.98
	Overall Average						2.43

Table 2 shows the percentages and averages of teachers' answers reflecting their views on professional, scientific studies about the new law. The average of the teachers' answers regarding the questionnaire items was 2.43. This result shows that the teachers thought the new law was developed without being based on scientific studies before and after its enactment. Table 2 shows the percentages and averages of teachers' answers reflecting their views on professional, scientific studies about the new law. The average of the teachers' answers regarding the questionnaire items was 2.43. This result shows that the teachers

thought the new law was developed without being based on scientific studies before and after its enactment. 76.8% of the teachers stated that the new professional law was not discussed sufficiently, 61% stated that it was prepared without relying on scientific data, and 75.4% of them stated that the teachers' opinions were not taken. Teachers generally think that the law was prepared and entered into force without being based on scientific data and without taking teachers' opinions.

Teachers' Opinions on Law Regarding Their Professional Development

Table 3 shows teachers' views on the new law's impact on their professional development.

Table 3

Responses of teachers to the items of the new law on Professional Development

Item No	Item	I don't agree at all	I disagree	I am undecided	I agree	I totally agree	$\overline{\mathrm{x}}$
7	I think the new law has eliminated many of the drawbacks.	26.7%	33.6%	22.9%	13.6%	3.2%	2.33
10	I believe that the new law will make the teaching profession more attractive.	36.4%	30.3%	16.3%	14.5%	2.1%	2.15
14	I am thinking of doing a master's or doctorate when the law comes into force.	26.4%	28.5%	24.8%	14.9%	5.1%	2.44
	Overall Average						2.30

Table 3 shows the percentages and averages of teachers' answers reflecting their views on the contribution of the new law to their professional development. The average of the answers of the teachers regarding the questionnaire items was found to be 2.30. This result shows that teachers' views on the contribution of the new law to their professional development are generally focused on the option "I do not agree."In general, it has been shown that they believe that the new professional law cannot provide a sufficient contribution to the professional development of teachers. Moreover, it is far from encouraging in this regard. When the new professional law came into force, only 20% of the teachers said they planned to do postgraduate education. This shows that the new professional law does not encourage professional development at the desired rate.

Teachers' Views on the Law

The general views of teachers about the new professional law are shown in Table 4 below.

Table 4

General opinions of teachers about the new law

Item No	Item	I don't agree at all	I disagree	I am undecided	I agree	I totally agree	$\overline{\text{x}}$
3	I find such an application carried out without a pilot application wrong.	5.6%	16.9%	19.6%	29.7%	28%	3.58
9	The new teaching law will lead to unethical practices.	3.2%	12.5%	24.2%	30.3%	29.7%	3.71
11	Those who prepared this law made arrangements according to their political preferences.	7.7%	20.3%	29.8%	22.1%	19.8%	3.26
13	I support the new law.	28%	23.8%	26.2%	18.4%	3.3%	2.45
	Overall Average						3.25

Table 4 shows the percentages and averages of teachers' opinions about the new professional law. The average teacher's answer about the new professional law was 3.25. This result shows that teachers' opinions about the new professional law generally focus on the "I am undecided" option. This situation shows that teachers' opinions on whether the new professional law helps meet the needs, implementation, and regulation are moderate. While 60% of the teachers stated that the new law would lead to unethical practices, 41.9% thought the regulation was based on political preferences. Only 21.7% reported that they supported the new professional law. Teachers generally do not support the new professional law, but they think it will lead to unethical practices.

Evaluation of Teachers' Opinions

The attractiveness of the teaching profession and the improvement of the teaching profession's rights are determined by gender, seniority, education level, and geographic location of the teacher's region variables.

Table 5

U test results of teachers' views on the new professional law in terms of gender variable

Items	Gender	N	Mean Rank	z	U	p
Do you know enough about the new law of profession?	Female	379	351.48	-3.23	46813	.001
	Male	285	307.20			
I am thinking of doing a master's or doctorate when the law comes into force.	Female	379	324.61	-1.107	51016	.260
	Male	283	340.73			
Those who prepared this law made arrangements according to their political preferences.	Female	378	329.57	-.15	52945	.881
	Male	282	331.75			
The changes in the new law are based on scientific data.	Female	379	313.90	-2.82	46689	.005
	Male	281	353.85			
I believe that the new law will make the teaching profession more attractive.	Female	379	324.66	-1.03	51089	.302
	Male	284	339.47			
The new teaching law will lead to improvements in the personal rights of teachers.	Female	379	325.50	-1.32	51376	.300
	Male	284	340.60			
I support the new law.	Female	378	324.75	-1.08	51126	.280
	Male	284	340.48			

When teachers' views on the new professional law were compared with the U test regarding gender, no statistically significant difference was observed in many variables (p> .05). However, do you know enough about the new law? [U=46813.5, z= -3.23, p< .05] and the changes in the new law are based on scientific data [U=46689.5, z= -2.82, p< .05] opinions created a statistically significant difference in favor of women in terms of gender. It has been observed that female teachers have more information about the new professional law than their male colleagues. In addition, the opinion that the new professional law is prepared based on scientific data is more dominant among female teachers than their male colleagues.

The Kruskal Wallis H test was applied to determine whether there was a significant difference between the teachers' views on the new professional law regarding their professional seniority. The results are shown in Table 6.

Table 6

The results of the examination of teachers' professional seniority and their views on the new professional law

Item	Seniority	N	Mean Rank	sd	X^2	p	Sig.
Do you know enough about the new law of profession?				5	2.226	.811	
	1-5	44	365.45				
	6-10	133	368.08				
I am thinking of doing a master's or doctorate when the law comes into force.	11-15	114	346.17	5	19.236	.002	2-5
	15-20	123	343.24				
	20-25	128	303.73				
	26+	120	282.17				
Those who prepared this law made arrangements according to their political preferences.				5	6.486	.269	
The changes in the new law are based on scientific data.				5	12.054	.038	
I believe that the new law will make the teaching profession more attractive.				5	12.435	.029	
The new teaching law will lead to improvements in the personal rights of teachers.				5	3.301	.650	
I support the new law.	1-5	44	365.32	5	13.605	.001	2-5
	6-10	132	354.35				

11-15	114	336.50	
15-20	123	281.08	
20-25	128	325.77	
26+	121	346.89	

As seen in Table 6, it is seen that there is a significant difference between the seniority of the teachers and the postgraduate education and support of the new professional law according to the opinions of the teachers about the new professional law. [X^2(5) = 19.236; 13,605, p< .0033]. Mann Whitney U test was performed on the groups' paired combinations to determine which groups favored the difference observed. As a result of these tests, it was seen that there was a significant difference between teachers with 6-10 years of seniority and teachers with 20-25 years of seniority and in favor of those with less seniority. This situation shows that teachers with less seniority will do postgraduate education with the new professional law.

The Kruskal Wallis H test was conducted to determine whether there was a significant difference between the teachers' views about the new professional law in terms of the variables of the level of education they work for. The results are shown in Table 7.

Table 7

Views of the teachers about the new professional law in terms of the variables of the level of education they work

Item*	Level of Educational	N	Mean Rank	sd	X^2	p
	Pre	143	125.59			
	Primary	34	99.76			
Do you know enough about the new law of profession?	Secondary	36	87.92	3	14.009	.003
	High	16	113.59			
Those who prepared this law made arrangements according to their political preferences.	Pre	143	116.45			
	Primary	34	127.70	3	7.806	.050

Secondary	36	90
High	16	131.31

*Only statistically significant items are given in the table. No statistical significance was found in the comparison test for other items.

As can be seen in Table 7, it was found that there was a significant difference between knowing the law and the steps that the teachers worked on according to the opinions of the teachers about the new professional law [$X^2(3) = 14.009$, p < .008]. Mann Whitney U test was performed on the groups' paired combinations to determine which groups favored the difference observed. As a result of these tests, it was seen that there was a significant difference between primary school teachers and secondary school teachers in favor of secondary school teachers in terms of knowing the new professional law [U=21025, z= -2.635, p< .008]. This shows that secondary school teachers have more information about the new professional law than primary school teachers.

No statistically significant difference was found in the Kruskal Wallis H test result, which was conducted to determine whether there is a significant difference between the teachers' views on the new occupational law in terms of the geographical region they live in.

Evaluation of Teachers' Opinions

The answers given by the teachers to the open-ended last item of the questionnaire were analyzed and presented by the researchers. The most frequently expressed theme by the teachers was that the teachers' opinions were not taken while the new professional law was being prepared. In this regard, it was seen that the teachers who expressed various opinions also mentioned this issue.

"It was prepared as desk research, unaware of the requirements, conditions, and the field of the teaching profession."

One of the most frequent criticisms of the new professional law of teachers was that the titles of the chartered and head teacher were given by considering other issues instead of seniority.

"I am no different from a teacher who has just started my profession these days when I am working on the 20th year of my teaching profession; our conditions are the same, I do not find a different coefficient in salary appropriate. Those who have completed ten years should be given the title of "chartered," and those who have completed 20 years should be given the title of "headteacher"." Otherwise, it would be an injustice."

Another theme that teachers frequently mention is the test anxiety that comes with the new professional law. Teachers reported that they had serious concerns about taking this

exam. It is also seen that teachers with high seniority declare that they are at a disadvantage compared to younger teachers. On the other hand, some teachers stated that they thought this exam was appropriate and that they would separate knowledgeable working teachers from others.

> *"The teaching profession law was necessary, but a career planning tested would bring many negativities."*

> *"Teachers are tired of exams."*

One of the issues that the senior teachers emphasized the most was the chartered, and head teacher exams held only once in the past years. Teachers have expressed that this situation leads to injustice regarding their salaries. In addition, it was stated that the current chartered and head teachers have no distinctiveness.

> *"In 2006, a career advancement exam was held, and the teachers who took the exam became chartered. A great injustice has been caused by not repeating the exam. In 2022, the teaching profession law is enacted, and the problem has not been resolved, and the path to head teachers is opened for these friends who have been chartered for 16 years by chance."*

Another point teachers focus on is that the expected time between chartered and head teacher progress payments is long. The fact that especially senior teachers deserve their retirement during these waiting periods and that some will retire due to the age limit creates confusion.

> *"When will I become a headteacher, my teacher of 22 years, in the 32nd year? I do not want a headteacher position after I retire."*

One of the most common views among teachers' answers to the open-ended item was that the scope of the new professional law was narrow. It has been emphasized that there is a law that cannot end the discrimination of paid, contracted, and permanent teachers and that only monetary compensation is given to improve personal rights. The professional reputation of teachers is not improved. In the law articles, ignoring teachers working in private schools was also met with regret. In addition, some teachers said they find the wage increase to be given with chartered and head teacher positions less.

> *"Sanctions imposed for the violence against teachers, teachers working in disadvantaged areas, tuition fees, additional lessons, duty on duty, postgraduate studies only, projects in their field, teachers working in national studies, and non-objective assignments were not mentioned at all. There are only career ladders in it."*

> *"What we wanted from personal rights was not an improvement in the salary, but the protection of the teacher from parent violence and administrative pressure. It was about increasing the reputation."*

Teachers stated that postgraduate education is far from being encouraged with the new professional law. In addition, many teachers stated that seniority should be considered instead of graduate education. Teachers with postgraduate education, on the other hand, reported that they could not get the full reward for their efforts. Many teachers stated they could not find the strength to do postgraduate education.

"My teacher of 20 years, I did my doctorate, but if there is no correction in the regulations, I will only be able to become a specialist teacher. In this sense, my difference from a 10-year-old teacher who has not completed a master's degree is that I do not take the exam, which does not provide any advantage for me."

"I think there will be serious distinctions between teachers in schools. Why is it a criterion to have a master's degree out of the field?"

In addition, some teachers stated that the contributions made to the project, competitions, promotion, and development of the school should also find a response in the new professional law, and they drew attention to a shortcoming.

"I think it has some shortcomings. Especially regarding the service points given to teachers who had a master's degree and carried out an e-twinning project in the previous period. Again, I believe that these issues should be reflected in the service score."

On the other hand, some teachers complained that sufficient information was not provided about the new professional law. On the other hand, some teachers stated that the new professional law is necessary and a good step as a start, although they do not think it is entirely sufficient. Some teachers have declared that they support the new professional law.

"It is nice to have a law despite its shortcomings. It will be updated in the future, and its deficiencies will be corrected."

"It is not a teaching profession law, it is a professional development law for teachers, but it is good. Maybe some of our colleagues who do nothing but complain can get out of their comfort zone. I think teachers should be tested."

On the other hand, some teachers emphasized that it would be appropriate to take the opinions of the teachers with different instruments similar to this study, and they approved the necessity of this study.

"I think that good results would be obtained with surveys in such e-learning environments. I think this study is a good example."

CONCLUSION

According to the research findings, the teachers' opinions about the new law of profession were generally gathered on the "I am undecided" option. This indicates that they

are generally hesitant about the new occupational law. 87.2% of the teachers said they had an idea about the new professional law. This indicates that teachers are interested in the new law and follow the process.

Teachers think that the new law will not contribute to their rights. In addition, teachers stated that the new professional law would not increase the prestige of the teaching profession (68.6%). Teachers think that the new professional law will not improve their rights and will not increase the profession's prestige. While teachers in Germany, France, and Turkey are civil servants; teachers are public employees in Finland and England, they are not civil servants (MoNE, 2006). In all the countries mentioned, except Turkey, teaching is seen as a profession with high status and above the middle-income level (Varkey Foundation, 2018). However, in our study, it was stated that the teaching profession in Turkey is not at a reasonable level in terms of both status and income, according to teachers' views. Countries with good PISA scores find their education systems more successful (Varkey Foundation, 2018). Compared to the countries participating in the PISA research, it is seen that teachers and the teaching profession still have a very decent place in Turkey, contrary to popular belief (Varkey Foundation, 2018) and it has a serious place in people's future plans and dreams (Göker & Gündüz, 2017). However, the teachers who participated in the research did not express positive opinions about the prestige of their profession. In terms of OECD member countries, it is seen that the status and personal rights of teachers are not in a more privileged position than other professional groups that can be considered peers (EURYDICE, 2018). Teachers in Turkey are not far behind other countries in terms of status and personal rights but are seen ahead in some subjects. Can (2015) states that the lack of career plans for administrators and teachers and the inadequacy of the supervision system are the qualitative barriers to the Turkish Education System. In line with the opinions of the teachers, it was determined that they did not consider the professional law to regulate their status and personal rights positively.

They think teachers were developed without being based on scientific studies before and after the new law came into force. Teachers think that the new professional law is not discussed enough (76.8%), it was prepared without relying on scientific data (61%), and it was put into effect without asking the opinions of their colleagues in the kitchen (75.4%). According to teachers, the new professional law does not encourage professional development. When the new professional law was enacted, most teachers said they did not plan to do postgraduate education (80%). This indicates that the new professional law does not encourage professional development at the desired rate. More than half of the teachers (60%) think that the new law will lead to unethical practices, state that it is regulated according to political preferences, and do not support the new professional law. It is seen that the rate of those who support the new occupational law is relatively low (21.7%). Teachers generally do not support the new professional law but believe it will lead to unethical practices. As expressed in the theoretical framework, the low number of

supporters of the new occupational law suggests resistance to change at first glance. However, the statistical result may indicate a situation beyond resistance to change.

Regarding gender variables, it has been determined that female teachers have more information about the new professional law than their male colleagues. They believe that the new professional law is prepared based on scientific data. It has been observed that the rate of support for new professional law is higher for teachers with less seniority than those with more seniority. Similarly, it has been revealed that teachers with less seniority are more willing to do postgraduate education. In other words, as seniority and age increase, the idea of taking graduate education decreases. It has been observed that secondary school teachers have more information about the new professional law than primary school teachers. Finally, there was no significant difference between teachers' opinions about the new professional law regarding the geographical region variable they live in.

The new professional law did not receive the necessary support from teachers. The main reasons for this may be that they thought it would not contribute to their rights and that this law was organized without consulting the teachers. In addition, according to teachers' opinions, exam anxiety is one of the most important reasons for reacting to the new law. Another standard view is that the title should be given by considering only seniority. Although there is a resistance to change with the new occupational law, statistical data shows a situation beyond this. Considering this prepared law as the first legal step toward the teaching profession, organizing a professional law is seen as actual progress. In the light of this and similar studies, it is clear that the law should be developed by considering the opinions of all education stakeholders, especially teachers. While the evaluation results of teachers do not have much effect on teachers' wages and career advancement in Turkey, Austria, Belgium, France, and Switzerland, they have serious effects in Denmark, the Netherlands, and England (Göker & Gündüz, 2017). When the new professional law is examined, it is seen that this situation is mostly mentioned, but the opinions of the teachers show that they oppose this regulation examination. In the study, it is seen that teachers do not offer a different alternative to the exam. In Germany, France, and Turkey, appointments to the teaching profession are made through central examinations, and in England and Finland, teacher candidates' postgraduate degrees, internship training achievements, and teaching skills are taken into account. Although the professional law in Turkey does not regulate this teacher appointment process, it is understood that it encourages in-service professional development opportunities. However, teachers state that they do not see it as a professional development opportunity, on the contrary, it creates an exam and success indexed situation.

It is seen that this situation is ignored in Turkey, where practice is given importance in the process of teacher training and professional development in Germany, Finland, France and England, which are among the OECD countries (Aykaç, Kabaran & Bilgin, 2014). Although the new professional law encourages the professional development of teachers by

aiming to help regulate this situation, teachers' opinions show that they do not believe in this situation much.

RECOMMENDATIONS

As stated in the literature, while the rate of postgraduate teachers in Turkey does not exceed 10%, this rate is relatively high in OECD member countries. The new professional code can be an excellent incentive to catch up with OECD member countries. In addition, the literature clearly states that these successes of prosperous countries in international exams are due to teachers who have received postgraduate education. In this respect, a new professional law should be developed to offer more promising opportunities to teachers. Although the lack of support of teachers, who seem to have enough knowledge about the new professional law, is seen as a resistance to change at first glance, statistical results point to a different situation. In this respect, resistance to change may be the subject of a separate study. It can be thought that it would be beneficial to get teachers' opinions through in-depth qualitative research for groups with statistically significant differences in this study. In this respect, it can be used as a guide for in-depth research on which groups and research problems to examine.

As of May 12, 2022, it was seen that the regulation of the new law published by the Ministry of National Education did not eliminate the deficiencies expressed by the teachers in our study. It has been determined that the score to be considered successful in the exam to be held with the regulation is 70/100 and how many times it will be done in a year. An additional positive statement is that private school teachers and those working in other public institutions will be able to apply for the written exam. In addition, it was stated that the weight of the exam subjects, the number of questions to be asked, and the point value would be determined by the central exam commission. In this respect, it is seen that there is a need for various studies based on social media platforms, in which the opinions of teachers can be brought to the fore more after the exam.

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The Prediction Level of Teachers' Perceptions of Psychological Empowerment on Job Satisfaction and Organizational Citizenship Behaviors

Ramazan ERTÜRK [1]

Abstract:

The purpose of this study is to determine the prediction level of teachers' psychological empowerment perceptions on their job satisfaction and organizational citizenship behaviors. The research is designed in the relational survey model. 400 teachers working in primary schools in Bolu, Turkey participated in the study and out of 356 teachers participating in the study voluntarily, 314 scales were delivered back and evaluated. Psychological Empowerment Scale, Job Satisfaction Scale and Organizational Citizenship Scale were used as data collection instruments. The findings indicated that teachers' perceptions of psychological empowerment were moderate in self-determination, and high in other dimensions and the whole scale. The moderate level of teachers' perceptions of job satisfaction and organizational citizenship is a striking and concerning result. When teachers do not have high level of job satisfaction, their performance will decrease, and it will be difficult for these teachers to exhibit organizational citizenship behavior. In the study, that the teachers' perceptions of psychological empowerment affect both job satisfaction and organizational citizenship behaviors necessitates the importance of psychological empowerment in increasing teachers' job satisfaction and organizational citizenship behaviors. In this sense, it is an important finding that teachers' job satisfaction and organizational citizenship behaviors will be increased by means of them having self-determination over their work, increasing their competence, making them influential by allowing to think, talk about and intervene the incidents that occur in the school, and ensuring their participation in work-related decisions. The finding indicating that teachers' perceptions of psychological empowerment play an important role in increasing their job satisfaction and organizational citizenship behavior reveals the authenticity of the research.

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INTRODUCTION

One of the issues that organizations must deal with is their efforts to protect their own assets in the situation of harsh competition brought about by globalization and the ability to cope with rapidly changing information and technological innovations. It is one of the main tasks of the organization to make employees feel that they are part of the organization and benefit from them more effectively and efficiently. Today, psychological empowerment is an important management technique for organizations in order for the employees to easily demonstrate their creativity and skills and utilize their experiences and knowledge. Psychological empowerment can make the employees view their work more meaningful, give them the chance to plan and implement their work, show them that they can have a certain impact on their decisions and make them feel more competent and powerful within the organization. Psychologically empowered employees can see themselves as an asset for the organization and feel safe within it. Working covers a long period of the lives of individuals. The fact that the individuals spend most of their day working means that they integrate themselves with the work and get affected by that. Therefore, the compatibility and happiness of the individuals in work life is an indicator of the degree to which they reach their job satisfaction at the end of the day. Job satisfaction is defined as the pleasure, happiness or satisfaction that the individuals receive from their work. If they are satisfied with their work, they can establish a bond with the organization, which leads to showing themselves comfortably (Demiray, 2018). Therefore, the employees' perceptions of psychological empowerment will contribute to job satisfaction and organizational citizenship behaviors.

Psychological Empowerment

The concept of empowerment has become a popular management approach through the development and change in organizations in recent years. Empowerment is a process with behavioral and psychological dimensions. While behavioral empowerment focuses on administrative practices in employee empowerment, psychological empowerment focuses on whether the employees feel empowered (Ertürk, 2021a). In many studies, the importance of psychological empowerment has been emphasized (İşcan & Çakır, 2016). Spreitzer (1995) examined the psychological empowerment in four dimensions: *meaning* resulted from the employees' experiencing the success of empowerment activities, *competence*, *self-determination* and *impact*. *Meaning* is defined as the value judgements towards the purposes and objectives of the work in relation to the employee's own ideals and standards; *competence* accounts for the self-belief that the employee can do the job successfully having the skill and capability; *self-determination* is the employee's ability to make decisions about what methods to use during the execution of the work, the speed of it and the effort to be performed without consulting the administrator; *impact* is defined as the degree to which the employee can influence the strategy, method and results of the work (Spreitzer, 1995). Psychological empowerment makes individuals' work more

meaningfully, gives them the opportunity to plan and implement their work freely, influence these decisions by incorporating them into the decision-making process within the organization, and use and develop their skills to the extent required by their work. The employees who feel psychologically empowered develop feelings of trust and perceive themselves as valuable to the organization. The employee who feels valued and safe within the organization will view their work more meaningful and will be able to show their abilities, knowledge and skills more easily when facing the problems (Karakuş, 2019).

Psychological empowerment has gained importance with changes in administration through the provision of organizational development in schools. The psychological perceptions of teachers which is the most important component of the educational organization have a big role to play in achieving this development. The teacher who does not only have the role of conveying information is the person who constantly updates the behaviors, attitudes and information of the people in the organization according to the requirements of the era and add this to the organization. The more the teachers' perceptions are improved by the administrators, the more the success of the teacher and the quality of the education will increase. In order to increase the teachers' perceptions, administrators will make the educational institution more efficient by empowering the dimensions of individual competencies, self-determination, the meaning of their profession and impact in the organization (Tanrıöğen, 2014).

Since the administrators will transfer more powers and responsibilities to the employees in the organizations with psychological empowerment practices, these employees will have new experiences and learn more as a result of the powers and responsibilities they receive (Doğan, 2019). Supportive behaviors of the administrators towards the employee empowerment positively affects the job satisfaction of employees (Podsakoff et al., 2000) and improves the organizational efficiency and productivity (Sheikhepoor & Sheikhepoor, 2015). Psychologically empowered employees see themselves as more capable, believe that they will affect their work in a meaningful and valuable way and feel happy and can create a spacious organizational climate by reflecting their positive feelings to their colleagues (Çavuşloğlu & Güler, 2016). In the related literature, psychological empowerment has been found to have a positive relationship with job satisfaction, organizational commitment, work performance, organizational citizenship behaviors and innovative behaviors, but have a negative relationship with turnover intentions and work stress (Seibert, Wang & Courtright, 2011).

Job Satisfaction

Job satisfaction explains the attitudes and expectations of the employee regarding their job and the organization (Miner, 1992), the pleasure and happiness that the employee gets from the job and the factors related to that. Job satisfaction which is the most investigated psychological variable refers to the attitudes towards the work (Tsai & Wu,

2008). It is a combination of the employees' emotions and thoughts towards the work, a positive or pleasant emotional situation that arises because of employees evaluating their work or experiences in the workplace and the result of the employees' perceptions of how much of what they think is important they obtain from their work (Akehurst, Comeche & Galindo, 2009). Job satisfaction can occur when the earnings of the work and the expectations of the employee comply with each other (Bingöl, 1990). If the employee is not doing a job that suits their interests and abilities, this will lead them to have discontent, discomfort and unrest after a certain period of time. In this case, talented and skilled people who work in the jobs that do not suit to their interests and abilities will experience symptoms such as feeling worthless, frustration, loose ties with life, tension and job dissatisfaction (Ada, 2014). The employees with job satisfaction come to work regularly, have low turnover intentions, and apply for fewer medical reports to take the day off. Therefore, the employees show up at work more voluntarily in the organizations where job satisfaction is provided (Erdoğan, 1996). By means of available job satisfaction, the employees' self-confidence, morale, performance and productivity will increase. Along with the effects that increase such positive aspects, mitigating effects will emerge in negative issues such as stress, anxiety, complaints and tension (Akşit Aşık, 2010). Whilethe performance of the employee and quality of work increase within the organization on the condition of increased job satisfaction (Özdevecioğlu & Doruk, 2009), in cases wherejob satisfaction is not achieved, negative aspects emerge in the employee such as low performance, absence, turnover intentions in cases of job dissatisfaction (Luthans, 2011).

Job satisfaction which is one of the most important aspects of organizational life is also very important for teachers because the satisfaction that the teachers get from their jobs will directly affect the younger generation in educational organizations that are the most important institution for a country. In addition, the fact that teachers have a higher level of stress when compared to other occupations is important considering job satisfaction (Kumaş & Deniz, 2010). Job satisfaction is necessary for a quality education (Taşdan & Tiryaki, 2008). Job satisfaction of teachers also affects the student success (Michaelowa, 2002; Patrick, 2007; Tek, 2014) Since the teachers with high job satisfaction have a higher commitment to work, they work harder for student success (Tek, 2014). This situation highlights the extra roles of teachers. Therefore, job satisfaction is one of the variables frequently correlated with organizational citizenship behavior (Wagner & Rush, 2000). Job satisfaction, which is an emotional reaction of the individual to work-related factors and organization shows consistent relations with organizational citizenship behavior (Turnipseed & Murkison, 2000). Organizational citizenship behavior is related to job satisfaction, so job satisfaction leads to organizational citizenship behavior (Kaskel, 2000; Kaplan, 2011). Job satisfaction is one of the significant organizational behaviors. because a highly satisfied individual will have positive attitudes and behaviors regarding the work being carried out (Gamsız, Yazıcı & Altun, 2013). This will allow the employee tobe positive about the work and make extra efforts for it. Therefore, it is considered that

high job satisfaction of teachers will also affect organizational citizenship behaviors since the satisfied teachers are expected to fulfill extra role apart from the requirements of the work routine.

Organizational Citizenship

One of the features of organizational citizenship behavior which was first used by Bateman and Organ (1983) in the literature is that they are not formally rewarded by the organization (Dipaola & Neves, 2009). Organizational citizenship behavior basically consists of altruism, sense of ownership and behaviors without waiting for recompense (Deluga, 1995). Organizational citizenship behavior is defined as extra-role behaviors of the employees in the work environment beyond existing standards and job definition (Organ, 1988), the voluntary behaviors of the employees to contribute to the organization going beyond the requirements it formally sets (Schnake & Dumler, 2003) and doing more than required (Greenberg & Baron, 2000). Organizational citizenship behavior is behaviors contributing to work environment psychologically and socially apart from the related technical efforts (Blakely, Andrews & Moorman, 2005). The concept of organizational citizenship behavior focuses on individual behaviors with voluntary basis which help achieve organizational objectives contributing to the social and psychological environment of the organization (Lievens & Anseel, 2004). Apart from the job requirements, that the members of the organization contribute to organizational activities of their own desires, that help other colleagues voluntarily and make extra efforts for other work is within the scope of organizational citizenship behaviors along with similar sacrifices made on behalf of the organization, which is all very important for the success of the organization (Sezgin, 2005). Organizational citizenship behaviors increase cooperation within organizational life, help employees develop feeling of responsibility and ensure that members of the organization have positive thoughts (Şenturan, 2014). Employees who exhibit organizational citizenship behavior can increase the organizational efficiency by making the organization a more convenient place, using opportunities more effectively and efficiently, establishing more positive relationships and showing more extra role behaviors(Özler, 2012).

Organizational citizenship has a significant impact on the potential of the organization to achieve its goal in schools as in all organizations. In the schools with a highlevel of organizational citizenship behaviors, the teachers strive to improve themselves in order to meet the needs of students and contribute to the school in reaching its goals more effectively and rapidly (Avcı, 2015). Teachers who exhibit organizational citizenship behavior in schools cooperate with their colleagues with high workloads, help them in the preparation of classes, work on boards and commissions, gain expertise in areas that contribute their profession, prepare extra assignments suitable for the proficiency level of students, and participate voluntarily in extracurricular activities (Bogler & Somech, 2004; DiPaola, Tarter & Hoy, 2005). Organizational citizenship behaviors may vary depending

on many factors such as the characteristics of the employee, task, organization or leader etc. (Podsakoff et al., 2000) As a result, teachers' organizational citizenship behaviors are expected to be affected by their perceptions of psychological empowerment.

When the research conducted in Turkey and abroad on teachers' perceptions of psychological empowerment are examined, psychological empowerment is based on trust in the school principal (Freire & Fernandes, 2014; Moye, Henkin & Egley, 2005), organizational commitment (Dee, Henkin & Duemer 2002; Chen et al., 2007; Balçık, 2018; Akkoç, 2019), organizational citizenship behavior (Aksel, Serinkan, Kızıloğlu, & Aksoy, 2013; Bogler & Somech, 2004; Shapira-Lishchinsky & Tsemach, 2014), work engagement (Örücü & Hatipoğlu, 2018), job performance (Spreitzer et al., 1997), intention to leave (Podsakoff et al., 2000), organizational efficiency and productivity (Sheikhepoor & Sheikhepoor, 2015). It is thought that it is important for teachers, who have important duties and responsibilities such as educating future generations and directing their lives, to see their work as meaningful, to believe that they have the competence required by their work, to be autonomous while doing their work and to have an impact on the outputs related to their work. It is thought that the job satisfaction and organizational citizenship behaviors of teachers who have the knowledge and skills required by the teaching profession, who believe that their job is meaningful, who have self-control over their work and who feel that they are effective on their work outputs, will be at a high level. In this sense, revealing the predictive power of teachers' psychological empowerment perceptions on both their job satisfaction and organizational citizenship behaviors indicates the originality of this research. In addition, the scarcity of research on teachers' perceptions of psychological empowerment in Turkey makes this research important as the results of the research will guide school administrators, policy makers and decision makers in teacher empowerment. Therefore, the aim of this study is to determine the predictive power of teachers' perceptions of psychological empowerment on their job satisfaction and organizational citizenship behaviors. The study is designed in the relational survey model to demonstrate the predicting level of the independent variable (teachers' perceptions of psychological empowerment) on dependent variables (job satisfaction and organizational citizenship behaviors). Thereby, the following questions are addressed for answers:

1) What is the level of the teachers' perceptions of psychological empowerment, job satisfaction and organizational citizenship?

2) Are there statistically significant relationships among the teachers' perceptions of psychological empowerment, job satisfaction and organizational citizenship?

3) Are the teachers' perceptions of psychological empowerment predictor of their job satisfaction?

4) Are the teachers' perceptions of psychological empowerment predictor of their organizational citizenship behaviors?

METHOD

Research Design

In this research, relational survey model as a quantitative research method was used. The purpose of using this model is to find out the thoughts and attitudes of the teachers participating in the study and determine the level of the relationship between the variables through strong statistical techniques such as regression (Balcı, 2013). This research was ethically approved after being evaluated at the meeting of the Human Research Ethics Committee of Bolu Abant İzzet Baysal University, dated 29.04.2021 and numbered 2021/04.

Participants

400 teachers working in primary schools in Bolu, Turkey were determined as the participants of the study. As all the participants were contacted successfully, no samples were taken. The subjects participated in this study voluntarily. Of 356 participatory teachers, 314 scales were delivered back and evaluated.

Data Collection Tools

Psychological Empowerment Scale, Job Satisfaction Scale and Organizational Citizenship Scale were used to collect the data.

Psychological Empowerment Scale

Psychological Empowerment Scale, which was developed by Spreitzer (1995), adapted by Sürgevil, Tolay and Topoyan (2013) consists of 4 dimensions which are *meaning*, *competence*, *self-determination* and *impact* and has 3 items under each dimension. This scale was graded with 5-point Likert type as in *1-strongly disagree, 2-disagree, 3-neutral, 4-agree, 5-strongly agree*. Sürgevil et al., (2013) calculated the Cronbach Alpha coefficient as .84 in *meaning*, .85 in *competence*, .85 in *self-determination*, and .90 in *impact*. As for this study, the Cronbach Alpha coefficient was calculated as .87 in *meaning*, .86 in *competence*, .88 in *self-determination* and .91 in *impact*. Depending on the reliability score, thescale is considered reliable because the reliability scores of the dimensions in all structures are over Cronbach α=0.70.

Job Satisfaction Scale

Job Satisfaction Scale, which was developed by Ho and Au (2006) and adapted to Turkish by Demirtaş (2010) consists of 5 items and one dimension. The Cronbach Alpha coefficient of the scale that was developed in a 5-point Likert type was calculated as .84 by Demirtaş (2010). In this study, the Cronbach Alpha coefficient was determined as .86 upon the reliability analysis. Therefore, it can be said that the reliability level of the scale is high.

Organizational Citizenship Scale

The scale, which was developed by DiPaola, Tarter and Hot (2005) was adapted to Turkish by Taşdan and Yılmaz (2008). Having 12 items and developed in 5-point Likert type, the scale has one dimension. The Cronbach Alpha score for the internal consistency was calculated as .85 in this scale, which was determined as .87. by Taşdan and Yılmaz (2008). So, it is concluded that the reliability coefficient of the scale is high. The scale which was developed in 5-point Likert is considered low between 1.00 and 2.60; medium between 2.61 and 3.40; high between 3.41 and 5.00.

Data Analysis

The data obtained in the research were analyzed in Statistical Package of Social Sciences (SPSS), version 20. As for the normality of the data, Skewness and Kurtosis coefficients were tested. Skewness and Kurtosis values of between +1.5 and -1.5 indicates that the data shows normal distribution (Tabachnick & Fidell, 2013). Accordingly, as the normality scores of Total Psychological Empowerment Scale (Skewness: -,466; Kurtosis: ,166), and sub-dimensions of *meaning* (Skewness: -1,180; Kurtosis: -,170), *competence* (Skewness: -,863; Kurtosis: ,007), *self-determination* (Skewness: -,709; Wolfosis: ,616) and *impact* (Skewness: -,119; Kurtosis: -,189), and also Total Job Satisfaction Scale (Skewness: -,257; Kurtosis: -,123) and Organizational Citizenship Scale (Skewness: -,257; Kurtosis: -,123) were between +1.5 and -1.5, the data were determined to have normal distribution. Thus, parametric tests were used in the analysis.

The autocorrelation problem among the variables was examined with the coefficient (d=1.99) and it was determined that there was no autocorrelation problem now that the Durbin-Watson coefficient is between 1.5 and 2.5 shows that there is no autocorrelation problem (Kalaycı, 2009). When the r coefficients between the variables were examined, they were found to be lower than .80. These results show that there is no multicollinearity problem between the independent variables since that the r coefficient among the independent variables is below 0.9 shows that there is no problem of multiple co-collinearity (Field, 2009; Tabachnick & Fidell, 2013). In addition, it was determined that the Variance Amplification Factor value varied between 3.28 and 5.91 (below VIF:10) and the tolerance values were between .47 and .84 (greater than 0.2). These obtained values show that there is no multicollinearity problem in the analysis (Field, 2009; Stevens, 2009).

Ethical considerations

The collection of research data was carried out electronically on the basis of the volunteers of the participants. No private information (name, surname, etc.) of the participants was requested. The data were kept confidential by the researcher. In this study, all rules stated to be followed within the scope of "Higher Education Institutions Scientific Research and Publication Ethics Directive" were followed. None of the actions

stated under the title "Actions Against Scientific Research and Publication Ethics", which is the second part of the directive, were not taken.

Ethical review board name: Human Research Ethics Committee of Bolu Abant İzzet Baysal University

Date of ethics review decision: 29.04.2021

Ethics assessment document issue number: 2021/04

RESULTS

In this section, the findings on teachers' perceptions of psychological empowerment, job satisfaction and organizational citizenship, the relationships between psychological empowerment, job satisfaction and organizational citizenship, and the predictive level of psychological empowerment on job satisfaction and organizational citizenship are given. Teachers' perceptions of psychological empowerment, job satisfaction and organizational citizenship are shown in Table 1.

Table 1

Teachers' Perceptions of Psychological Empowerment, Job Satisfaction, and Organizational Citizenship

Scales and Dimensions	N	$\bar{x}$	SS
Meaning	314	3.68	0.48
Competence	314	3.52	0.49
Self-determination	314	2.21	0.68
Impact	314	3.39	0.89
Total of Psychological Empowerment	314	3.28	0.51
Job Satisfaction	314	3.36	0.28
Organizational Citizenship	314	3.41	0.62

As Table 1 shows, teachers' perceptions of psychological empowerment were found at *high* level in the dimensions of *meaning* ($\tilde{x}$=3.68); *competence* ($\tilde{x}$=3.52), *impact* ($\tilde{x}$=3.39) and the total psychological empowerment scale ($\tilde{x}$=3.28), but at *moderate* level in *self-determination* ($\tilde{x}$=2.21). These findings show that teachers' perceptions of psychological empowerment are high in the dimensions of meaning, competence, impact and the whole scale, but moderate in self-determination. It is a remarkable finding that the teachers' perceptions of psychological empowerment are moderate in the dimension of self-determination. Teachers' perceptions of job satisfaction ($\tilde{x}$=3.36) and organizational citizenship ($\tilde{x}$=3.41) are moderate.

Pearson Correlation Coefficient results for the relationships between teachers' perceptions of psychological empowerment, job satisfaction and organizational citizenship are shown in Table 2.

Table 2

Pearson Correlation Coefficient Results for the Relationships Between Teachers' Perceptions of Psychological Empowerment, Job Satisfaction and Organizational Citizenship

Psychological Empowerment Scale and Dimensions		Job Satisfaction	Organizational Citizenship
Meaning	r	.71**	.75**
Competence	r	.70**	.74**
Self-determination	r	.73**	.79**
Impact	r	.64**	.67**
Psychological Empowerment	r	.72**	.77**
**p <0.05			

**p<0.05: Correlation coefficient as absolute value indicates a strong correlation between 0.71-1.00, a moderate correlation between 0.70-0.31, a weak correlation between 0.30-0.00 (Büyüköztürk, 2011).

Table 2 provides the magnitude and level of correlation between psychological empowerment with its dimensions and job satisfaction and organizational citizenship. According to the table, it was found that there was a strong positive relationship between the total of psychological empowerment scale (r=.72; p<0.05), the dimensions of *meaning* (r=.71; p<0.05), *competence* (r=.70; p<0.05), *self-determination* (r=.73; p<0.05) and *job satisfaction*; a moderate positive significant relationship between *impact* and *job satisfaction* (r=.64; p<0.05). Also, it was concluded that there was a strong positive relationship between the total of psychological empowerment scale (r=.77; p<0.05), the dimensions of *meaning* (r=.75; p<0.05), *competence* (r=.74; p<0.05), *self-determination* (r=.79; p<0.05) and *organizational citizenship*; and a moderate positive significant relationship between *impact* and *organizational citizenship* (r=.67; p<0.05)

The results of the multiple regression analysis for teachers' perceptions of psychological empowerment to predict their job satisfaction are presented in Table 3.

Table 3

The Results of the Multiple Regression Analysis for Teachers' Perceptions of Psychological Empowerment to Predict Their Job Satisfaction

Dependent Variable	Independent Variable	ß	t	p	F	p	R2
Job Satisfaction	Stability	1,11	3,86	0.00	76.36	0.00	0.76
	Meaning	0.68	0.33	0.00			
	Competence	0.59	4.84	0.00			
	Self-determination	0.86	5.42	0.00			
	Impact	0.77	4.03	0.00			
Job Satisfaction	Stability	1.128	9.06	0.00	82.04	0.00	0.79
	Psychological Empowerment	0.82	18.62	0.00			

As illustrated in Table 3, it was found that all sub-dimensions of psychological empowerment were significant predictors of job satisfaction (F=76.36; p<0.01), as well as total psychological empowerment scale being a significant predictor of job satisfaction (F=82.04; p<0.01). All sub-dimensions of psychological empowerment explained 76% of the total variance in teachers' perceptions of job satisfaction (R^2 =0.76), and the total of psychological empowerment scale explained 79% (R^2=0.79) of the total variance in teachers' perceptions of job satisfaction. p values indicated that the dimensions of meaning, competence, self-determination and impact and the total of psychological empowerment scale were significant predictor variables of teachers' job satisfaction (p<0.01). These findings suggest that teachers' perceptions of psychological empowerment have an effect on their job satisfaction. It could be concluded that when teachers see their work as meaningful, perceive that they are competent and self-determined to perform their job, and feel that they have an impact on the school, their job satisfaction will also increase.

The results of multiple regression analysis for teachers' perceptions of psychological empowerment to predict organizational citizenship behaviors are presented in Table 4.

Table 4

The Results of Multiple Regression Analysis for Teachers' Perceptions of Psychological Empowerment to Predict the Organizational Citizenship Behaviors

Dependent	Independent Variable	ß	t	p	F	p	R2
Organizational Citizenship	Stability	1,41	3,91	0.00			
	Meaning	0.79	2.48	0.00			
	Competence	0.75	3.71	0.00	80.12	0.00	0.83
	Self-determination	0.89	5.03	0.00			
	Impact	0.68	3.14	0.00			
Organizational Citizenship	Stability	1.07	8.03	0.00			
	Psychological	0.86	19.32	0.00	75.44	0.00	0.72

As illustrated in the table, it was found that the sub-dimensions of psychological empowerment were significant predictors of organizational citizenship (F=80.12; p<0.01), and also the total of psychological empowerment scale were significant predictor of organizational citizenship (F=75.44; p<0.01). All sub-dimensions of psychological empowerment explained 83% of the total variance in teachers' perceptions of organizational citizenship (R^2=0.83), and the total of psychological empowerment scale explained 72% (R^2 =0.72) of the total variance in teachers' perceptions of job organizational citizenship. p values showed that the dimensions of meaning, competence, self-determination and impact and the total of psychological empowerment scale were significant predictor variables of teachers' perceptions of organizational citizenship (p<0.01). These findings suggest that teachers' perceptions of psychological empowerment

have an effect on their perceptions of organizational citizenship. It could be concluded that organizational citizenship behaviors of the teachers will increase depending on the increase in their perceptions of psychological empowerment.

DISCUSSION

Teachers' perceptions of psychological empowerment are at high level in the dimensions of competence, impact, and the whole psychological empowerment scale but at a moderate level in self-determination. It is a positive result that teachers' perceptions of psychological empowerment are at a high level in the dimensions of meaning, competence and impact throughout the scale as by means of psychological empowerment, the employees increase their work performance; quality products and services emerge in a certain period of time as a result of the employees' taking their own responsibilities; the employees take more responsibility; creative and innovative thoughts emerge; the administrators take more time to do their important work (Baltaş, 2001); the employees take initiative and risk; innovation is encouraged; intra-organizational entrepreneurship and creativity increase and uncertainties are handled (Bakan, 2015). Employees with a high level of psychological empowerment perception can manage themselves with higher intrinsic motivation and be more efficient and productive in their work (Kanbur, 2017). In this context, it can be said that the job satisfaction and organizational citizenship behaviors of teachers with a high perception of psychological empowerment will increase. In the literature, it is possible to come across studies (eg., Altınkurt et al., 2016; Odabaş, 2014; Okan & Yılmaz, 2017; Taştan, 2014) in which it was concluded that teachers' perceptions of psychological empowerment are high and that are similar to the results of this research.

Teachers' having a high level of psychological empowerment in the dimension of meaning will enable them to display an extra role in addition to their official duties as a result of finding their jobs meaningful and increasing their job satisfaction. When the meaning that the employee adds to the work is low, he can be insensitive, indifferent and carefree to events, and when it is high, he is closely interested in his work (Balçık, 2018). This situation, on the other hand, will enable teachers to display an extra role in addition to their official duties because of finding their job meaningful and increasing their job satisfaction since the activities carried out in schools necessitate doing activities outside of the officially planned ones. For example, activities such as the celebration of certain days and weeks, values education, projects, etc. are what teachers do and participate in voluntarily. Therefore, it can be said that teachers' willingness to carry out these activities is closely related to their view of their work as meaningful. In addition, employees with a high level of significance are satisfied with their work and do their job with pleasure; this, in turn, can increase personnel empowerment and thus the effectiveness of the organization (Doğan & Demiral, 2009; Spreitzer, Kizilos & Nason 1997).

Teachers' having a high level of psychological empowerment in the dimension of competence will enable them to be self-confident and courageous about their work, thus, taking more initiative. It can be said that teachers who think that they have the competence related to their job are confident in their abilities. In addition, the perception of high efficacy can be interpreted as the belief that teachers have the capacity to perform the activities carried out at school. As a matter of fact, the fact that employees with competence based on skills and abilities do their jobs better improves their job satisfaction, job performance and loyalty, and reduces job stress and tension (Cho & Faerman, 2010). Employees with high competency make a high degree of effort and are persistent against obstacles. When employees have the knowledge, skills and abilities related to their jobs, they can perform their jobs in a flexible range of tasks (Muduli, 2017). All these will increase teachers' job satisfaction and organizational citizenship behaviors.

Teachers' having a high level of psychological empowerment in the impact dimension will increase teachers' motivation, job commitment, and thus, increasing their job satisfaction and organizational citizenship behaviors. The motivation of the employee who thinks that he has an impact on the work he has done in the organization, the energy and effort he spends for the organization increases, thus contributing to organizational efficiency by doing quality work in the organization. Thanks to the dimension of impact, it is thought that the work and decisions of the employee can be affected at every stage (Sigler & Pearson, 2000). According to Spreitzer, psychologically empowered individuals perceive themselves as active participants in shaping organizational outcomes, believing that their work has a significant impact on others and that their contributions are taken seriously. Employees with a high sense of control feel empowered to take action and experience less burnout (O'Brien, 2010). Therefore, the job satisfaction and organizational citizenship behaviors of these employees will increase. Considering that teachers are at an important point in the quality education and training activities, the positive results of these activities and the fact that they think or feel they have an impact on the success of the student and the school will increase their job satisfaction and motivation, thus, enabling them to work more diligently. In addition, teachers who believe that they have control over the activities will feel empowered and will be more willing to do their work.

It is a remarkable finding that the teachers' perceptions of psychological empowerment are moderate in the dimension of self-determination. That the teachers' perceptions of psychological empowerment are moderate in the dimension of self-determination can be interpreted that their free and independent act in doing their work and their participation in the decision-making process is limited. However, this can cause educational activities that require teachers to work autonomously to occur in a vicious circle since self-determination allows teachers to use their decision-making skills and professionalism in line with different paradigms, know what, how and why they are doing, and pass this notion onto their colleagues. Self-determination offers employees

many contributions such as freedom to choose alone, creativity, flexibility, convenience, entrepreneurship, self-regulation and taking initiative. When not given self-determination, employees will feel being controlled, experience emotional distress, thus, having stress and lose of motivation, and their self-esteem will be affected negatively (Thomas & Velthouse, 1990). The idea of self-determination basically suggests that teachers should have a certain area of authority and freedom in work-related matters. It is of great importance to provide a free working environment in expanding the field of authority and self-determination of teachers since it allows them to reveal their potential, increasing their commitment to the organization (Ertürk, 2020). Teachers' self-determination plays an important role in exposing students' creative behaviors as well (Iwata, 2013). It will increase the student achievement as a result of making teachers more effective. In addition, since the autonomous behavior of teachers contributes positively to the education, teachers should be given the opportunity to use new methods and techniques, care about the needs of their students, make their own decisions and implement these in teaching. Teachers can be more willing and efficient in implementing the decision if they have a say in the decision-making process (Ertürk, 2020). That's why, it is very important that teachers have a high level of self-determination perceptions.

Teachers' perceptions of job satisfaction were found to be moderate. Essex (2000), Ersözlü (2012), Karakuzu (2013), Ayyıldız Erbek (2017), Bil (2018), Jahan and Ahmed (2018), Köse (2020), Ertürk (2021b) concluded that teachers' job satisfaction is moderate. while Karataş and Güleş (2010), Berry (2012), Bogler and Nir (2014), De Nobile (2016), Larkin, Brantley-Dias and Lokey-Vega (2016), Schreyer and Krause (2016), Idi (2017), Kerim (2021) have found that teachers' job satisfaction is high. The quality of education varies depending on the job satisfaction of the teachers. Teachers' job satisfaction can be considered a good instrument in improving the quality of education. The employees with high job satisfaction spend their time, energy and effort on their work, which results in high productivity. So, it is important whether teachers are satisfied with what they do (Scott, 2004; Gamsız, Yazıcı & Altun, 2013). In this sense, moderate satisfaction of teachers can also reduce the quality and effectiveness of educational activities. In addition, job satisfaction is one of the factors of turnover intentions (Ingersoll & Smith, 2003; Makela, 2014). As a matter of fact, employees with high job satisfaction stay in the organization longer (Shalley, Gilson, & Blum, 2000), their intention to leave the organization decreases or disappears (Aghaei, Keivan, & Shahrbanian, 2012), and positively affects organizational productivity and the physical and psychological conditions of employees (De Simone, Cicotto and Lampis, 2016). By increasing the job satisfaction of teachers to a high level, their performance, professional dedication and subjective well-being can be increased. For this, the teaching profession should be made an ideal profession and teachers should be able to perform their profession in better environments. Moreover, it is expected that negative situations such as burnout, desire to leave work, stress, alienation and withdrawal will decrease while their attitudes towards work will become more positive

and the quality of educational activities and the success of students and school will increase upon an increase in teachers' job satisfaction (Ertürk, 2021b). Therefore, it is concerning that the teachers' job satisfaction is moderate. For this reason, necessary measures should be taken starting off the schools in order to increase the job satisfaction.

Teachers' perceptions of organizational citizenship were found to be moderate. In addition to the studies in the literature concluding that teachers' perceptions of organizational citizenship are at a high level (Akdemir, 2018; Alarçin, 2020; Altınkurt & Yılmaz, 2012; Bayrak, 2017; Çelik & Konan, 2021; Çerezci, 2019; Ertürk, 2018; Güneş, 2019). It is also possible to come across studies (Çetin, 2011; Gökmen, 2011; Kurtulmuş, 2016; Uslu, 2011; Yılmaz, 2012), which concluded that teachers' organizational citizenship perceptions are at a moderate level, supporting the result of the research. The emergence of different results in the mentioned studies may be due to sample differences and the different places where the studies were conducted since the working conditions, managers and environmental factors of each sampling group differ. This situation may affect teachers' organizational citizenship behaviors.

The main factor that the organizations operating in today's harsh competitive world can maintain their presence is to have employees who can internalize the objectives and values of the organization by adopting them and contribute positively to change not only through their official work, but also through unofficial ones (Somech & Drach-Zahavy, 2004). Since the teachers' organizational citizenship behaviors are characterized as a positive behavior performed in an organization (Altınkurt, Anasız & Ekinci, 2016) and an important factor that contributes to the effectiveness of school and facilitates the administrative roles of school administrator (DiPaola & Tschannen-Moran, 2001), the moderate level of organizational citizenship behavior of teachers can lead to a decrease in teachers' acting extra-role behaviors in making the school efficient and effective. Organizational citizenship behavior is positively correlated to individual performance and organizational efficiency, contributes to the effectiveness of the organization, strengthens the social structure of the organization and reduces the conflicts and arguments in the organization (Sezgin, 2005). Organizational citizenship behavior is critical for creating a quality educational environment in schools (DiPaola & Hoy, 2005). With all this in mind, high levels of teachers' perceptions of organizational citizenship can improve the teachers' performances, improve the quality of educational activities carried out in schools, and make the school more successful. However, the moderate level of perceptions of organizational citizenship obtained in this study can be viewed as inadequate for teachers to exhibit the desired level of organizational citizenship behavior because there could be other things that the teachers do or various situations in which the teachers encounterother than their official duties. It may be possible for teachers to take part in extra-role situations voluntarily apart from their official duties by exhibiting a high level of organizational citizenship behavior.

In this study, it emerged that the total of psychological empowerment scale, the dimensions of meaning, competence, self-determination had a strong positive correlation with both job satisfaction and organizational citizenship, but the dimension of *impact* had a moderate positive relationship with job satisfaction and organizational citizenship. As the teachers' perceptions of empowerment increase, their job satisfaction also increases, and they exhibit more organizational citizenship behavior. In some studies in the literature, it has been found that there is a positive significant relationship between teachers' perceptions of psychological empowerment and job satisfaction (eg., Holdsworth & Cartwright, 2003; Buitendach & Hlalele, 2005; Zembylas & Papanastaiou, 2005; Wang & Lee, 2009; Somuncuoğlu, 2013; Lee & Nie, 2014; Khany & Tazik, 2016; Demiray, 2018; Kızıalay, 2018) while in other studies, a positive significant relationship has been found between teachers' perceptions of psychological empowerment and organizational citizenship (eg., Aksel, Serinkan, Kızıloğlu & Aksoy, 2013; Bogler & Somech 2004; Shapira- Lishchinsky & Tsemach, 2014). In this sense, the findings of this study are in line with the related literature.

The sub-dimensions of psychological empowerment and the total of psychological empowerment scale are significant predictors of job satisfaction. It shows that the teachers' perceptions of psychological empowerment have an effect on their job satisfaction. It could be concluded that when the teachers deem their work as meaningful and perceive that they are competent and self-determined to do their job and they have an impact in the school, their job satisfaction will also increase positively. The employees who believe that there is a meaning in what they do are satisfied with their work (Dickson & Lorenz, 2009; Boonyarit, Chomphupart & Arin, 2010). Karakuş (2019) has also found that there is a moderate positive relationship between psychological empowerment and teachers' job satisfaction based on the teachers' perceptions, and the sub-dimensions of psychological empowerment are significant predictors of the teachers' job satisfaction. There are also other studies in the literature concluding that psychological empowerment is a predictor of job satisfaction, which is also in line with this study (eg., Savery & Luks, 2001; Dewettinck, Singh & Buyens, 2003; Laschinger et al., 2004; Tolay, Sürgevil & Topoyan, 2012). Therefore, it has been revealed that the perceptions of psychological empowerment are important in increasing teachers' job satisfaction.

The sub-dimensions of psychological empowerment and the total of psychological empowerment scale are significant predictors of organizational citizenship. These results show that the teachers' perceptions of psychological empowerment have an effect on their perceptions of organizational citizenship. It could be stated that the teachers' organizational citizenship behaviors will increase as their perceptions of psychological empowerment increase. The implementation of a work in a way that provides continuous feedback and self-determination allows employees to develop a sense of control. In some studies (eg., Yücel & Demirel, 2012; Çavuşoğlu & Güler; 2017), it was concluded that

empowerment positively affects organizational citizenship behavior. The results obtained in this study show similarities with the mentioned studies. In addition, some studies in the literature have concluded that psychological empowerment increases job performance and positively affects creative behaviors and organizational commitment (Çekmecelioğlu & Eren, 2007; Çöl, 2008; Gürbüz, 2012; Erdem, Gökmen & Türen, 2016). As seen in the situation of feedback and self-determination, the task found meaningful by the employeeis one of the factors that will increase the sense of responsibility and the possibility of the intrinsic motivation of employees. The characteristics of a work increase the level of responsibility that the employee feels towards their work or institution, and this sense increases the likelihood of individuals demonstrating organizational citizenship behavior (Özcan, 2011). The employees are encouraged and allowed to take the initiative by means of the empowerment (Gilbert, Laschinger & Leiter, 2010). Empowered employees have control and authority over their work, adopt and internalize the missions of the organization, attach to their organizations emotionally and demonstrate organizational citizenship behavior (Menon, 2001). Psychologically empowered employees have acquisitions such as knowledge, rewards, the ability and self-determination to do work, the power to make an impact and participation in decisions. It will be more likely that in return for these acquisitions, the employee will show effort and performance; that is, organizational citizenship behaviors, beyond the defined requirements (Chiang & Hsieh, 2012). For this reason, the fact that the teachers find their work meaningful, have self- determination and impact over their work will enable them to be willing, responsible,

creative and internalize their work, thus, increasing organizational citizenship behavior .

CONCLUSION AND RECOMONDATIONS

It is concerning that the teachers' perceptions of psychological empowerment are at a *moderate* level in the dimension of self-determination because teachers' having a certain level of self-determination in work-related matters makes it easier for them to do their work depending on the condition of their classrooms. In other words, when teachers are self-determined, they will operate their classes depending on the status and level of the students and prepare additional activities diversifying the methods and techniques. Giving teachers a strict program to follow will hinder their creativity and make it harder for them to get out of the limits. However, teachers should have a certain self-control over their work and be able to act outside the program accordingly. This is a result that shows the authenticity of the study in terms of highlighting the teachers' self-determination.

Given that teaching is characterized as a profession that requires extra role apart from official duties, it is concerning and striking that the teachers' perceptions of satisfaction and organizational citizenship are moderate since they will have poor performance when their job satisfaction levels are not high. In this case, it would be a fallacy to expect the teachers with low job satisfaction to exhibit organizational citizenship behaviors since satisfied individuals view the work as meaningful, do it willingly and

make more effort than necessary to make it better quality. Considering that one of the findings of the study is that the teachers' job satisfaction is a predictor of organizational citizenship behaviors, it can be stated that job satisfaction is crucial for organizational citizenship behavior.

According to the findings, as the teachers' perceptions of psychological empowerment affect both job satisfaction and organizational citizenship behaviors, psychological empowerment is considered as necessary in increasing teachers' job satisfaction and organizational citizenship behaviors. In this sense, the fact that teachers have autonomy over their work, that their competency is increased, that they are ensured to be effective by allowing them to think about, talk, and intervene in events, and that their participation in work-related decisions are ensured will increase their job satisfaction and organizational citizenship behavior as well.

In summary, in order to increase teachers' job satisfaction and organizational citizenship behaviors, it would be good for policy makers and decision makers, especially school administrators, to consider teacher empowerment and to give importance to studies on teacher empowerment. Especially, teachers should be empowered in terms of autonomy. In the 21st century, teacher empowerment emerges as an important issue both in the literature and in practice. In addition, teachers who feel empowered will have higher self-confidence and will work more willingly and diligently. In this context, all education administrators, including school administrators, should provide a working environment where teachers can work autonomously and make independent decisions on issues that concern them.

Some recommendations have been developed in the context of research findings and results. Psychological empowerment perceptions can be increased in the dimension of self-determination by enabling teachers to participate in decision-making processes related to their work and act independently and freely in doing their jobs. Teachers' job satisfaction can be improved by increasing the teacher salaries, providing teachers with development opportunities required by the profession, and making the teaching profession an ideal, attractive and respectable profession in society. Considering the effect of psychological empowerment on job satisfaction and organizational citizenship, and the effect of job satisfaction on organizational citizenship, it would be useful to take actions that ensure psychological empowerment and job satisfaction of teachers in terms of school and higher institutions. A study can be designed on whether job satisfaction predicts organizational citizenship. A qualitative study could be conducted on teachers' perceptions of organizational citizenship and job satisfaction.

LIMITATIONS

This research is limited to the opinions of 314 teachers working in primary schools in Bolu city center in the 2020-2021 academic year on psychological empowerment, job

satisfaction and organizational citizenship scales. The findings and results of this research reflect the views of the teachers as participants of this study, and it would not be scientifically correct to make a sharp generalization.

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Predictive Relations Between Quest for Significance and Social Media Addiction of Adults

Ekrem Sedat ŞAHİN [1]

Abstract:

The aim of this study was to analyze quest for significance of adults according to their demographic features and to determine predictive relations between quest for significance and social media addiction of adults. The data of the study were collected from a total of 556 participants, 188 men and 368 women aged 18 and over. Participants were recruited by utilizing convenience sampling technique, and correlational survey method of quantitative research models was adopted within this study. Quest for Significance Scale, Social Media Addiction Scale and Personal Information Form were used as data collection tools. The data from assessment tools were analyzed using the T-test, and multi-group comparisons were made using ANOVA (one-way analysis of variance). The relation between the points acquired from assessment tools was calculated using Pearson's Moments Multiplication Correlation Coefficient. Predictive relations between quest for significance and social media addiction was analyzed using simple linear regression model. Significant difference was determined in quest for significance of adults as a result of the study considering age level, marital status, time spent on social media, the reason for using social media and whether using social media has any impact on sleeping pattern. On the other hand, no significant difference was determined in quest for significance of adults in terms of gender, income and educational background. A moderate positive correlation between quest for significance and social media addiction of adults was determined.

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INTRODUCTION

People have the basic need of feeling important, significant or esteemed in the eyes of others (Kruglanski et al., 2014). The sense of significance is identified by a person's perception of how others or members of his group value him (Kruglanski et al., 2022). Quest for significance or personal significance is the will of a person to be esteemed and deemed important in the eyes of other important people and self (Kruglanski & Bertelsen, 2020; Kruglanski et al., 2009; Kruglanski et al., 2014). Quest for personal significance is defined as a major source of motivation in human behaviours (Kruglanski & Bertelsen, 2020; Kruglanski et al., 2009; Kruglanski & Orehek, 2011). The concept of quest for significance refers to having a competence in the context that the culture in which one lives in is valuable, and what the culture considers "worth achieving". In addition, reaching the appreciation of others, which is important for the individual himself, is also a dimension of the search for importance (Kruglanski et al., 2013). Moreover, it is essential that how achievement, adequacy, reputation and influence is defined socially and culturally (Sedikides et al., 2003).

One's sense of significance provides him self-love (amour propre) in the eyes of members of his reference group as it was depicted by Rousseau (Kruglanski et al., 2013). Amour propre is a relative and artificial sense in the society. Amour-propre is an artificial process that occurs in society, which leads people to value themselves more than anyone else, inspires all the evil that people do to each other, and is also the main source of honor. (Smith, 2006). Rousseau remarks that amour propre emerges in games of children as soon as they begin to play games. A child never observes others unless looking into himself and without comparing himself with them (Chazan, 1993). A person evaluates himself within his environment, develops a sense on his significance and may continue to quest for significance. The notion of the significance quest is explained with Significance Quest Theory (SQT).

Significance Quest Theory (Kruglanski et al., 2009; Kruglanski et al., 2014; Kruglanski & Orehek, 2011) acknowledges that the desire to matter is a fundamental human need. According to the theory, people get strongly motivated to realize behaviors leading to regain the sense of significance when they suffered a loss of it (Schumpe et al., 2018). SQT states that there is a common core among predefined causes of individual significance quest. Herein personal loss, humiliation, vengeance, group pressure, loyalty to the group leader, self-esteem, appeal of the result, obtaining social status or preserving it, religious perks and monetary benefits even feminism may be the subject (Bloom, 2003; Webber et al., 2017). The quest for significance can occur in the ways of opportunity to behave heroically or existence of audience appreciating the heroism (Kruglanski et al., 2022). SQT mentions three interwoven conditions for the significance quest to be activated (Elliott et al., 2007; Kruglanski et al., 2014). They are a loss of significance, a threatened

significance loss and an opportunity for significance gain (Kruglanski & Bertelsen, 2020; Kruglanski et al., 2014; Webber et al., 2017).

Loss of significance: SQT states that an experienced significance loss drives an individual to search and find "proper ways to gain significance" (Kruglanski et al., 2014). One can suffer loss of significance due to personal failure and humiliation. This loss can be directly connected with intergroup conflicts in which one's group is involved and impacts his own group on his sense of significance. Alternatively, significance loss can happen due to personal failures and misfortune unrelated with conflict (Dugas and Kruglanski, 2014). A sense of humiliation or kind of dishonors happens due to loss of significance. Humiliation makes one's sense of personal significance to descend below the normal level. Then, the individual searches for behaviours to regain or restore downed sense of significance (Webber et al., 2017). What is more, loss of significance is related to insults and injustice perpetrated against a group (e.g., as a Muslim, an Arian, a Jew or a communist) with which an individual identifies strongly, and therefore constituting a key aspect of his social identity. Injustice allegedly perpetrated against one's group may cause an effective sense of significance loss. All these may cause one to feel insignificant and weak (Kruglanski and Bertelsen, 2020; Kruglanski et al., 2009; Kruglanski et al., 2018).

Threat of significance loss: When the basic desire to matter restrained, in other words, individuals encounter a loss of significance or even a threat to it, they become motivated to find ways of regaining their significance (Kruglanski et al., 2018). The threat to the significance can motivate actions intended to prevent it. What is related with the true significance loss is the possible loss that might happen in an event that one's refusal of a vital task (e.g., being a suicide bomber) for self, group or society. Individuals who are proud of their commitment to a group may face humiliation and accusations of hypocrisy in case of avoiding risking their lives to defend their case (Kruglanski et al., 2015). For instance, Japanese Kamikaze pilots of WW II did not want to die nor did they expect heavenly rewards (Ohnuki-Tierney, 2006; as cited in Kruglanski et al., 2014). However, they volunteered because if they refused the mission a grave dishonour would have bestowed upon them and their families and, apparently, it was much more unbearable than an honourable death (Webber et al., 2018).

Opportunity for significance gain: Significance loss or threat of loss can be interwoven with the actions aimed at eliminating or preventing the loss (Kruglanski et al., 2018). The first motivator in the significance quest of individuals does not have to be humiliation or efforts to end poverty and individuals seeking significance and they do not have to be ill-informed, exposed to harassment or discrimination. Instead, they can be in a good shape with expectations for a bright future. These individuals get motivated with the appeal of becoming a famous hero or "a truly bigger figure" (Webber et al., 2017). The goal here can not be simply avoiding sense of insignificance as it is in significance loss but going for becoming a super star, in other words, an importance so great that hardly satisfied by

daily living conditions (Webber et al., 2017). If an arisen opportunity is likely to help one to gain significance, then one can fight to achieve it.

When the significance quest transcends (as a result of either sense of significance loss or motivation to gain significance) other concerns become suppressed. It releases the behaviour formerly constrained by the latter concerns (empathy for others, kinship, love, etc.) and allows it to be enacted (Kruglanski and Ellenberg, 2020). Sense of insignificance is an unpleasant feeling requesting for action (Kruglanski et al., 2009). As it was also expressed by the above-mentioned views of Rousseau, the significance quest is a product of sociality and social environment. From the early days of childhood, an individual tends to quest for significance within his/her social environment. One of the social environments of our age is social media. One can use social media for the significance quest or incline to it in social media.

Today, rapid popularization of web-based social media (e.g., Facebook, WeChat and Instagram) and change of communication ways between people take place as a result of the developments in information technologies (Hou et al., 2019; Smith & Anderson, 2018). Adoption of social media is based on its increasing usage as a communication channel in personal as well as business life and other aspects of life (Stieglitz et al., 2014). Since its appearance, social media has been a communication and information sharing platform and brought about a social change. It enabled people to express their ideas and views, and to share them (Taprial and Kanwar, 2012).

In the "Global Overview Report" published with the partnership of We Are Social and Hootsuite, as of January 2022, internet and social media users are respectively reported as 4,95 billion and 4,62 billion. Sixty-two point five per cent of the world population are social media users. In the world, an average of 2 hours and 27 minutes is spent a day on social media. Use of social media in Turkey is more than world average according to Report on Internet and Social Media Habits of Turkey (2021). Population of Turkey, as of January 2022, is 84.69 million. Seventy-seven point seven per cent of the population, 65.8 million in other words, are internet users while 70.8% of the population are social media users. In other words, there are 60 million social media users in Turkey. Compared to the last year, 6 million more people started to use it. Seven hours and 57 minutes is spent on the internet while 2 hours 57 minutes is spent on social media in our country.

Social media is dynamic, ever-changing and growing. It grows rapidly in terms of diversity, accessibility, effectiveness and use (Taprial and Kanwar, 2012). Although offer many possibilities to increase people's life quality, it is also a double-edged phenomenon with the possibility of bringing some problems such as social media addiction (Leong et al., 2019). Recently, excessive usage of social media have been identified as a behavioural addiction as a result of sharing same symptoms such as withdrawal, conflict, relapse,

tolerance and mood modification with other types of addictions (Priyadarshini et al., 2020).

Social media addiction is a term used for individuals spending excessive time on Facebook, Twitter, Instagram or other social media platforms. It affects other aspects of daily life (Grau et al., 2019). Excessive preoccupation with it, preferring online communication rather than face-to-face and using it to increase motivation and decrease stress are some examples of cognitive symptoms of an addiction also seen in the social media addiction (Caplan and High, 2006). Social media addiction as "excessive and habitual use of social media showing itself using it compulsively instead of other activities". Social media may purport compulsive behaviours and even behavioural addiction at a level which may prevent daily functions and productivity (Zivnuska et al., 2019). In his research on causes of social media addiction among college students, Aksoy (2018) determined that participants are tend to use social media because of being unable to make friends, lack of socialization, monotony, keeping up with the developments, sense of performing their duty, maintaining social relations. In the research conducted by Unlü (2018) on individuals over the middle age, communicating with loved ones such as relatives, friends, children and grandchildren were reported as the reasons for using social media. On the other hand, social media is being used for interacting and communicating with friends and family, filling free time, reading new stories, finding a content and staying up to date according to Digital 2022 Global Overview Report (2022).

Research on quest for significance is carried out on topics such as suicide bombers (Kruglanski et al., 2009), terrorism (Kruglanski et al., 2013; Webber et al., 2017), and violence (Jasko et al., 2017; Kruglanski and Bertelsen, 2020). In these studies, it is seen that the factors that lead people to these behaviors are the loss of significance or the threat of loss of significance. On the other hand, it is known that the opportunity to gain significance leads the individual to quest for significance. Searching importance, which can rarely be met by daily life conditions (Webber et al., 2017), leads the individual to quest for significance. In other words, one's desire of retrieving his place in society triggers the quest for significance (Milla et al., 2019). Social media is the communication medium of the current era. As people try to meet many of their needs in this environment, they can also quest for significance in the social media environment. In this context, it can be thought that there is a relationship between quest for significance and social media addiction. When the literature is examined, no research has been found that examines the relationship between quest for significance and social media addiction. On the other hand, there is no research in the literature that reveals the quest for significance according to the demographic characteristics of adult individuals. In this study, it is aimed to determine whether there is a relationship between quest for significance and social media addiction, and if there is a relationship, the direction and strength of the relationship. Consequently, this study sets out answer following questions:

1. How does the quest for significance of adults differ in terms of their demographic characteristics such as gender, age level, level of income, educational background, marital status?
2. How does the quest for significance of adults differ in terms of variables such as time spent in social media, reason for using social media and sleeping pattern)?
3. Does the quest for significance predict social media addiction?

METHOD

Research Model

This study was designed as a survey study. The survey method provides quantitative and numeric descriptions of trends, attitudes and opinions of a sample from a universe (Creswell, 2014). The significance quest of adults in terms of their different demographic characteristics and the relation between the significance quest and social media addiction of adults were analyzed using relational survey design.

Participants

Significance Quest Scale (SQS), Social Media Addiction Scale Adult Form (SMAS – AF) and Personal Information Form (PIF) were applied to 556 social media users composed of 368 women and 188 men, who are 18 and older, within the study. Convenience sampling method was used to reach participants. According to Şenol (2012), convenient sampling includes selecting participants among convenient units suitable to attend applications in cases of limitations of time, money and labour force. In terms of participants' socio-economic status, the majority of them live on minimum wage or less. Most of them are higher education graduates and single who reported that they use social media averagely 8-14 hours a week. In addition to these, most of the participants expressed they use social media to spend time and their sleeping patterns remain are unaffected by that.

Data Collection Tools

Significance Quest Scale (SQS), Social Media Addiction Scale Adult Form (SMAS – AF) and Personal Information Form (PIF) were applied to adults by the researcher. In order to ensure candidness in participants' answers to data collection tools, the required motivation was tried to be provided through explaining the subject and importance of the study. In order to ensure that the participants answered the measurement tools honestly and sincerely, there was no obligation to write their names.

Significance Quest Scale (SQS): The scale, which was developed by Şahin and Derin (2020) to determine the levels of the significance quest of adults, was applied to 406 adults who were included in the study by the method of convenience sampling.

Exploratory Factor Analysis (EFA) of the measurement tool was conducted by inserting the results of the application. The form, with 4 factors and 26 items, acquired via AFA was applied to 215 adults to collect data for Confirmatory Factor Analysis (CFA). Goodnes-of-fit (GoF) values, acquired with the data collected from this application, were found as χ^2/sd= 1.89, CFI= .92, TLI= .91, IFI= .92, GFI= .86, RMSEA= .065. As a result of CFA, the scale was found to have 26 items and 4 factors, and an acceptable goodness-of-fit value. Sub scales of the measurement tool were named as "Impressiveness, Adorability, Uniqueness, and Quest for Popularity. The convergent validity of the scale was .67; face validity was calculated as .90. The reliability of SQS has been examined for stability and internal consistency. The Cronbach Alpha coefficient calculated within the scope of internal consistency was .95; The test-retest correlation coefficient calculated to determine the stability was found to be .84. This value indicates that the scale is quite reliable. Internal consistency of the scale was analysed using the data of this study. Calculated Cronbach's Alpha coefficient within this scope is .96.

Social Media Addiction Scale Adult Form (SMAS – AF): Measurement tool is a scale for determining the social media addiction of adults aged 18-60. During the development phase of Social Media Addiction Scale Adult Form (SMAS – AF) a sampling consisting of 1047 adults was included. Studies of exploratory and confirmatory factor analyses were conducted with the data acquired from the sampling. Factor loadings of the scale were observed to vary between .61 and .87. Chi-square value (χ^2=7051.32; sd=190, p=0.00) was determined to be significant with the confirmatory factor analysis conducted to confirm two-factor structure of the scale. On the other hand, goodness-of-fit index values were found to be GFI=.90; AGFI=.88; NFI=.59; CFI=.96; RMSA=.059; SRMR=.060. Cronbach's Alpha coefficient was calculated to identify general internal consistency of the scale. This value was calculated as .94 for the whole scale. Test-retest reliability coefficients of scale is .93 (Şahin and Yağcı, 2017). Internal consistency of the scale was analysed with the data acquired from this research. Cronbach's Alpha coefficient calculated within this scope is .89.

Personal Information Form (PIF): The form prepared by the researcher consists of 8 questions. They are aimed at determining following information of the participants: gender, marital status, whether using social media has any impact on their sleeping pattern, age level, level of income, educational background, time spent on social media and the reason for using social media.

Data Analysis

Data acquired from data collection tools were analysed through inserting them to SPSS 25.0 software. Skewness and kurtosis coefficients of the data acquired from SQS and SMAS – AF were calculated to identify if survey data meet assumption of normality. If skewness and kurtosis values are ranged between -1,5 and +1,5 the distribution of data is accepted normal (Tabachnick and Fidell, 2013). Since the skewness and kurtosis values of

the data obtained from the SQS and SMAS-AF application vary between -1.5 and +1.5, it can be said that the scale scores are in the normal distribution range. Thus, parametric tests were used within analyses conducted.

T-test was used in the analysis of data to determine if the difference between two-dimensional independent sample means is significant. On the other hand, one-way analysis of variance (ANOVA) was applied to determine if the difference between sample means of more than two groups is significant. Additionally, the relation between quest for significance and social media addiction, which are respectively the independent and dependent variables of the research, was analysed with the simple linear regression method. The relation between scores acquired by scales were calculated using Pearson Product-Moment Correlation coefficient. Effect size statistics were calculated in order to determine to what extent the independent variable is effective on the dependent variable (Buyukozturk, 2018). Within this scope, Cohen's d for the compared groups was calculated. Cohen's d is considered small, medium and large effects when it is respectively .20, .50, .80. (Cohen 1998). Eta-square (η^2) correlation coefficient was used to calculate effect size within groups compared using ANOVA. Eta-square (η^2) is interpreted as small, medium and large effect sizes if it is respectively at the levels of .01, .06, .14 (Buyukozturk, 2018). The margin of error of the research is .05.

Ethical considerations

In this study, all rules within the scope of "Higher Education Institutions Scientific Research and Publication Ethics Directive" were followed. None of the actions stated under the title "Actions Against Scientific Research and Publication Ethics", which is the second part of the directive, were taken.

Ethical review board name: (Aksaray University, Human Research Ethics Committee)

Date of ethics review decision: (26.08.2021)

Ethics assessment document issue number: (2021/06-06)

RESULTS

Firstly, findings related to the significance quest of adults according to their demographic characteristics and then results revealing predictive relations between the significance quest and social media addiction are presented within this section of the study. The significance quest of adults was analyzed in terms of gender, age level, level of income, educational background, marital status, time spent on social media, the reason for using social media and whether using social media has any impact on sleeping pattern of them. Findings of the significance quest of adults according to gender, marital status and

whether sleeping patterns of them is affected by using social media are depicted in Table 1.

Table 1.

The Significance Quest of Adults According to Gender, Marital Status and Whether Sleeping Patterns of Them is Affected by Using Social Media

Variable		n	$\overline{X}$	S	sd	t	p	Cohen d
Gender	Woman	368	57.79	22.19				
					554	1.83	.07	
	Man	188	61.53	23.94				
Marital Status	Single	359	63.09	23.26				
					554	5.79	.00	.52
	Married	197	51.69	20.13				
Does it affect sleep patterns?	Yes	167	65.47	24.79				
					554	4.14	.00	.39
	No	389	56.30	21.40				

As it is seen in Table 1, there are no significant difference between the significance quest of adults according to gender (t=1.83; p>.05). Thus, it can be said that there is no statistically significant difference between quest for significance of women and men.

In addition, there is a statistically significant difference between the significance quest of adults according to marital status (t=5.79; p<.01). Thus, it can be stated that mean of the significance quest scores ($\overline{X}$=63.09) of single participants (n=359) is statistically higher than that ($\overline{X}$=51.69) of married participants (n= 197). Cohen's d, calculated to identify the effect of marital status variable on the significance quest of participants, was found to be .52. This value indicates that the variable of marital status affects the significance quest of participants at a medium level. Accordingly, the significance quest of single adults is higher than that of married adults.

As can be seen from Table 1, there is a statistically significant difference between the significance quest of adults according to whether sleeping patterns of them is affected by using social media (t=4.14; p<.01). Accordingly, mean of scores ($\overline{X}$=65.47) of significant quest of adults whose sleeping pattern is affected by using social media (n=167, $\overline{X}$=56.30) is seen to be higher than that of those whose sleeping pattern is not affected by using social media (n=389). Cohen's d, calculated to identify the effect of the variable of whether sleeping pattern is affected by using social media on the significance quest of participants, was found to be .39. This value indicates that the variable of whether sleeping pattern is affected by using social media affects the significance quest of participants at medium level. Accordingly, the significance quest of adults whose sleeping pattern is affected by

using social media is higher than that of adults whose sleeping pattern is not affected. Descriptive statistics and ANOVA results regarding the mean scores of the quest for significance according to the age levels of adults are presented in Table 2.

Table 2.

Descriptive Statistics and ANOVA Results Related to The Significance Quest of Adults According to Age Levels

Age Levels	n	$\overline{X}$	S	Source of Variance	Sum of Squares	sd	Mean Squares	F	p	η^2	Significant Difference
25 & younger (A)	301	61.48	22.30	Intergroup	9747.41	4	2436.85	4.79	.001	.03	D- A
26- 35 (B)	108	60.89	24.90	Within groups	279944.74	551	508.06				D- B
36- 45 (C)	64	56.00	22.93	Total	289692.15	555					
46- 55 (D)	42	47.73	20.49								
56 & older (E)	41	52.75	18.69								

As stated in Table 2, a statistically significant difference between means of the significance quest scores of adults according to age levels was found (F=4.79; p<.01). Scheffe's Multiple Comparison Test was performed to determine between which groups significant difference exists. Differences between mean scores of adults aged 46-55, and those who are 25 or younger, and those aged 26-35 were found. When mean scores of these groups are examined, mean of the significance quest scores ($\overline{X}$=47.73) of adults aged 46-55 (n=42) are seen to be smaller than ($\overline{X}$=61.48) of adults aged 25 or younger (n=301) and ($\overline{X}$=60.89) of adults aged 26-35 (n=108). Eta-square (η^2) correlation coefficient calculated to determine the effect of age level variable on the significance quest of participants was found to be .03. This value of eta-square (η^2) yields that the age level variable affects the significance quest of participants at a low level. Accordingly, this can be said that the significance quest of adults aged 46-55 are lower than that of adults aged 25 or younger and aged 26-35. Descriptive statistics and ANOVA results regarding the mean scores of the quest for significance according to the level of income of adults are presented in Table 3.

Table 3.

Descriptive Statistics and ANOVA Results Related to The Significance Quest of Adults According to Level of Income

Level of Income	n	$\overline{X}$	S	Source of Variance	Sum of Squares	sd	Mean Squares	F	p	η^2	Significant Difference
2850 TL and less	266	60.01	21.76	Intergroup	921.78	3	307.26	.58	.62		
2851- 5700 TL	140	57.75	24.56	Within groups	288770.37	552	523.13				
5701- 8550 TL	100	57.41	21.92	Total	289692.15	555					
8551 TL and more	50	60.90	25.46								

As it is seen in Table 3, no statistically significant difference between means of the significance quest scores of adults according to level of income was found (F=.58; p>.05).

Thus, this study found no statistically significant difference between quest for significance of adults according to level of income. Descriptive statistics and ANOVA results regarding the mean scores of the quest for significance according to educational background of adults are presented in Table 4.

Table 4.

Descriptive Statistics and ANOVA Results Related to The Significance Quest of Adults According to Educational Background

Educational Background	n	$\bar{X}$	S	Source of Variance	Sum of Squares	sd	Mean Squares	F	p	η^2	Significant Difference
Primary Education	38	56.39	24.06	Intergroup	419.24	2	209.62	.40	.67		
High School	50	57.72	21.03	Within groups	289272.90	553	523.09				
Higher Education	468	59.41	22.95	Total	289692.15	555					

As Table 4 suggests, no statistically significant difference between means of significance quest scores of adults according to educational background was found (F=.40; p>.05). Thus, it can be said that there is no statistically significant difference between quest for significance of adults according to educational background.Descriptive statistics and ANOVA results regarding the mean scores of the quest for significance according to the time spent on social media of adults are presented in Table 5.

Table 5.

Descriptive Statistics and ANOVA Results Related to the Significance Quest of Adults According to the Time Spent on Social Media

Average per week	n	$\bar{X}$	S	Source of Variance	Sum of Squares	sd	Mean Squares	F	p	η^2	Significant Difference
1 hours or less (A)	38	46.60	16.97	Intergroup	17784.85	4	4446.21	9.01	.00	06	E- A
2-7 (B)	166	55.96	21.72	Within groups	271907.30	551	493.48				E- B
8- 14 (C)	172	57.98	21.31	Total	289692.15	555					E- C
15- 20 (D)	97	62.13	23.08								
21 hours or more (E)	83	69.57	25.78								

As it is seen in Table 5, there is a statistically significant difference between the significance quest of adults according to the time spent on social media on a weekly basis (F=9.01; p<.01). Scheffe's Multiple Comparison Test was performed to determine between which groups significant difference exists. As a result of this test, differences between mean scores of adults spending 21 hours and more a week on social media, those spending 8-14 hours, 2-7 hours and 1 hour or less a week were determined. When mean scores of these groups are examined, means of the significance quest scores of adults spending 1

hour or less a week (n=38, $\overline{X}$=46.60), adults spending 2-7 hours a week (n=166, $\overline{X}$=55.96), adults spending 8-14 hours a week (n=172, $\overline{X}$=57.98) on social media are seen to be smaller than the mean of the significance quest score ($\overline{X}$=69.57) of adults spending 21 hours or more a week on social media. Eta-square (η^2) correlation coefficient calculated to determine the effect of the variable of the time spent of social media on the significance quest of participants was found to be .06. This value of eta-square (η^2) indicates that the variable of the time spent on social media affects the significance quest of participants at a medium level. Accordingly, it can be stated that the significance quest of adults spending 21 hours or more a week on social media are higher than that of adults spending 14 hours or more a week on social media. Descriptive statistics and ANOVA results regarding the mean scores of the quest for significance according to the reason for using social media of adults are presented in Table 6.

Table 6.

Descriptive Statistics and ANOVA Results Related to the Significance Quest of Adults According to the Reason for Using Social Media

The Reason for Using Social Media	n	$\overline{X}$	S	Source of Variance	Sum of Squares	sd	Mean Squares	F	p	η^2	Significant Difference
Communication with friends (A)	130	57.34	20.26	Intergroup	13921.58	2	6960.79	13.95	.00	05	C-A
											C-B
Follow the news (B)	162	52.41	19.69	Within groups	275770.57	553	498.68				
Pass the time (C)	264	63.97	24.69	Total	289692.15	555					

As it is seen in Table 6, there is a statistically significant difference between the significance quest of adults according to the reason for using social media (F=13.95; p<.01). Scheffe's Multiple Comparison Test was performed to determine between which groups significant difference exists. According to this, there are differences between means of scores of adults using social media for spending time, communicating with friends and following news. When means of scores of these groups are examined, mean of the significance quest scores ($\overline{X}$=63.97) of adults using social media for spending time is seen to be higher than mean of the significance quest scores ($\overline{X}$=57.34) of adults using it for communicating with friends (n=130) and mean of the significance quest scores ($\overline{X}$=52.41) of adults using it for following news (n=162). Eta-square (η^2) correlation coefficient calculated to determine the effect of the variable of the reason for using social media on the significance quest of participants was found to be .05. This value of eta-square (η^2) indicates that the variable of the time spent on social media affects the significance quest of participants at a medium level. Accordingly, it can be said that the significance quest of adults using social media for spending time is higher than that of adults using it for communicating with friends and following news. Findings on whether a relation exists between quest for significance of adults and social media addiction are depicted below. Correlation between quest for significance and social media addiction and results of

simple linear regression analysis related to prediction of social media addiction by the significance quest is depicted in Table 7.

Table 7.

Correlation Results of the Relation between Quest for Significance of Adults and Social Media Addiction and Results of Simple Linear Regression Analysis Related to Prediction of Social Media Addiction by the Significance Quest

Correlation Results			Results of Simple Linear Regression Analysis						
	Quest for Significance	Social Media Addiction	Predictor	Predicted	B	SE	β	t	p
Quest for Significance	-	.477*		Constant	32.069	1.422		22.559	.000
Social Media Addiction	.477*	-	Quest for Significance	Social Media Addiction	.288	.022	.477	12.764	.000
R= .477	R²= .227		F= 162.916		p< .01				

A significant and a moderate positive correlation was determined to exist between (r= .477; p<.01) adults' means of scores from Significance Quest Scale (SQS) and those they get from Social Media Addiction Scale Adult Form (SMAS- AF). In addition, the significance quest of adults is seen to be a significant predictor of social media addiction (R= .477, R²=.227, p<.01) when Table 7 examined. Twenty-three per cent of the total variance related to social media addiction can be said to be explained with the significance quest.

DISCUSSION

In this section of the study, findings are discussed and interpreted within the existing literature and some suggestions are made according to findings. No statistically significant difference was determined between significance quest of adults according to gender. As a result, it can be said that there is no difference between women and men in terms of significance quest. Even if no study on comparison of women and men in terms of significance quest is encountered in the literature, it was determined in the study carried out by Webber et al. (2017) with regard to suicide bombers that primary motivation sources of female and male suicide bombers are respectively "the opportunity of eradicating the significance loss" and "possibility of gaining significance". In a similar previous study, the role of sensation seeking in political violence was examined. The sensation seeking was considered as an extension of the significance quest in it. In this study that was conducted with 7 separate samples, a relation between gender and the sensation seeking was determined for some of the samples (Schumpe et al., 2018).

The significance quest is assumed to have played a key role; therefore, it has been preserved during the human evolution (Kruglanski et al., 2022). According to this assumption, the significance quest, regardless of gender, distinguishes individuals who carry it. In accordance, it can be argued that the absence of statistically significant differences between the significance quest of women and men is in compliance with the theoretical basis. As stated above, the significance quest called as amour propre by Rousseau is a human-specific passion and humankind can not be distinguished from animals without it. The quest for significance is what makes us human. The thing making humans special is that their behaviors are socially grounded. Humans are social beings like many creatures but the former is cognitive. In other words, animals behaving socially do not think, yet humans do. Goals and purposes of an individual have socially determined meanings. These meanings are related to the cultural values and norms upheld by the society. These general values dynamically arise over a social process in order to consist a certain motivation (Kruglanski et al., 2013). The premise in the significance quest is not gender but being human. Regardless of gender, a human can go for significance quest within social life.

In the study, the quest for significance of adults was also analyzed with regard to marital status. Single participants have been determined to be tended more to the quest of significance than married ones. This result may be related with some aforementioned reasons. Being in the period of emerging adulthood and the next period of most of the single individuals can be explained with the significance quest scores of those groups which were found to be high. Individuals in this period are likely to be in the search of appropriate love and work identities and a worldview. Therefore, it can be said that single individuals make more effort than married individuals in the quest for significance. On the other hand, being able to get married or getting married is a step to feel significant. The institution of marriage is important in many cultures. For instance, more than 90% of the people living in The United States of America prefer to get married at some point of their life (Brubaker & Kimberly, 1993; Myers et al., 2005). Consequently, marriage is an important institution and considered as a precious life goal for an individual in our culture as well. Within this scope, married ones' having lower significance quest scores than single ones can be originating from their fulfilment of a sacred goal as marriage. However, single ones have not yet reached that level and fulfilled the expectations of the society and themselves. They can be feeling the deficiency of significance and in the quest for significance.

In the study, adults whose sleeping patterns are affected by using social media are determined to have higher significance quest than those whose are not. This finding means those using social media for a longer time and, for this reason, having negatively affected sleeping patterns tend more to quest for significance. The individuals using social media extensively can be in the quest for significance in this environment of socialization. When the significant quest activated exceeding other concerns, fulfilment of it becomes a priority

(Kruglanski et al., 2014; Kruglanski et al., 2022). Then it is turned into a certain goal which is driving the behavior aimed at gaining significance (Kruglanski et al., 2022). When an individual gets in a search for significance quest in social media or feels significant in social media, it can make keep him online for a longer time, and thus his sleeping pattern may get disturbed. He or she can prefer spending time in social media, which will increase his or her sense of significance, rather than sleeping in the end despite suffering from a disturbed sleeping pattern. Satisfying the activated significance quest through social media, he or she can even leave a physiological need as sleep aside. As a result, it can be claimed that there is a positive correlation between the time spent in social media and the significance quest. Similarly, a positive correlation determined between the significance quest and social media addiction as well.

The significance quest of adults aged 46-55 are found to be lower than that of adults aged 25 or younger and aged 26-35 within the study. This result can also be expressed in that the significance quest of individuals in the emerging adulthood and the young adulthood is higher than that of those in the adulthood. In the study carried out by Webber et al. (2017), a relation between age and the significance quest was determined but it is irrelevant to the quest of significance level according to age. In the aforementioned study, younger suicide bombers were determined to be motivated more with the possibility of gaining significance while older suicide bombers were determined to be motivated more with the opportunity of eradication of significance loss.

Participants of this study are adults who are 18 or older. In other words, those in the group expressed by "25 or younger" are aged 18-25. Arnett (2000) expressed that the individuals in this range of age are in young adulthood period. An individual in this stage is in the struggle for identity formation, having a worldview, trying and making decisions in business and love life. These efforts which are emerged during adolescence become more evident during emerging adulthood. Pursuits and tries of sense of identity and preferences varying in work and love of individuals in these ages make this period an inconstant, special, intense and privileged part of the life. In the study, the higher significance quest of participants who are 25 or younger compared to those aged 46-55 can be associated with explorations of the emerging adulthood period. In a way, one of the qualities pursued during this period can be personal significance or contributing factors to it (e.g., having a decent job). Tendency to behaviors as drug and alcohol use and risky sexual activities is relatively high during the emerging adulthood period (Arnet, 2000; 2005). Therefore, it can be inferred that these risky behaviors are due to the sensation seeking. Schumpe et al. (2018) consider the sensation seeking as an extension of the significance quest. Individuals in the period of emerging adulthood try to realize their personal significance through the sensation seeking. This is a period of possibilities in which an individual focuses on self and has the highest tendency for personal freedom and exploration. Individuals in this period are happier and more hopeful compared to

other periods (Arnett, 2000; 2004). They can be in the pursuit of the significance they desire by the influence of this optimism and hope.

Individuals aged 26-35 are seen to have higher quest for significance than those aged 46-55 in the results with regard to the significance quest according to age level. Individuals can also be in the pursuit of partner selection, finding a job or proving himself worthy or promotion if employed during the period of 26-35 following the emerging adulthood period. Therefore, the significance quest which is particularly high during the emerging adulthood period can be said to continue. According to TSI (Turkish Statistical Institute), the average ages for first-marriage of men and women are respectively 27,9 and 25,1 in Turkey as of 2020. Thus, individuals aged 26-35 are in pursuit of life activities as partner selection, finding a job to prepare for marriage. Finding a job and getting married can be stages of an individual to feel significant. The significance quest of the participants aged 26-35 can be high due to this reason.

No statistically significant difference between the significance quest of adults according to level of income was found in the study. The study conducted by Jasko et al. (2017) revealed that the people suffering a significant economic loss are more likely to engage in violent extremism. Quest for significance is activated by the loss of significance. Such loss can arise due to instances of individual humiliation. It can originate from a rejection by a desired other, a failure in school or work, victimhood caused by a war or a natural disaster and an economic loss (Kruglanski and Bertelsen, 2020). According to Significance Quest Theory (SQT), individual significance loss induces the goal of significance restoration (Kruglanski et al., 2014). Absence of a significant difference between the significance quest of adults according to level of income can originate from having not experienced an economic loss or, even if otherwise, not prioritizing it.

It was determined in the study that there is no statistically significant difference in the significance quest of adults according to educational background. According to Kruglanski et al. (2022), the need for significance refers to the motivation of being socially valuable. It means the desire of an individual to be respected by others. The sense of significance is determined by one's perception of how he is evaluated by others or members of his group. The self-esteem of an individual is typically in parallel with his perception of how he is evaluated by others. Thus, feeling themselves valuable and significant in consideration of their group may be underlying the absence of the difference in the significance quest of participants of the study with regard to educational background. No matter their educational background, individuals who have never suffered a sense or threat of significance loss or encountered with an opportunity for significance gain may not engage in a significance quest.

Some of the findings of the study is about analyzing the relation between the significance quest and variables related to social media use. Adults spending 21 hours or more on social media a week were found to tend more to quest for significance than those

spending 14 hours or less. In Digital 2022 Global Overview Report (2022), individuals aged 25-34 are stated to be using social media the most according to the age distribution. They are followed by those aged 18-24. A negative correlation between age and social media use is stated to exist again in the report and it is also mentioned that usage rate decreases as age individuals grow older. As 75% of the participants of this study are in those age groups and high tendency of these groups to quest significance is stated in the previous sections, individuals of this group might find a medium to realize their significance quest in social media. Therefore, high tendency to quest significance of those spending 21 hour or more on social media a week can be originating from realizing quest of significance in social media.

Participants using social media to spend time are found to tend more to quest for significance than those using it to communicate with friends and following the news in the study. According to the responses of social media users on their reason to use social media in Digital 2022 Global Overview Report 2022, 36,5% of them use it to follow recent developments and news, 34,4% of them use it to spend time and 33% of them use it to stay in touch with friends and follow their activities. According to Kruglanski et al. (2022), individual differences in the quest for significance are probably shaped by the way of parenting and socialization practices. Social media becomes more prominent day by day as an environment to socialize today. People try to socialize and tend to quest for significance within this environment. Those using social media to follow the news and communicate with friends can be said to have a clear goal. On the other hand, those using social media to spend time, in a way, quest significance in this environment. This may be the cause of the higher significance quest of those in this group.

In the study, a statistically significant positive correlation at a medium level between means of Significance Quest Scale and Social Media Addiction Scale scores of participants were found. The quest for significance was determined to be a significant predictor of social media addiction of adults. Almost 23% of the total variance related to social media addiction turned out to be explained with the significance quest. People can form a community, share information and content, and get answers to what they share in social media. Thanks to these, social media makes sharing views with ease, making friends with similar views and lifestyle come together to oppose the disagreed ideas. Individuals, who are not able to display those behaviors in real life that easy, can readily do so in social media. The conclusion would be that these individuals try to fulfil their significance quest by displaying those behaviors.

Nobody constantly seeks significance. Even the most ambitious individuals occasionally engage in other needs of leisure, entertainment and relationship irrelevant to significance. The significance quest must be activated firstly to activate a significance. The significance quest, as for other motivations, can be activated through one of two common ways and those are deprivation and incentive. When causes of social media addiction examined the effort of an individual to avoid his true self, in other words, to attain his

ideal self and to form "a new self" by introducing that "virtual self" to others as he wants is seen. An individual, suffering from a lack of confidence, feeling alone and who is non-political, finds the opportunity of creating an identity which is exact opposite of his true self through "virtual self" he formed in social media. An individual growing away from his "true self" with that virtual identity he formed in social media, can experience the sense of satisfaction at a high level (Akmeşe and Deniz, 2017). Accordingly, for an individual to eliminate the sense of significance loss for his real self through the opportunity given by social media for the "virtual self," he wants to become and feels significant by removing loneliness and apoliticality through it.

In the study conducted by Caplan (2003), lonely and depressed people with low self-esteem were determined to have a negative perception on their social incompetence and to prefer interactions on social media to face-to-face interaction. Aksoy (2018) determined in his research that social media is being used because of such reasons as being unable to make friends, lack of socialization and monotony. Kruglanski et al. (2022) relate the motivation of being socially valuable with the need for significance. An individual can feel his value increased with the communication, interaction, friendships and the groups that he is a member of. This sense of significance gain can cause social media to be indispensable for an individual, who is socially incompetent, having difficulty in making friends or unable to make any friends; therefore, cause him to become a social media addict through spending more and more time in this environment making him feel more significant day by day.

LIMITATIONS AND RECOMONDATIONS

The limitation of the study is that adults aged 18 years and over were included in the study where the relationship between adults' quest for significance and social media addiction was examined. The relationship between behavioral addictions such as social media addiction and smartphone addiction and quest for significance can also be addressed in adolescent groups. Another limitation is the sample size of the study. The sample size of 556 people is sufficient and acceptable. On the other hand, increasing the sample size in future studies will further increase the generalizability of the findings. In addition, this study was carried out with the quantitative research method. Qualitative studies may also be planned in the future to gain more in-depth information on the subject.

According to results of the study, the significance quest of the individuals in the period emerging adulthood and the next is high. Individuals in that period can display risky behaviors, tendency to drug and alcohol use and involvement in unhealthy friend groups in order to fulfil the existing significance quest of them. These behaviors can negatively affect one's life. For this reason, trainings can be provided for the individuals at the start of the periods of emerging adulthood and adulthood to make them able to

maintain their significance quest better and this quest of them can be directed to more positive and fruitful processes. Trainings on social skills and assertiveness can be provided for the social media users with difficulties in making social contacts, expressing themselves in real life to prevent them from being addicted to social media for fulfilling their significance quest. Today, most of the people are social media users. Directing the individuals in the significance quest via volunteering programs, sportive activities in which they can feel significant may be helpful in order to prevent their social media usage from turning into an addiction. These people can fulfil their quest for significance and also stay away from social media by making real contacts and communicating with them, performing useful activities.

CONCLUSION

Social media addiction is one of the important problems of our age. There are different variables among the causes of this addiction. In the present study, a moderate, positive relationship was found between quest for significance and social media addiction. Quest for significance can direct the individual to spend time in the social media environment and find the importance they need here. Quest for significance can trigger social media use and even addiction as the underlying motivation for many behaviors. Significant difference was determined in quest for significance of adults as a result of the study considering age level, marital status, time spent on social media, the reason for using social media and whether using social media has any impact on sleeping pattern. On the other hand, no significant difference was determined in quest for significance of adults in terms of gender, income and educational background. A moderate positive correlation between quest for significance and social media addiction of adults was determined.

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Research

The Relationship Between Faculty Members' Organizational Support Perceptions and Personal Growth Initiative Levels, The Mediating Role of General Self-Efficacy

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Article Type
Original Research

Abstract:

The aims of this study were to investigate the relationship between organizational support perceptions and personal growth initiative levels of the faculty members working in Turkey and to examine the effect of self-efficacy perceptions in this relationship. The study was designed as a relational survey model. 346 faculty members from public universities in Turkey comprised the participants. The data was collected with General Self-Efficacy Scale (GSES), Perceived Organizational Support Scale (POSS), Personal Growth Initiative Scale-II (PGIS-II). Descriptive analyses and structural equation modeling (SEM) was applied to examine the structural relations among the variables. It was observed that faculty members' organizational support perceptions had a significant direct effect on their personal growth initiative levels; organizational support perceptions had a significant effect on general self-efficacy beliefs; and the effect of general self-efficacy beliefs on personal growth initiative levels was significant. It was evidenced that faculty members' self-efficacy beliefs fully mediated the relationship between perceived organizational support and personal growth initiative levels. These results are in line with the principles of Organizational Support Theory and Social Cognitive Theory. More research explaining the effect of organizational factors on self-efficacy and personal growth initiative is needed.

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INTRODUCTION

In work life, in the realm of career development, individual career development initiations have gained significance and have been replacing the organization-based career development models. As work life gets more competitive, career development becomes more dependent on employees than on organizations. It might be said that the organizations expect their employees themselves to take steps to improve their careers. That is why, personal growth initiation, which means a positive and proactive stance towards change and constant personal development (Robitschek, 1998) has great potential to become an important concept in the human resource and organizational behavior fields. In addition to the burden placed upon the employees' shoulders by the competitive climate of today's work life, organizations might lack the resources to provide a wide range of development models addressing different needs of each and every employee, and even if they do it might be quite impractical to implement that wide range of models. Especially at the organizations where the expertise fields of the employees display a great deal of variety, such as the higher education institutions, career development models provided by the organizations might not meet the developmental aspirations the employees crave. Besides, a desire for constant development and renewal might be seen as a natural requirement of employment in higher education institutions whose employees are mostly academicians. Because in order to reach the tremendous speed of scientific research, the existence of personal interest and effort to grow are the qualities that one must to have. This is the reason why it has great importance for faculty members to put their own growth initiation skills into practice. Along with meeting employees' professional needs, personal growth initiative has an influence on an array of organizational outcomes. The research shows that personal growth initiative has an effect on personal and organizational outcomes as academic success (Matsuo, 2019), positive affection (Malik et al., 2013), career exploration and professional identity (Robitschek, 1999; Shorey et al., 2007), determination, problem-based management and goal setting (Shorey et al., 2007).

When professional requirements, personal and organizational outcomes are taken into consideration, it is critical to understand the factors that might have an influence on personal growth initiative. Previous research has established that person-organization fit, work empowerment and authentic leadership (Joo et al., 2020), impression management (Madan and Srivastava, 2017), self-efficiency and risk-taking behavior (Ogunyemi and Mabekoje, 2007) are the possible antecedents of personal growth initiative. In the frame of Social Exchange Theory (Blau, 1964) it can be assumed that organizational support might as well be one of the factors that has influence on personal growth initiative. The employees who feel the support of the organization would have a high opinion about their work and would be more motivated to put more effort into personal growth, which contributes to the organization. The literature has already documented the positive outcomes of organizational support. It might increase organizational commitment (Boz et al., 2017) and performance (Turunç and Çelik, 2010), decrease turnover intent (Fındıklı, 2014); predict

higher levels of organizational citizenship behaviors (Claudia, 2018). Thus, it is believed that organizational support will influence the employees' proactive stances towards the constant growth and change.

The mechanisms underlying a possible relationship between organizational support and personal growth initiative is another issue that needs examination. It is assumed that organizational support might influence personal growth initiative through self-efficacy. In the organizational research literature, there is evidence reporting that the perceived organizational support might have an influence on employees' self-efficacy beliefs (Caesens and Stinglhamber, 2014). As Eisenberger and Stinglhamber (2011) argue, organizational support increases employees' interests in their work by supporting their self-efficacy beliefs. Organizational support which includes providing positive feedback to the employees about their performance helps the employees be more open to competency requiring experiences. In addition to being an outcome of organizational support, several empirical studies demonstrated that self-efficacy is an antecedent to many organizational outcomes such as proactive work behavior (Parker et al., 2006; Ohly and Fritz 2007; Parker and Collins, 2010) and general performance (Stajkovic and Luthans, 1998). Furthermore, recent studies demonstrated that self-efficacy influences personal growth initiative (Çankaya et al., 2017; Ogunyemi and Mabekoje, 2007; Sharma and Rani, 2014; Stewart, 2014). This might be explained with the Social Cognitive Theory, which argues that people with high self-efficacy are more prone to take action and more insistent in their efforts (Wood and Bandura, 1989). Thus, it is assumed that it is more likely for the people with high self-efficacy to be more proactive in growth and change.

In brief, it is vitally important to investigate faculty members' personal growth initiative level in today's competitive work life and determine the factors playing a role in it. It is believed that the employees feeling the support of their organizations will care more about their personal growth, and moreover, it is predicted that as a possible outcome of organizational support and predictor of personal growth initiative, self-efficacy will play a mediating role between the two. As far as the extant literature shows, there is a dearth of research about personal growth initiative of working people (Joo et al., 2020; Matsuo, 2019; Srivastava and Singh, 2020) and most of the research focused on fields of education and psychology (e.g. Beri and Jain, 2016; Luyckx and Robitschek, 2014; Malik et al., 2013; Shigemoto, Ashton and Robitschek, 2016). The research in Turkey is limited to a few (Abacı and Okyay, 2013; Büyükgöze, 2015; Çelik, 2015) and they focused on students (Abacı and Okyay, 2013; Büyükgöze, 2015). In the foreign and Turkish research literature, it was observed that no previous study had investigated personal growth initiative of faculty members, and little research had been conducted on the possible organizational predictors of personal growth initiative (Joo et al., 2020). In this regard, there are mainly two important areas where this research makes an original contribution to the personal growth initiative literature. The research fills a gap in the literature by exploring faculty members' personal

growth initiative and enhancing our understanding about how organizational factors influence it.

Theoretical Framework

Personal Growth Initiative

As indicated above, personal growth initiative is a positive and proactive attitude towards change and constant improvement (Robitschek, 1998). According to Robitschek et al. (2012), who developed the first scale of the construct, personal growth initiative has four components named as 'readiness for change', 'planfulness', 'using resources', and 'intentional behavior'. Readiness for change means to be ready to realize self-change; planfulness indicates knowledge about the planning process needed for self-change and its implementation; using resources signifies adopting the outside resources that will be helpful in self-change, and intentional behavior means purposefully engaging in actions that will help the self-change (Robitschek et al., 2012). Readiness for change and planfulness are the cognitive components including beliefs, attitudes and values about growth initiative. People with a high cognition of personal growth initiative know how and when they will change, and set realistic goals for change (Robitschek, 1998). Using resources and intentional behavior are the behavioral components focusing on action-oriented growth. People with strong behavioral orientation can make use of available outside sources and initiate the behaviors intended for personal growth (Robitschek, 1998; Robitschek et al., 2012).

The previous research has established that personal growth initiative influences a number of positive outcomes. People with high personal growth initiative levels can easily adapt to different situations, can cope up with stressful situations better, have higher life satisfaction levels, and can look for the right solutions for the problems they face (Loo et al., 2014; Robitschek et al., 2012; Weigold et al., 2013). High personal growth initiative has positive relations with higher positive affection, and negative relations with anxiety, depression and negative affection (Hardin et al., 2007; Robitschek and Keyes, 2009). Moreover, there are positive relations between self-respect (Kashubeck-West and Meyer, 2008), self-awareness (Neff et al., 2007) and personal growth initiative. When the organizational research is examined, it was observed that personal growth initiative is in positive relations with employees' determinism, career exploration and subjective well-being (Robitschek, 1998; Shorey et al., 2007). A study in the USA showed that personal growth initiative has a positive effect on job crafting in different occupations (Matsuo, 2019); another study in South Korea with a telecommunication firm employees reported that person-organization fit and work empowerment are significant antecedents of personal growth initiative (Joo et al., 2020). A study with working parents in Taiwan showed that work-family experience (work-family conflict and strength) predicted personal growth initiative (Wang et al., 2015). Srivastava and Singh (2020) found positive relations among personal growth initiative, organizational engagement and employee commitment with the hotel employees in the Northern India. It is concluded that the personal growth initiative

literature has largely focused on the outcomes of it, and there are a limited number of studies about its organizational antecedents. However, as Lewin (1936) proposed in his Field Theory, behaviors are the function of a person with a past, personality and motivation and the environment composed of its physical and social fields. In this frame, perceived organizational support might be viewed as one of the environmental factors that might have an influence on personal growth initiative.

Organizational Support

Eisenberger et al. (1989) defined perceived organizational support as employees' general perception regarding the extent to which the organization values their contribution and cares about their well-being. Özdevecioğlu (2004) explained it as employees' feeling the organization's power at their back. Organizational Support Theory rooted in Social Exchange Theory is a modern exchange theory arguing that employees exhibit positive work outputs in return for the payments, training, socio-affective support they receive from the organization (Michael et al., 2005). According to the Organizational Support Theory, employees personify organizations and attribute humanistic features onto the organizations. When the organization is personified, employees perceive positive or negative treatment from their organizations as indicators of support or rejection by the organization (Rhoades and Eisenberger, 2002). Rhoades and Eisenberger (2002) suggest that in accordance with the reciprocity norm, when organizational support is perceived, employees want to exhibit extra-role behaviors which will contribute to the organizational goals and feel an urge to commit to their organizations (Zhang et al., 2017). Empirical evidence reports that perceived organizational support affects employee well-being, positive disposition for organization and work, and behavioral outcomes in benefit of organization's welfare (Eisenberger and Stinglhamber, 2011). Edwards and Peccei (2010) evidenced that organizational support was a significant predictor of organizational engagement, organizational participation, and turnover intent. In their meta-analysis Ahmed et al. (2015) found that organizational support had a significant effect on engagement, job satisfaction, organizational commitment and turnover intent. Organizational support might be one of the antecedents of personal growth initiative in many ways. Personal growth initiative might be evaluated as a behavioral outcome benefiting organizational welfare. Within the frame of Social Exchange Theory employees feeling the support of their organization which value employee contributions will have a positive stance towards change and development which will be to the advantage of both themselves and organizations; and moreover, they will think that they will find the support that they will need in change and development processes. Organizational support might have either direct effect or indirect effect through underlying mechanisms on personal growth initiative. One of these underlying mechanisms might be self-efficacy which is indicated as one of the organizational support outcomes (Caesens and Stinglhamber, 2014) and antecedents of personal growth initiative (Ogunyemi and Mabejoke, 2007).

General Self-Efficacy

Self-efficacy construct developed by Bandura in his Social Cognitive Theory can be defined as individuals' beliefs in their capabilities to realize the behaviors needed for the desired outcomes, their judgments about their skills and ability to handle their environment (Bandura, 1977; Lönnfjord and Hagquist, 2018). Self-efficacy affects how individuals feel, what they think, how they motivate themselves and how they behave. When the self-efficacy beliefs are high, individuals increase the goals they set for themselves and their beliefs in themselves and their determination augments. It was elaborated that self-efficacy had positive effects on various behavioral and attitudinal work outcomes such as work engagement (Caesens and Stinglhamber, 2014); performance (Judge and Bono, 2001; Prussia et al., 1998); job crafting and work enjoyment (Judge and Bono, 2001); job satisfaction, task performance and organizational citizenship behaviors (Özyılmaz et al., 2018) Although self-efficacy has generally been evaluated as an outcome variable, environmental factors can influence self-efficacy perceptions. According to Kurtessis et al. (2015), one of those environmental factors is organizational support. As Social Cognitive Theory argues, employees change their perceptions in line with their perceptions; it might be argued that their beliefs in how efficient they are can be fostered in a supportive environment. As Bandura (2000) posits, self-efficacy perceptions are nourished by four sources which are active competency experiences, secondary experiences, verbal persuasion and physical and emotional states. Organizational support can foster self-efficacy perception by inducing many of these sources (Caesens and Stinglhamber, 2014).

In this research it is suggested that organizational support might influence personal growth initiative through self-efficacy perceptions. Because the literature shows that self-efficacy which is an outcome of organizational support is an important antecedent to personal growth initiative (Beri and Jain, 2016; Çankaya et al., 2017; Çelik, 2015; Ogunyemi and Mabejoke, 2007; Sanders et al., 2016; Sharma and Rani, 2013). Sharma and Rani (2014, 2013) found that all the four components of personal growth initiative had positive relations with general self-efficacy dimensions. Weigold et al., (2013) reported that all components of personal growth initiative have high relations with personal resources such as self-efficacy. In short, self-efficacy is a possible outcome of organizational support and antecedent to personal growth initiative, and therefore in this research it is argued that organizational support will affect personal growth initiative through self-efficacy.

Purpose of the research

There are two primary aims of this study: 1. To investigate the relationship between organizational support perceptions and personal growth initiative levels of the faculty members working in Turkey and 2. To examine the effect of self-efficacy perceptions in this relationship. In line with these aims the study inquires about the following hypotheses:

Hypotheses of the study

H1: Faculty members' organizational support perceptions have a significant effect on their personal growth initiative levels.

H2: Faculty members' organizational support perceptions have a significant effect on their self-efficacy perceptions.

H3: Faculty members' self-efficacy perceptions have a significant effect on their personal growth initiative levels.

H4: Faculty members' self-efficacy perceptions have a mediating effect on the relationship between their organizational support perceptions and personal growth initiative levels.

Test model for the research hypotheses was developed as such:
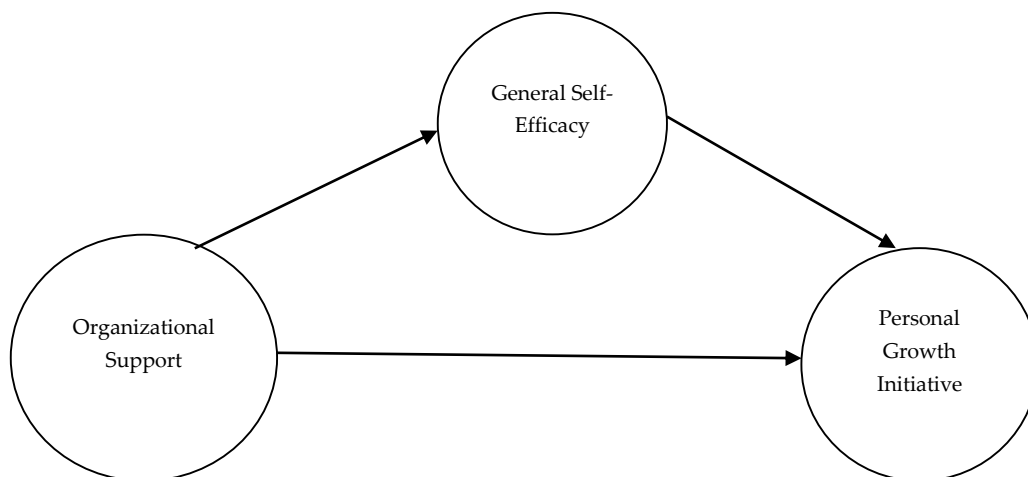
Figure 1. Theoretical Model of the Research

METHOD

Research Model

This research was designed as a relational survey model. Relational survey model is a survey approach which aims to determine whether there is a common change in two variables (Karasar, 2011). In this research the relation between faculty members' organizational support perceptions and personal growth initiative, and the effect of self-efficacy beliefs in this relationship were examined.

Participants

The population of this research consisted of all the faculty members working in state universities in Turkey - professors, associate professor doctors, assistant professor doctors, lecturers and research assistants. Turkish Higher Education Council statistics shows that the number of faculty members in state universities in Turkey was 153.518 in 2021-2022 academic year (istatistik.yok.gov.tr). From this population, 346 faculty members,

communicated on voluntary participation basis and convenience sampling technique, comprised the research sample. Descriptive features of the sample are presented in Table 1.

Table 1

Participants

Variable	Group	n	f	Total
Gender	Female	143	41.3 %	346
	Male	203	58.6 %	
Age	24-35	118	34 %	346
	36-45	164	47.3 %	
	45+	64	18.4 %	
Title	Research Assistant	59	17 %	346
	Lecturer (Teaching)	90	26 %	
	Lecturer (Non-teaching)	11	3 %	
	Assistant Professor Doctor	110	31.9 %	
	Associate Professor Doctor	60	17.3 %	
	Professor Doctor	16	4.6 %	
Work Experience	1-5 years	93	26.8 %	346
	6-10 years	88	25.4 %	
	11-15 years	106	30.6 %	
	16-20 years	24	6.9 %	
	21-25 years	22	6.3 %	
	26+ years	13	3.7 %	

As seen in Table 1, assistant professors composed the biggest group in the sample (%31,9). The faculty members' work experience was mostly between 11 and 15 years (%30,7). In addition to the information provided in the table, the distribution of faculty members according to their scientific field was in this order: education (n= 104), social sciences, journalism and information (n= 98), health and welfare (n= 47), art and human sciences (n= 29), engineering, production and construction (n= 28), nature sciences, mathematics and statistics (n= 15), business, management and law (n= 13), agriculture, forestry, fishery and veterinary (n= 6), informatics and communication technologies (n= 5), services (n= 3). (The fields were determined in accordance with ISCED 2013).

Data Collection Tools

In this research three scales were applied in addition to demographic information questions. The first one was the General Self-Efficacy Scale (GSES) developed by Jerusalem and Schwarzer (1989), and adapted to Turkish by Aypay (2010). This Likert-type scale has 10 items, assessed on 5 points. GSES has two dimensions as "effort and resilience", and "competence and confidence". The highest score of the scale is 50 points; the higher score means the participants feel more self-efficient. A sample item from the scale is "I can always manage to solve difficult problems if I try hard enough."

In order to measure the organizational support, Perceived Organizational Support Scale (POSS) developed by Eisenberger, Huntington, Hutchison and Sowa (1986) and adapted to Turkish by Deniz-Giray and Şahin (2012) was used. The Likert-type scale has one dimension, 8 items, 4 of which (1,4,6,8) are positive and the other 4 (2,3,5,7) are negative sentences. The highest score of the scale is 40 points; the higher score means the participants perceive more support from their organizations. A sample item from the scale is "The organization values my contribution to its well-being."

Personal Growth Initiative Scale-II (PGIS-II) developed by Robitschek et al. (2012) and adapted to Turkish by Yalçın and Malkoç (2013) was used to measure faculty members' personal growth initiative levels. The scale is composed of four dimensions and has 16 items. The dimensions of this scale are named as "readiness for change", "planfulness", "use of resources" and "intentional behavior". The highest score of the scale is 80 points; the higher score means the participants believe themselves to be more initiative for growth. A sample item from the scale is "I can tell when I am ready to make specific changes in myself."

Data Analysis

The research data was gathered from the state universities in Turkey through an online form, on a voluntary participation basis and informed consent. SPSS 26 and AMOS 24 package programs were used in the analysis process. In the analysis part, normality tests, arithmetic mean, standard deviation, Pearson Moment correlation coefficient calculations were employed as descriptive analyses, and structural equation modeling (SEM) was applied to examine the structural relations among the variables. In this research the direct effect of faculty members' organizational support perceptions on personal growth initiative levels, and the indirect effect of it through self-efficacy were tested. SEM is a useful analysis technique which enables examining the relations among different variables and testing the direct and indirect effects of input variables on outputs. Bootstrap technique (Preacher and Hayes, 2008) was used in calculating the effect size of the relations, confidence intervals of the paths and significance levels. In comparing the effect sizes, standardized estimation scores were examined. Bootstrap technique can estimate the indirect effect of input variable on output variable by 95% confidence intervals. In the research, 2000 sample Bootstrap analyses were employed in calculating the total, direct and indirect effects of the variables by 95% confidence intervals. The effect of the mediating variable is evaluated on the basis of the significance level of the relationship between predictor/independent variable and the outcome/dependent variable when the mediating variable is introduced in the model. If the relationship between the predictor/independent and the outcome/dependent variable reduces when the mediating variable is introduced, there is a "partial mediation"; if the relationship becomes insignificant, there is a "full mediation" (MacKinnon et al., 2007).

Ethical considerations

In this study, all rules stated to be followed within the scope of "Higher Education Institutions Scientific Research and Publication Ethics Directive" were followed. None of the

actions stated under the title "Actions Against Scientific Research and Publication Ethics", which is the second part of the directive, were not taken.

Ethical review board name: Mardin Artuklu University Scientific Research and Publication Ethics Board

Date of ethics review decision: 16.03.2022

Ethics assessment document issue number: 2022/3-3

RESULTS

Confirmatory factor analysis (CFA) and reliability analysis were run on the scales of the variables before the model testing. The acceptable scores of the fit index were taken as $\chi^2/df \leq 5$; RMSEA ≤ 0.08; GFI ≥ 0.90; NFI ≥ 0.90; IFI ≥ 0.90; CFI ≥ 0.90 (Kelloway, 1998; Kline, 2011; Şimşek, 2007). It was observed that GSES, POSS and PGIS-II had acceptable fit index values. Cronbach alpha coefficients and fit index values are presented in Table 2.

Table 2

Fit Index Values of the Scales

	α	χ^2/df	RMSEA	GFI	NFI	IFI	CFI
GSES	0.90	2.90	0.08	0.95	0.95	0.96	0.96
POSS	0.93	3.2	0.08	0.96	0.97	0.98	0.98
PGIS-II	0.92	3.54	0.08	0.90	0.92	0.94	0.95

As shown in Table 2 Cronbach alpha coefficients of the scales were high; CFA and Cronbach alpha coefficients showed that the scales were valid and reliable.

After validity and reliability analysis, descriptive and correlational analyses were conducted in the variables and scale dimensions in the model. When the data were analyzed for normality, it was seen that skewness and kurtosis values for each scale were between -2 and +2, which are considered acceptable in order to prove normal univariate distribution (George and Mallery, 2010). (GSES skewness= -.310, kurtosis= -.024; POSS skewness= -.088, kurtosis= -.663; PGIS-II skewness= -.172, kurtosis=-.578). The mean scores of the scales varied from 3.20 (perceived organizational support) to 4.27 (General self-efficacy, competency and confidence dimension). It was found that faculty members' general self-efficacy beliefs were high (mean= 4.11, sd= 0.56), organizational support perceptions were on average (mean= 3.20, sd= 1.01), and personal growth initiative levels were high (mean= 4.12, sd= 0.55). In Table 3, descriptive statistics and correlations were provided for the variables.

Table 3

Descriptive Statistics and Correlational Results of the Variables

	GSE	E & R	C & C	OS	PGI	Chan.	Plan	Resou.	Purp.
GSE	-								
E & R	.974**	-							
C & C	.915**	.801**	-						
OS	.267**	.250**	.261**	-					
PGI	.616**	.599**	.565**	.280**	-				
Chan.	.603**	.586**	.554**	.244**	.905**	-			
Plan	.636**	.620**	.581**	.237**	.918**	.885**	-		
Resou.	.272**	.265**	.248**	.176**	.635**	.411**	.371**	-	
Purp.	.508**	.493**	.469**	.276**	.865**	.687**	.739**	.442**	-
Mean	4.11	4.00	4.27	3.20	4.12	4.18	4.19	3.77	4.21
Standard deviation	.56	.63	.53	1.01	.55	.62	.62	.75	.64

** p<.01, GSE: General self-efficacy; E & R: Effort and resilience; C & C: Competence and confidence; OS: Organizational support; PGI: Personal growth initiative; Chan.: Readiness for change; Plan: Planfulness; Resou.: Using resources; Purp: Purposeful behavior

When the correlation values in Table 3 were examined, it was observed that there was a weak but significant positive correlation between faculty members' general self-efficacy beliefs and organizational support perceptions (r=.267, p <.01); there was a high significant positive correlation between general self-efficacy and personal growth initiative levels (r= .616, p <.01); and between organizational support perceptions and personal growth initiative levels there was a weak but significant positive correlation (r= .280, p <.01).

In order to test the research hypotheses SEM was conducted to test the effect of faculty members' organizational support perceptions on their personal growth initiative levels and the mediating role of self-efficacy in this relation. First of all, the fit of the model was tested and it was observed that fit index values of the test model were within the good levels (χ2/df=2.35; RMSEA=.06; TLI=.96; IFI=.97; CFI=.97). This finding led to the conclusion that the test model was in good fit with the data. Test model with the standardized values was presented below in Figure 2.
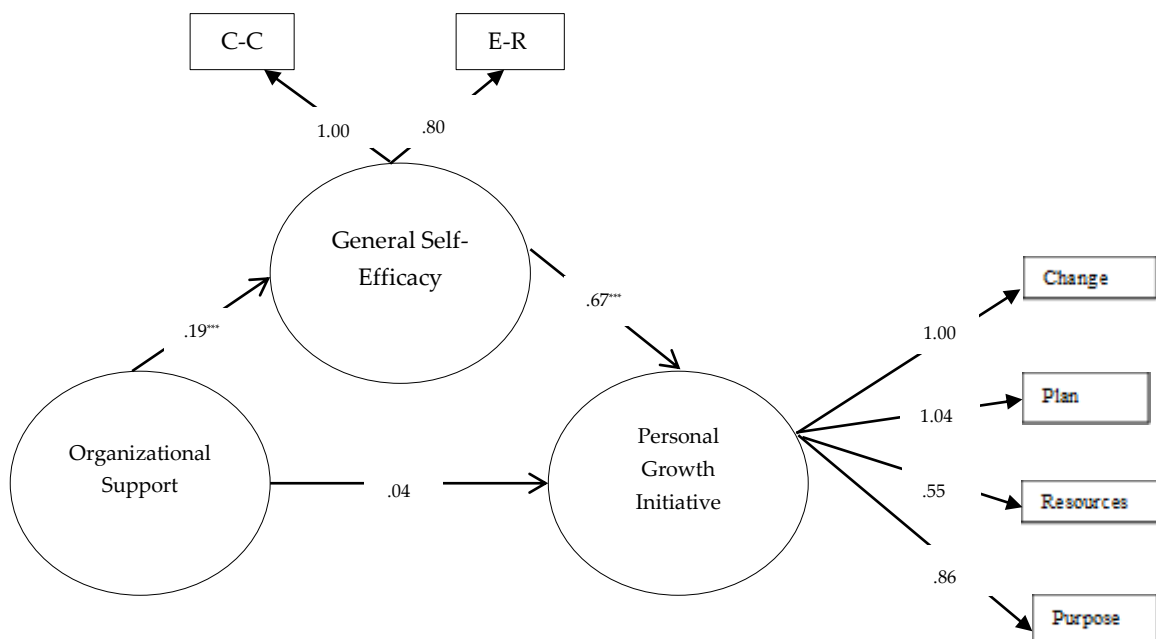
Figure 2. SEM Results for the Structural Relations among the Variables

** p<.01, E & R: Effort and resilience; C & C: Competence and confidence; Change: Readiness for change; Plan: Planfulness; Resources: Using resources; Purpose: Purposeful behavior

After the test model was verified, the research hypotheses were tested by the latent variable model. Bootstrap based regression analysis was applied in order to test the mediating role of general self-efficacy beliefs in the effect of the faculty members' organizational support perceptions on their personal growth initiative levels. In Table 4 below, total, direct and indirect effects among organizational support, personal growth initiative and general self-efficacy beliefs were provided.

Table 4

Bootstrap Results for Organizational Support, Personal Growth Initiative and General Self-Efficacy Model

Construct	Standardized Estimate	Product of Coefficients		95% Bootstrap CI		R^2	p
		SE	Z	Lower	Upper		
Standardized total effects							
OS→PGI	.282	.057	-	.171	.397	-	***
Standardized direct effects							
OS→GSE	.316	.034	5.462	.210	.429	.100	***
GSE→PGI	.676	.054	12.409	.577	.758	-	***
OS→PGI	.068	.027	1.447	.-028	.163	.490	.148
Standardized indirect effects							
OS→GSE→PGI	.214	.041	-	.079	.180	-	***

GSE: General self-efficacy; OS: Organizational support; PGI: Personal growth initiative

As shown in Table 4, standardized total effect in the relation paths evidenced that faculty members' organizational support perceptions had a significant direct effect on their personal growth initiative levels (β = 0.282, p < .001). Thus, Hypothesis 1 was supported. This finding shows that as faculty members' organizational support perceptions get higher, they would be more willing to pursue personal growth. When the standardized relation paths were examined, it was seen that organizational support perceptions had a significant effect on general self-efficacy beliefs (β = 0.316, p < .001). So, Hypothesis 2 was supported, too. This finding implies that faculty members' self-efficacy beliefs might be influenced by the organizational support they receive. Furthermore, when the effect of general self-efficacy beliefs on personal growth initiative levels was examined, a significant effect was observed (β = 0.679, p < .001). Hence, the third hypothesis was confirmed. This finding indicates that faculty members with higher self-efficacy beliefs might tend to invest in their growth more. However, it was found that the effect of organizational support was not significant when self-efficacy was included in the model as a mediator variable (β = 0.068, p >.001). The bootstrapping analysis results showed that organizational support had a significant positive indirect effect on personal growth initiative through the mediation of general self-efficacy (β = 0.214, p < .001). By this result it was evidenced that faculty members' self-efficacy beliefs fully mediated the relationship between perceived organizational support and personal growth initiative levels. This finding supported Hypothesis 4.

DISCUSSION

This study aimed to investigate the relationship between faculty members' organizational support perceptions and their personal growth initiative levels, and to examine the mediating role of general self-efficacy beliefs in this relationship. The first hypothesis suggesting the effect of organizational support on personal growth interest was supported, which provides evidence for organizational support theory. According to organizational support theory people personalize organizations by attributing human characteristics to them and build positive social exchange relations with the supportive organizations (Eisenberger et al., 2001). According to the reciprocity norm (Gouldner, 1960) and social exchange theory (Blau, 1964) organizational support creates a feeling of task responsibility on the individuals so that they want to contribute in the organizational development and effectiveness (Eisenberger et al., 1986). In other words, those who perceive the support of their organization feel an urge to respond by exhibiting positive attitudes and behaviors towards the organization (Rhoades and Eisenberger, 2002). In this frame, it might be said that organizational support enhances a proactive attitude towards a constant personal change and development, which is personal growth initiative; employees respond in a positive way to the support by developing themselves. Employees' positive responses to organizational support were reported in various research. For example, organizational support predicts an increase in affective commitment and organizational citizenship behaviors (Hayton et al., 2012; Kurtessis et al., 2015), and a decrease in absence, turnover intent (Kalemci-Tuzun and Kalemci, 2012) and deviant behaviors (Van Emmeri, et al., 2007; Geddes and Stickney, 2011). In addition to the outcomes of reciprocity and social exchange, the perception of organizational support help employees think that they can reach the support in time of need (Cohen and Wills, 1985) this increase emotional and psychological resources they use in dealing with daily stress and decrease their vulnerability to stress (Jex, 1998). In this vein, it might be said that organizational support contributes to employees' resources which could be useful in handling the challenges of the change and growth, and this is why organizational support influences personal growth initiative in a positive way.

Another hypothesis supported by the research was that faculty members' organizational support perceptions had an effect on general self-efficacy beliefs. An explanation for this result might lie in Bandura's Social Cognitive Theory (1997) which suggests that employees construct their beliefs according to their perceptions and with a supportive environment perception they start to believe in themselves. Bandura (2000) argues that people's beliefs in their efficacy are improved by four main sources of influence, including mastery experiences, vicarious experiences, social persuasion, and emotional states. As Caesens and Stinglhamber (2014) points out, organizational support develops people's self-efficacy beliefs by influencing these four sources. Because human acts are not simply the result of their own decision but of the interplay among internal variables, behaviors and environmental factors (Bandura, 1986). Similarly, self-efficacy is a product of internal variables, people's behavior and the environmental factors affecting these behaviors

(Bandura, 2012). It can be inferred that organizational support is one of the environmental factors increasing one's self-efficacy belief. The research, although limited in number, shows that those who feel the support of their organizations and to be valued have a higher level of self-efficacy (Caesens and Stinglhamber, 2014; Kurtessis et al., 2015). In addition to support, other organizational factors were reported to have an effect on self-efficacy beliefs. For example, learning organization culture (Song et al., 2018), supervisor incivility (Alola et al., 2018), coaching (Moen and Allgood, 2009), social organization (Lee et al., 1991), employee cooperation (Chester and Beaudin, 1996), organizational learning and climate (Tobin et al., 2006) were found to have relations with employee self-efficacy. Hox's (2002) argument, which suggests that individuals interact with the social context they belong to, is in the same line with this finding.

As another result of the research, it was observed that self-efficacy played a mediating effect on the relationship between organizational support and personal growth initiative, and this result supported the final hypothesis explaining the underlying mechanism in the relationship. The full mediation of self-efficacy in this relationship can also be explained with the arguments of the Social Cognitive Theory. According to Bandura (1997) people with high self-efficacy are more likely to undertake more challenging tasks, they set higher goals and commit to them. Behaviors are planned in mind and when they are enacted people with high self-efficacy put more effort and resist longer compared to those with low self-efficacy; when they face a barrier they can recuperate faster and commit to their goals. Henson (2001) argues that the importance of self-efficacy is in the effects it has on people's choices and behaviors. Self-efficacy plays a key role in enhancing success and motivation. The effect of self-efficacy on personal growth initiative is in line with the previous research. Sharma and Rani (2013) reported that 13 % of the personal growth initiative scores were explained with self-efficacy. Similarly, Ogunyemi and Mabekoje (2007) found that self-efficacy was a significant predictor of personal growth initiative. Stewart (2014) concluded that emotional self-efficacy had an effect on personal growth initiative. Self-efficacy contributes to personal and professional growth by influencing people's preferences about their behaviors and the environment they want to interact with. In this manner, people determine how they live and what they want to be. To sum up, it might be said that people with high self-efficacy have a higher motivation for personal growth. Another point underlined by Social Cognitive Theory is that people are active practitioners in their life; that is they are neither the agents of internal mechanisms nor the passive recipients of environmental influence (Bandura, 2012). This approach might be interpreted for this research in that self-efficacy plays a role on personal growth interest as an internal mechanism and organizational support plays its role on it as an external mechanism.

LIMITATIONS AND RECOMMENDATIONS

Despite being pioneer research investigating faculty members' personal growth initiative and explaining the effect of organizational and individual variables on it, the research bears some limitations. The first limitation is that the research was based on cross-sectional data, which might cause a higher correlation among the variables and so harm the causality. In order to overcome this limitation, it is recommended the future research be based on longitudinal data. By this way, the researchers can observe the causal relations better. Another limitation is about the sampling technique applied in the research. This study which applied the convenient sampling technique is limited in generalizability. The researchers can conduct new ones with the faculty members of the universities with different ranks and sizes. Besides, investigating organizational support perceptions, general self-efficacy beliefs, personal growth initiative levels and the relations among them in different cultural contexts can increase generalizability. Another limitation is about the analysis methods, which interpret all the participants in the same cluster. That is, the participants are in different stages of their career but in the research, they were treated as a whole unit. However, faculty members at their different career stages could have different growth attitudes. In this respect, the research investigating the personal growth initiatives of those in different stages can add valuable findings to the literature. Lastly, further research can be made on other personal or environmental variables, such as locus of control, leadership styles, organizational thrust, psychological capital, social support that can play a predictor, mediator or moderator role on personal growth initiative. In addition to these variables, when the effect of self-efficacy on personal growth initiative is taken into account, it can be very useful to investigate other organizational variables that might have an effect on self-efficacy.

Beside research recommendations, there are practical recommendations for university managers. As aforementioned, in this research it was suggested and supported that faculty members' organizational support perceptions and self-efficacy beliefs were antecedents of their personal growth initiative levels. Hence the first step that might be taken by the managers at the universities is to look into the ways by which the organizational support can be increased. Although there is not a one-fit-all solution to increase organizational support, university managers can start with developing their 1-on-1 communication with their team, because it might help strengthening the relationships between the leader and their teams, and give an opportunity for providing personalized and meaningful feedback. In order to enhance faculty members' self-efficacy beliefs university managers can apply coaching and mentoring plans, set appropriate, attainable goals, and provide training and education opportunities for them. In addition, it is very important that university managers themselves convey the right message about personal growth. It is known that a high number of work attitudes and behaviors have a top-down effect. It can be recommended for university managers to inquire how much effort they put on their growth and if they value the members' who are keen on initiating their growth. Not only the tangible but the

intangible rewards, such simple as acknowledging success, might help faculty members' being more prone to develop themselves.

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Research

High School Dropout Dilemma in America and the Importance of Reformation of Education Systems to Empower All Students

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Abstract:

Dropout happens when a student withdraws themselves from school at any level of education without a certificate to account for their education. It is an educational problem in America because of its negative consequences on society. Three-quarters of the fastest-growing occupations require more than a high school diploma, and yet, just over half of American citizens acquire that extent of education. Out of the industrialized nations, America holds one of the most significant high school dropout rates. Half of the students who begin college will never finish. School dropouts are intelligent individuals capable of offering a lot to the world. However, because they never complete their studies, their abilities may never transpire to their full effectiveness. Hence, solving school dropouts is key to national development. Adolescents who drop out of school vary in demographics and socioeconomic status. There is also a correlation between students with disabilities and the dropout rate. This paper discusses school dropouts in the United States to contribute to its solutions. It examines the causal factors and the effects of school dropouts on individuals and society. School dropout is prevalent among vulnerable groups, and the cost to disadvantaged individuals, families, communities, and nations is high. Since school dropout status has negative consequences, moderating this dilemma benefits the individual and broader society, locally and globally.

Keywords: Drop out, education system, high school, poverty, vulnerable students.

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INTRODUCTION

School dropout happens when a student leaves school at any level of education without a certificate to account for their schooling period and education (Doren et al., 2014; Glennie et al., 2012; Mennen et al., 2022; Nittle, 2019; Plasman & Gottfried, 2018). "The *status dropout rate* represents the percentage of 16- to 24-year-olds who are not enrolled in school and have not earned a high school credential (either a diploma or an equivalency credential such as a General Educational Development certificate)" (U.S. Department of Education, 2021). School dropout is a global educational phenomenon and a problem because of the negative consequences it has on the student, family, community, nation, and society (Alliance for Excellent Education, 2007; Irwin et al., 2021; Levin & Belfield, 2007; Mennen et al., 2022). Individuals are the smallest units of families that play a critical role in the growth and development of communities and heritage (Moll et al., 1992). Hence, students who drop out of school are a wasted investment by the families, communities, and countries since these children and youth do not have a chance to display their knowledge and skills and use their experiences or repertoires to benefit self and their society (Mennen et al., 2022; U.S. Bureau of Labor Statistics, 2021; Willits et al., 2013).

School dropouts are vulnerable to economic, political, social, and climatic changes (U.S. Bureau of Labor Statistics, 2021). They have limited knowledge and skills to adapt to new emerging situations that often are fraught with opportunities and challenges. The economic problems weaken school dropouts. Furthermore, this leads to the erosion of their confidence, making it difficult for them to adapt or manage positively during uncertain times. The ripple effect of this instability experienced by school dropouts is endured by the family, community, and society. School dropouts lead to lost opportunities in all human realms, including education, labor, health, security, and businesses (Obinna & Ohanian, 2020; Peguero et al., 2018). It contributes to the wastage of resources and increased debt, both to the individual and governments (Alliance for Excellent Education, 2007; Glennie et al., 2012).

Three-quarters of the fastest-growing occupations require more than a high school diploma (e.g., nurse practitioners, wind turbine service technicians, solar photovoltaic installers). And yet, slightly over half of American citizens have that education level (Irwin et al., 2021). The United States has one of the highest high school dropout rates of any industrialized nation (Lee & Polachek, 2018). Half of the students who begin college will never finish. United States has invested in addressing the school dropout problem, which has yielded positive results (U.S. Department of Education, 2021). The status dropout rate is the percentage of 16- to 24-year-olds who are not enrolled in school and have not earned a high school credential (either a diploma or an equivalency credential such as a GED certificate). In 2019, the overall status dropout rate decreased from 8.3% in 2010 to 5.1% in 2019. This decrease was reflected among the different student populations. The status dropout rate for Asian 16- to 24-year-olds was 1.8%, that of White was 4.1%, those with Two

or more races were 5.1%, Black was 5.6%, Hispanic was 7.7%, Pacific Islander was 8.0%, and American Indian/Alaska Native was 9.6%. Still, over 2 million students ages 16 to 24 never complete their high school education (U.S. Department of Education, 2021). Therefore, solving school dropouts is crucial to national development. Addressing school dropouts is key to rebuilding individual confidence, preventing and recovering community losses, and making nations safer and stronger (Obinna & Ohanian, 2020; Peguero et al., 2018). Making learning institutions friendly to all learners is vital to empowering all students with the knowledge and skills needed to compete for opportunities in a neoliberalized globalized market economy. This article discusses the predicaments of school dropouts and presents ideas related to school dropouts in the United States for plausible solutions locally and globally. It offers strategies for educators to implement to decrease dropout rates.

LITERATURE REVIEW

High school dropouts affect high-income and low-income countries (Alliance for Excellent Education, 2007; Levin & Belfield, 2007). The current predicament facing secondary education in the U.S. is the high dropout rate among students (Doren et al., 2014; McMurrey, 2014). School dropout in the U.S. is at its highest point in the current years of formal education (Irwin et al., 2021; U.S. Department of Education, 2021). Compared to other high-income countries (e.g., Belgium, Britain, Finland, France, Germany), the U.S. has one of the highest high school dropouts (Lee & Polachek, 2018; McMurrey, 2014; The White House Office of the Press Secretary, 2009). Numerous studies have looked into multiple causal factors of school dropouts, focusing on the demographics of students, including disability, race, school factors, and socioeconomic status (Doll et al., 2013; Dunn et al., 2004; Nittle, 2019; Plasman & Gottfried, 2018). Researchers have also examined how schools manage the dropout epidemic (Nittle, 2019). Many factors, such as teen pregnancy, race, class, region, religion, and the disability of students, influence the dropout of students (Blackorby et al., 1991; Doll et al., 2013; Dunn et al., 2004; Heissel, 2019; Kortering & Braziel, 1999a; Nittle, 2019). Many students predisposed to school dropouts are minorities, those with a meager income, those that are 18 years or older, those who have disabilities, those who are pregnant and/or parenting, and those who are homeless or housing insecure (Blackorby et al., 1991; Glennie et al., 2012; Masterson, 2021; Obinna & Ohanian, 2020; Peguero et al., 2018). Impoverished environments further predispose children and youth to harsh conditions that harm their socio-emotional wellbeing and negatively affect their predisposition or personalities (Glennie et al., 2012; Lee & Polachek, 2018). The assumption that expectant teenage students and students with a learning disability have behavioral problems leads to a potential exiting before high school completion.

Some school environments are less stimulating to students; they lack the initiative to motivate disadvantaged students to graduate (Doren et al., 2014; Glennie et al., 2012; McWilliams et al., 2000). In addition, some schools figure with their demographics that there

will be a consistent failure rate due to the socioeconomic statuses of students and their family's lifestyles (Moll et al., 1992). McWilliams and colleagues (2000) noted that much of the dropout research has focused on fixed attributes, such as minority and low socioeconomic status, which are beyond the control of the school and have been used as an excuse not to do anything to address the dropout problem (Dunn et al., 2004). However, definite stresses do sequentially line up when a student (who is not yet at maturity level) manages themselves in a situation. The remedy to this solution may lie within the school's means of assistance. In sum, even though students with disabilities show a high dropout rate (Bakken & Kortering, 1999), it is encouraging to recognize that some of the variables associated with dropout are alterable and can be addressed through proactive programming (Dunn et al., 2004; Lee & Polachek, 2018).

Previous studies have focused on the dynamics determining the outcome of the situations leading to poor school performance (Glennie et al., 2012; Irwin et al., 2021; Moll et al., 1992) and exiting school without a diploma (Doren et al., 2014; Lee & Polachek, 2018). The dynamics include demographics, socioeconomic status, race, school factors, and disability, immigration status (Doll et al., 2013; Obinna & Ohanian, 2020). Indicators of data collection on low-income, minority families, and household locations present that the backgrounds of students of these factors are more likely to drop out of school than their peers (Blackorby et al., 1991; Peguero et al., 2018). Research has shown many legitimate statistics for students falling under these demographics and socioeconomic statuses. For example, teen pregnancy setbacks demonstrate a higher range of variable difficulties in high school (Heissel, 2019; Masterson, 2021; Nittle, 2019). In addition, teen mothers display a marked decrease in test scores, an increase in grade repetition and high school dropout, and a decrease in college attendance and graduation relative to female students who had been on a similar trajectory before birth (Heissel, 2019).

Studies have shown that students with a disability are more likely to drop out than those without a disability (Doll et al., 2013; Doren et al., 2014; Irwin et al., 2021). Some factors leading to this lie within the school. For example, some schools do not want to take in resources and time, especially if the student with a learning disability or assumed disability exhibits nonconforming, erroneous, or challenging behavior (Blackorby et al., 1991; Doll et al., 2013; Heissel, 2019; Moll et al., 1992; Nittle, 2019; Peguero et al., 2018). This also leads to educators losing confidence in their students with disabilities to graduate high school.

METHOD

This study uses archival research to examine the school dropout in the United States. Various documents about school dropouts were analyzed during the process. Archival findings were compared with the literature findings from empirical and extant work. Sources of data included U.S. government reports (e.g., reports from the Departments of

Education, Labor, Housing and Urban Development) (U.S. Bureau of Labor Statistics, 2021; U.S. Census Bureau, 2022; U.S. Department of Education, 2021; U.S. Department of Labor, 2021), non-governmental institutions (Child Trends Databank, 2018) or national organizations reports (e.g., World Bank, World Health Organization) (https://usafacts.org/data/topics/people-society/education/k-12-education/high-school-dropout-rate/), national and international media reports (New York Times), and social media [e.g., Facebook, WhatsApp]) (Levin & Belfield, 2007). The primary data source was the National Center for Education Statistics (NCES) which collects, analyzes, and makes available educational data in the U.S. and other nations (https://nces.ed.gov/). The NCES data only includes dropout rates for high school students from public school districts. The NCES data is widely used, although some schools underreport the number of students who have dropped out as having transferred to other schools primarily because of accountability measures (Lee & Polachek, 2018). For these reasons, the authors gathered more data through observations and recollections of their experiences in their communities in various locations in the U.S. between 2019-2022. Authors reflected on their interactions with struggling individuals/families and happenings in schools and communities. These helped with the triangulation of data.

Data retrieval and analysis involved perusing each document or website by keeping records of various information about high school dropouts in the United States. The researchers conferred and compared notes to ensure correct data was recorded.

RESULTS

Nearly half of American citizens have a high school level of education. At the same time, three-quarters of the fastest-growing occupations in the neo-liberalized globalized, digitized market economy require more than a high school diploma (Irwin et al., 2021). However, the United States has one of the highest high school dropout rates of any industrialized nation, although the dropout rates have declined over the decades (U.S. Department of Education, 2021). An average of 2 million students drop out of high school in the United States every year, and around 25% of first-year high school students fail to graduate on time. The graduation rates of Hispanic and African American students lag that of Asian-American and white students (Murnane, 2013). Nearly 2,000 high schools in the U.S. graduate less than 60% of their student population (Balfanz & Legters, 2004; Murnane, 2013). The dropout factories (i.e., a high school having a high proportion of students who drop out before completing their course of study) account for over 50% of the students who leave school yearly (Alliance for Excellent Education, 2007). One in six students attend a dropout factory, and one in three minority students (32%) attend a dropout factory, compared to 8% of white students (Balfanz & Legters, 2004).

The dropout rates among 16- to 24-year-olds have declined in the past four decades (Chapman et al., 2011; Child Trends Databank, 2018; U.S. Department of Education, 2021). The dropout rate has declined considerably, from 15% in 1970 to 6% in 2016 (Child Trends Databank, 2018). See Tables 1 and 2. It also decreased from 12.1% in 1990 to 7.4% in 2010 and from 8.3% in 2010 to 5.3% in 2020 (National Center for Education Statistics, 2022). The decrease in dropout rates was sustained among 16- to 24-year-olds with different demographics and socioeconomic statuses, including disability.

Table 1

Dropout Rate Among 16- to 24-year-olds by Decades

Decade	1960s	1970s	1980s	1990s	2000s	2010s	2020s
Percentage	27.2	14.96	14.07	12.07	10.93	7.42	5.28

Source: National Center for Education Statistics (NCES)

Table 2

Dropout Rate Among 16- to 24-year-olds by years

Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Percentage	8.3	7.7	7	6.8	6.3	6.0	5.8	5.4	5.3	5.1	5.3

Source: NCES

In 2020, there was a race and ethnicity status differentiation in the dropout rate. The status dropout rates for Asian 16- to 24-year-olds (2.4%) were lower than the rates for Black (4.2%) and White (4.8%). All three rates were lower than the rate for those who were Hispanic (7.4%). The status dropout rate for Asian 16- to 24-year-olds was also lower than that for those of Two or more races (6.5%) and American Indian/Alaska Native (11.5%). Also, the rate for those who were Black was lower than the rate for those who were American Indian/Alaska Native.

Furthermore, the overall status dropout rate for 16- to 24-year-olds decreased from 8.3% in 2010 to 5.3% in 2020. Between 2010 and 2020, the status dropout rate declined for Hispanics (from 15.2% to 7.4%) and Black (from 8.0% to 4.2%). In 2020, the status dropout rates for those who were American Indian/Alaska Native, of Two or more races, White or Asian, were not measurably different from the rates in 2010. In addition, the status dropout rates in 2019—the year before the coronavirus pandemic—were not significantly different from those in 2020 for any racial/ethnic group.

The dropout rates for various groups differed from 2015 to 2019: Hispanic from 15.2% to 7.5 %, American Indian/Alaska Native from 7% to 9.6%, Black from 6.5% to 5.6%, White from 4.6% to 4.1%, Asian from (no record of 2015, but 2017 4.7%) to 1.8%, and of Two or more races from 4% to 5.1%. In 2019, the overall status dropout rate was 5.3% (National Center for Education Statistics, 2022). See Table 3.

Table 3

Dropout Rate by Race/Ethnicity Among 16- to 24-year-olds

Year	1985	1990	1995	2000	2005	2010	2015	2017	2019	2020
Race/ ethnicity	%	%	%	%	%	%	%	%	%	%
Hispanics	27.59	32.37	29.99	27.79	22.45	15.15	9.17	9.46	7.46	7.37
Blacks	15.15	13.24	12.06	13.11	10.44	8.02	6.47	5.67	5.62	4.18
American Indian/Alaska Native	-	-	-	-	-	12.4	7	4.4	9.6	11.5
White	10.43	8.98	8.58	6.93	5.96	5.07	4.56	3.9	4.1	4.8
Asian	-	-	-	-	-	4.1	-	4.7	1.8	2.4
Two or more races	-	-	-	-	-	5.4	4	4	5.1	6.5
Pacific Islander	-	-	-	-	-	2	2	2	8.0	-

Source: NCES

As shown in Table 4, the dropout rates for 16- to 24-year-olds born outside the United States were 10.1%, Hispanic 15.8%, Non-Hispanic 4.4%, and the First generation 4.4.%, Hispanic 6.1%, Non-Hispanic 2.2%, Second generation or higher was 5% for Hispanic and Non-Hispanic.

Table 4

Dropout Rates by Immigrant Status Among 16- to 24-year-olds in 2020

Ethnicity	Born outside the United States	First generation	Second generation or higher
Percentage	%	%	%
Total	10.1	4.4	5.0
Hispanic	15.8	6.1	5.0
Non-Hispanic	4.4	2.2	5.0

Source: U.S. Department of Commerce, Census Bureau, Current Population Survey (CPS).

Note:

● Born outside the United States— Children born abroad to U.S.-citizen parents are counted as born in the United States.

● First generation— were born in the United States, but one or both of their parents were born outside the United States.

● Second generation or higher— were born in the United States, as were both of their parents.

The dropout rate by immigrant status and race/ethnicity among 16- to 24-year-olds in 2020 varied. Overall, in 2020, non-Hispanic groups of 16- to 24-year-olds who had been born outside the United States had a higher status dropout rate (10.1%) than those who were first generation (4.4%) and those who were second generation or higher (5.0%). For the Hispanics, the status dropout rate was higher for those who had been born outside the United States (15.8%) than for those who were first generation (6.1%) and those who were second generation or higher (5.0%). Contrastingly, among the non-Hispanic groups, the status dropout rate was higher for both those who had been born outside the United States (4.4%) and those who were a second generation or higher (5.0%) than for those who were first generation (2.2%). In addition, among those born outside the United States and those who were the first generation, status dropout rates were higher for those who were Hispanic than for their non-Hispanic peers. However, the status dropout rate did not measurably differ by Hispanic ethnicity for those who were a second generation or higher. (National Center for Education Statistics, 2022). See Table 5.

Table 5

Dropout Rate by Immigrant Status and Race/Ethnicity Among 16- to 24-year-olds

Year	2020
Percentage	**%**
Born out of U.S.: Hispanics	15.8
1st generation: Hispanics	6.1
2nd generation or higher: Hispanics	5.0
Born out of U.S.: non-Hispanic groups	4.4
1st generation or higher: non-Hispanic groups	2.2
2nd generation or higher: non-Hispanic groups	5.0

Source: NCES

In 2020, the overall status dropout rate for 16- to 24-year-olds differed by age from 2010. The status dropout rate was higher in 2020 than in 2010 for 16-year-olds (5.6% vs. 2.0%) and 17-year-olds (5.8% vs. 3.5%). Contrastingly, the status dropout rate was lower in 2020 than in 2010 for 19-year-olds (5.2% vs. 7.9%) and 20- to 24-year-olds (5.1% vs. 9.3%). The status dropout rate for 18-year-olds in 2020 and 2010 was insignificant. See Table 6.

Table 6

Dropout Rate by Age Among 16- to 24-year-olds

Year	2010	2020
Age	**%**	**%**
16	2.0	5.6
17	3.5	5.8

18	6.8	5.4
19	7.9	5.2
20-24	9.3	5.1

Source: NCES

The status dropout rate differed by disability status in 2017, 2019, and 2020. For example, the rate was 5.1% for 16- to 24-year-olds without a disability, compared with 9.7% for those with a disability in 2020 (National Center for Education Statistics, 2022). See Table 7.

Table 7

Dropout Rate by Disability Status Among 16- to 24-year-olds

Year	2017	2019	2020
Percentage	%	%	%
Students without disability	4.6	4.7	5.1
Students with disabilities	6.2	10.7	9.7

Source: NCES

As shown in Table 8, the status dropout rate also differed by sex status among 16- to 24-year-olds in the past three decades. In 1980 dropout rates for males was 15.08% and females 13.09%, in 1990 male 12.32%, female 10.71%, in 2000 male 19.64%, female 9.87%, in 2010 male 8.49, female 6.33%, in 2020 male 6.2%, female 4.4%.

Table 8

Dropout Rate by Sex Status Among 16- to 24-year-olds

Year	1980	1985	1990	1995	2000	2010	2015	2017	2019	2020
Percentage	%	%	%	%	%	%	%	%	%	%
Male	15.08	13.4	12.32	12.2	19.64	8.49	6.29	6.58	6.0	6.2
Female	13.09	11.78	10.71	11.74	9.87	6.33	5.41	4.95	4.2	4.4

Source: NCES

The status dropout rate also differed by household income among families of 16- to 24-year-olds in the past three decades. In 1980 dropout rates for low income were 27%, middle-lower income 18.1%, middle-upper income 10.7%, and high income 5.7%. In 1990 dropout rates for low income were 24.3%, middle-lower income 15.1%, middle-upper income 8.7%, and high income 2.9%. In 2000 dropout rates for low income was 20.7%, middle-lower income 12.8%, middle-upper income 8.3%, and high income 3.5%. In 2010 dropout rates for low income were 13.8%, middle-lower income 8.9%, middle-upper income 5.1%, and high income 2.5%. In 2015 dropout rates for low income were 9.9%, middle-lower income 7.4%, middle-upper income 4.3%, and high income 2.4%. See Table 9.

Table 9

Dropout Rate by Household Income of 16- to 24-year-olds

Year	1980	1985	1990	1995	2000	2005	2010	2015
Percentage	%	%	%	%	%	%	%	%
Low income	27.0	27.1	24.3	23.2	20.7	17.9	13.8	9.9
Middle-Lower Income	18.1	14.7	15.1	13.8	12.8	11.5	8.9	7.4
Middle-Upper Income	10.7	8.3	8.7	8.3	8.3	7.1	5.1	4.3
High Income	5.7	4.0	2.9	3.6	3.5	2.7	2.5	2.4

Source: NCES

The status dropout rate also differed by employment status among 16- to 24-year-olds in the past three decades. The dropout rates of employed 50.4%, unemployed 17.02%, and those not in the labor force were 32.58% in 1980 and employed 52.44%, unemployed 6.19%, and those not in the labor force 41.37% in 2020. See Table 10.

Table 10

Dropout Rate by Employment Status of 16- to 24-year-olds

Year	1980	1990	2000	2010	2020
Percentage	%	%	%	%	%
Employed	50.4	52.46	56.93	45.8	52.44
Unemployed	17.02	13.33	12.26	18.73	6.19
Not in Labor Force	32.58	34.2	30.81	35.47	41.37

Source: NCES

DISCUSSION

In this section, we discuss the predicaments of school dropouts and present ideas related to high school dropouts in the United States to contribute to its solutions locally and globally. Solving school dropouts is key to national development and society's welfare. Expanding the promise of education in America as well as globally is good for humankind. Increased communication and travel have become more accessible, leading to globalized networks and competition for opportunities and resources. Education has become indispensable in the global economy, whereas the most valuable skill one can sell is knowledge. Thus, a good education is a prerequisite and pathway to opportunities (U.S. Bureau of Labor Statistics, 2021). Three-quarters of the emerging occupations require more than a high school education. Unfortunately, less than half of the population in the United

States has that level of education to participate in the digital capitalist market economy. The problem is exacerbated by the high rates of high school dropouts.

Impact of High School Dropout

School dropout costs individuals, families, communities, countries, and societies (Alliance for Excellent Education, 2007; Glennie et al., 2012). Levin and Belfield (2007) write that each high school dropout costs the United States economy $272,000 due to lower tax contributions, higher reliance on tax-funded medical services, higher rates of criminal involvement, and higher reliance on welfare systems. Students who drop out of high school are disadvantaged in all realms, especially socio-economically, compared to those who earn a high school diploma and above (Alliance for Excellent Education, 2007; Bouchrika, 2021; Glennie et al., 2012). So, they burden society (Levin & Belfield, 2007). High school dropouts experience personal long-term social, and economic consequences that finally negatively impact communities and nations (Glennie et al., 2012; Lee-St. John et al., 2018). In the current neo-liberalized globalized, digitized market economy, having a high school diploma is necessary for enrolling in tertiary institutions and obtaining many minimum-wage jobs (e.g., cashier, security officer) (U.S. Bureau of Labor Statistics, 2021, U.S. Department of Education, 2021).

In America, school dropouts make up nearly half the heads of households on welfare. High school dropouts are likely to live in poverty and have their families in poverty (U.S. Bureau of Labor, 2021). This is because of limited opportunities and their vulnerabilities to harmful environments in adulthood. Limited opportunities for advancement mean that high school dropouts experience poverty-related issues such as "higher levels of alcohol consumption, poorer mental and physical health, and increased likelihood of committing criminal acts and of becoming dependent on welfare and government programs than people with higher educational attainment" (Glennie et al., 2012, p. 3). It is estimated that a high school dropout earns USD200,000 less than a high school graduate over their lifetime and about USD 800,000 less than a college graduate (Cheeseman et al., 2014). Poverty is a catalyst for social ills. Therefore, school dropouts are susceptible to the judicial system hence the school-prison pipeline (Irwin et al., 2022). It is estimated that high school dropouts commit nearly 75% of the crimes in the U.S. (Forhad, 2021; Gerlinger & Hipp, 2020; Obinna & Ohanian, 2020; Peguero et al., 2018; Willits et al., 2013).

Causal Factors of School Dropout

Many factors are attributed to increased student dropout rates in the United States (Bouchrika, 2021; Doll et al., 2013). These include inaccessible curricula, poverty or low socioeconomic status, disasters (e.g., hurricanes, COVID-19), unfriendly school settings, inaccessible infrastructure due to dilapidated facilities or amenities or equipment, limited

or lack of resources (e.g., libraries and computers) and services (e.g., counseling), shortage or ill-equipped educators (e.g., novice or underpaid and unmotivated teachers), economic hardships (e.g., due economic recession, corruption, or unemployment) (Glennie et al., 2012; Lee & Polachek, 2018). Other risk factors are personal conditions such as disability (because of lack of services and resources such as assistive technology, stigma, and prejudice) (Blackorby et al., 1991; Doren et al., 2014), insecurities such as school shootings, criminal victimization, bullying, disciplinary problems and actions, fights, accessibility to weapons, availability and student use/abuse of drugs and alcohol, negative student perceptions of personal safety at school, the presence of security staff at school, and criminal incidents in nearby learning institutions or communities (Bouchrika, 2021; Glennie et al., 2012; Irwin et al., 2022; Obinna & Ohanian, 2020; Peguero et al., 2018). Students also leave school for many reasons, "including academic failure, disciplinary problems, wanting or needing to start work, and having a family or children" (e.g., teenage pregnancy) (Glennie et al., 2012, p. 3).

Curricula have a significant impact on students' performances and school attendance. For example, an inaccessible or unfriendly curriculum predisposes students to high rates of high school dropout. The curriculum affects students learning in many ways. An unfavorable curriculum leads to poor academic performance, grade retention, or unnecessary punishments (e.g., low expectations and bullying). Students who drop out of high school find the curriculum less connected to their learning needs. Usually, these students do not see education as interesting, valuable, and worth their investment and/or sacrifice, especially when taking high-stakes tests. In addition, the high stakes testing policies that mandate grade repetition and high school exit exams are the tipping points for students who struggle academically. These extra demands push these students out of school.

Moreover, some well-established schools push out students deemed weak or having behavioral issues (Glennie et al., 2012). Conversely, high-performing schools attract many students. This happens because families often look for schools that will enhance their children's learning and possibilities of passing examinations and transitioning to better colleges or careers. While improvements in school performance lead to improved success for many students, the pressure for schools to maintain high scores and the best position in the region often works against struggling learners. Schools experiencing pressure to improve their overall performance or accountability score usually pursue this increase at the cost of other student outcomes, including the dropout rate (Glennie et al., 2012).

Poverty is prevalent among American children and youth and is a significant cause of high school dropouts (Lee & Polachek, 2018; U.S. Census Bureau, 2022; Vázquez-Nava et al., 2019). In 2020, the official poverty rate stood at 11.4%: 37.2 million Americans experienced poverty, and 16.1% of people under 18 years lived in poverty (U.S. Census Bureau, 2022), 16 million American children (Rothwell et al., 2019). The disproportionate child poverty rates also negatively affect the learning outcomes of children from minority

groups such as immigrants, Black/African Americans, Hispanic, Indigenous communities, and children with disabilities (Lee & Polachek, 2018; Obinna & Ohanian, 2020; Peguero et al., 2018).

Poverty causes insecurities and hostilities in homes, schools, and communities (Forhad, 2021; Gerlinger & Hipp, 2020; Vázquez-Nava et al., 2019; Willits et al., 2013). Families in poverty experience food insecurities that often lead to children's malnourishment and are also vulnerable to violence (e.g., gender-based violence) because of tensions and competition to survive in the community (Irwin et al., 2022; Mennen et al., 2022; Obinna & Ohanian, 2020; Peguero et al., 2018). U.S. Government combats food insecurity through Title 1 Program. The program provides financial help to elementary and high schools with a high student population from low-income families to help ensure that all children meet challenging state academic standards (https://www2.ed.gov/programs/titleiparta/index.html). Still, millions of children continue to live in poverty, negatively impacting their education. Lack or limited shelter, clean water, electricity, Internet, technology (e.g., computers in the home), and limited access to the correct information directly or indirectly impact parents' and students' school participation and academic outcome (Vázquez-Nava et al., 2019) despite those families in poverty hold the same attitudes about education as affluent families (Obinna & Ohanian, 2020).

Thus, addressing education inequities is critical in taming high school dropouts. This requires the reformation of education systems

Reformation of Education Systems

The high school dropout problem will increase through 2022 and the future unless significant improvements are made in the education system. Tackling school dropouts is necessary to rebuild individual confidence, prevent and recover community losses, and make nations stable, safer, and more robust (Obinna & Ohanian, 2020; Peguero et al., 2018). Furthermore, strong, quality, accessible education for all children and youth is necessary to produce skilled and knowledgeable citizens capable of participating in a local and global market economy. Less educated citizens are less prepared to compete in the neo-liberalized globalized market economy. For this reason, it is essential for the United States and other countries to redesign and invest in education to ensure that all children and youth have access to a complete and competitive education. This will allow them to gain knowledge and repertoires needed for them to engage in the wellbeing of the community and nation. Below are measures that the United States should institute to deal with high school dropout issues.

1. Increased Investment in Education

Critical for communities and nations is an investment in education— expanded early childhood education to improve its quality and ensure children have access to formative learning to prepare them for primary and secondary education and college education (The White House Office of the Press Secretary, 2009). Communities and governments must invest in innovative programs that help learning institutions meet high standards, close achievement gaps, and reduce or eliminate school dropouts. Equally important is expanding primary and secondary education by investing in accessible schools. Also, the government and nations must make college affordable for millions of qualified students who miss opportunities due to lack of information, the prohibitive cost of learning, poor economy, and mismanagement of resources. Such measures would incentivize learners to invest and succeed in their studies. At the same time, high schools must be resourced with appropriate facilities and teachers competent in their subject areas to offer quality education with eagerness to learn for children and youth.

Good education benefits individuals and society (U.S. Bureau of Labor Statistics, 2021). Increased investment in education to expand its accessibility to children and youth from low-income families is critical in taming social or human-induced disasters (e.g., crimes) that emerge due to various insecurities, including lack or limited food, water, and shelter (Irwin et al., 2022; Lee-St. John et al., 2018; Obinna & Ohanian, 2020; Peguero et al., 2018; Willits et al., 2013). An improved economic environment increases the quality of living and opportunities for investment in education. Challenging financial situations increase families' vulnerabilities and the possibility of school–age children and youth dropping out of school. Struggling families are more likely to encounter difficulties such as paying tuition fees, having health insurance, and becoming vulnerable to hardships during the economic recession. Therefore, helping students see the value of education requires individuals, society, and governments to invest in areas like energy, health care, and education. These areas support the nation's economic growth so that students can acquire decent jobs upon completion of school and training. Investments in sectors of the economy, particularly in education, are essential in training highly qualified teachers and hiring them so they can educate all learners (Kortering & Braziel, 1999ab; Nittle, 2019).

There is a need for an increased school budget to make school amenities/facilities and equipment accessible and friendly for teaching and learning for all school participants from diverse families and communities. Although it is not apparent that schools with a reasonable budget have a much better influence on students and teachers and so contribute to improved academic performance (Lee & Polachek, 2018), communities and governments must increase the education budget and ensure everyone is accountable to the money invested in education to the benefit of all learners including those from vulnerable communities. In addition, taming school dropouts require significant resources from the government and private sector. The government, however, must be at the forefront of

spurring the private sector to invest in education. In addition, it must create the right conditions for entrepreneurs and new businesses to adapt and thrive in education and other economic sectors (e.g., healthcare).

Investments in all sectors are significant in the education sector's growth and development. An improved economy leads to increased security in all areas, access to quality healthcare, better housing, reduced homelessness, and enhanced wellbeing of the individual, families, and communities. In turn, investment in education is vital in addressing school dropouts. Investments are needed in building new schools to accommodate the increased student population, hiring highly qualified teachers and paying them well to retain them in the field, restocking schools with modern technologies, and adopting robust curricula relevant to the necessities of individuals, families, and society. Given these realities, everyone has to sacrifice some worthy priorities to solve short- and long-term problems. Society cannot afford to ignore short- and long-term challenges. Most importantly is addressing the short-term difficulties. For instance, having all school-aged students back to school requires immediate measures since these children and youth may not be able to return to school past a certain age. It requires new school facilities (e.g., buildings or laboratories) and an increased teacher population to reduce the high teacher-student ratio. A high teacher-student percentage increases the social distance between teachers and students and limits the possibilities of teachers knowing and attending to individual learner needs.

2. Adoption of Progressive Curricula

The curricula are the window through which learners see the value of education. Those who do not see themselves in the curricula are less likely to value that specific education. Those less motivated (because of the exclusionary curriculum) are vulnerable to school dropouts. Therefore, the school curriculum must reflect the needs of a diverse population to encourage their participation in learning. Measures to improve school performance and increase academic performance and graduation rates of students have involved the provision of resources (e.g., increased budgetary) (Lee & Polachek, 2018) and the adoption of high-stake tests as a means of measuring teachers worth (Glennie et al., 2012). Often this has resulted in teaching to test rather than educators' investment in the inculcation of knowledge and skills needed by students to survive and contribute positively to humanity. Tests have become a means of holding teachers accountable to the community and nation. Unfortunately, accountability systems (e.g., high-stakes tests) contribute to discrimination, prejudices, and exclusion of students with disabilities or those at risk, which often lead to increased school dropout (Bakken & Kortering, 1999). Therefore, there is a need to remove any indirect benefit a school may receive from increasing its dropout rate. Instead, learning institutions should be held accountable for students dropping out of school (Glennie et al., 2012). Dropout has high personal and social costs (Glennie et al., 2012).

Therefore, accountability systems should emphasize preventing school dropouts. This can be realized when high-stakes tests and other examinations are adopted to inform teaching rather than pit students, schools, or teachers against each other (Glennie et al., 2012).

Some tests have become a punishment tool that pits students against each other and leads to unhealthy competition among teachers, schools, and communities. Unhealthy school competitions harm vulnerable families, their children, and the larger society (McFarland et al., 2019). Therefore, an appropriate curriculum is necessary for addressing the learning needs of students from marginalized communities, including those with disabilities whose schooling is rarely emphasized (Bear et al., 2006). The curriculum should facilitate learning rather than punish students and force them to quit school. Specifically, school tests should be used to inform best teaching practices that reflect the conditions of learners and the school. Good assessments should guide teaching and learning, help transform learners and teachers, and reform school institutions.

3. Promotion of Friendly Learning Settings

School dropouts happen because of hostile school environments. Many students are pushed out of school by harsh school environments and practices (Glennie et al., 2012). Some high schools have particular practices and policies that discourage or demotivate students. The unwelcoming practices, such as certain disciplinary policies and accountability systems, diminish students' inclusion and belonging (Bakken & Kortering, 1999; Blackorby et al., 1991; Heissel, 2019; Nittle, 2019; Peguero et al., 2018). Some high schools require students who score low grades, have attendance problems, or behavior that is not consistent with the student body to face long-term consequences such as suspensions and referrals to alternative programs (e.g., special education or placement in isolated classes). These measures often see students withdraw involuntarily from school (Glennie et al., 2021).

Making learning institutions friendly to all learners is needed to empower all students with the knowledge and skills required to compete for opportunities and productively participate in a neo-liberalized globalized economy (Glennie et al., 2012; Nittle, 2019). High school education must be made valuable to learners to motivate them. Suitable learning environments must be promoted to eliminate sexual harassment, predation, and teenage pregnancies that cause high dropout rates for young girls. Hence, this contributes to the stigma, prejudices, and biases that prevent girls and women from pursuing science, technology, engineering, and mathematics (STEM) fields and careers or administration roles. Having role models for children and youth from marginalized communities (e.g., girls, African Americans, native people, or people with disabilities) is critical in taming demotivating factors that contribute to high school dropouts in high schools (Doll et al., 2013; Dunn et al., 2004; Lee-St. John et al., 2018; Masterson, 2021; Nittle, 2019; Plasman & Gottfried, 2018).

4. Adaptation of Inclusive Practices

There is a demand for adapting inclusive practices to meet students' needs. Educators should be at the forefront in advancing the inclusion of children, particularly from disadvantaged communities, by offering various resources and supports (e.g., access to resources such as counseling). The school community, teachers, and staff, in particular, must support the implementation of laws and policies that prohibit discrimination against vulnerable populations, for example, girls or those with disabilities or from minority groups (e.g., LGBTQ+) (Bakken & Kortering, 1999). Learning opportunities should be tailored to individual child's abilities and needs to help them belong in schools. As Bakken and Kortering mention, "the profession's intent of creating an individualized education tailored to meet the needs of individual students must extend to the issue of school completion" (1999a, p. 365). Therefore, educators must develop a plan that focuses on dropout prevention and maximizes the inclusion of students, especially those with special needs (Kortering & Braziel, 1999a; Nittle, 2019). Minimizing dropout percentages of vulnerable students, including children with disabilities, is possible when educators implement education plans such as individualized education plans (IEP) and the 504 plans to ensure students at risk receive appropriate support before, during, and after joining school (Bakken & Kortering, 1999; Bear et al., 2006). Besides, teachers can model, practice, and reinforce expected behavioral and social skills to implement school-wide positive behavioral interventions and supports to tame challenging or inconsistent behaviors (Pyle & Wexler, 2011; Sugai et al., 2009).

5. Transformation of Educators

Many students drop out of school because of poor teacher attitude, teacher incompetency, and educators' usage of learning materials (e.g., tests) to punish learners (Lee-St. John et al., 2018). Novice or poorly trained teachers make learning content difficult and the classroom hostile to learners, especially from minority groups (e.g., African Americans and students with disabilities) (Bear et al., 2006; Blackorby et al., 1991; Kortering & Braziel, 1999ab; McFarland et al., 2019). They use assignments to create an unfavorable environment for students. Unsuitable teachers turn an otherwise thrilling class into one in which students experience frustration. Some educators implicitly or explicitly engage in mental warfare with students, thus pushing them into emotional instability that makes their participation in learning activities and events complex. Such teachers make students feel deceived, and because of hurt, these students dropout out of school. These unmotivating teachers create a big social gap between them and students by not calling students by their names or discriminating against some students based on disability, gender, or other identities that are considered inferior. Students are made to feel as if they are nonexistent.

Some teachers find students irritating and directly or indirectly force them to drop their classes. Students who find teachers unfriendly soon lose interest in the class and, because of the poisoned learning environment, drop out of school to avoid being frustrated by biased teachers (Blackorby et al., 1991; Doren et al., 2014). Social barriers dampen students' spirits, and because of demotivation, these students drop out of school.

Therefore, there is a need for transformative educators capable of implementing best teaching practices informed by learners' needs, interests, and abilities (Sublett & Chang, 2019). School reform includes the transformation of educators. In particular, teachers need to gain knowledge in all realms, including face-to-face and online instruction. In particular, they need to gain experience in using the universal design of learning (UDL), social-emotional learning (SEL), and culturally relevant pedagogy (CRP) to support diverse learners. This would ensure they are experienced in delivering lessons that fit diverse learners' learning styles and, therefore, capable of addressing the learning needs of diverse learners (Sublett & Chang, 2019). Teachers must be instructors, *loco parentis*, coaches, and advocates for children and youth in their care (Kortering & Braziel, 1999b; Nittle, 2019; Peguero et al., 2018). High expectations of low-income students can improve the school atmosphere and reduce demotivating factors. Teachers must see all students, especially low-income families, through the asset-based perspective. Teachers should avoid sanctioning the belief that students from low-income families "aren't motivated" or "don't care" because they do not try to support them academically, emotionally, or socially. Falling susceptible to stereotypes and blaming impoverished people for being poor support the cycle of poverty.

Education programs must prepare teachers committed to the social justice and human rights of all learners and ensure that they are rewarded appropriately and proportional to their expertise and investment in the education of their students. Therefore, new incentives for teacher performance must encourage the recruitment of highly qualified teachers committed to advancing education for the betterment of education systems that value diverse students and prepare all for success in school and upon graduation.

6. Transformation of Stakeholders in Education

No individual, government, or entity can solely solve the education issues, let alone the school dropout problem. However, collaborating with various stakeholders is key to addressing ills in education, including school dropouts. It is the responsibility of everyone to control and address school dropouts. A collective approach is needed to make education accessible to all high school-age youth. Education is a human right. Therefore, communities, governments, and other entities must develop sound laws, policies, and practices that promote education for all (Blackorby et al., 1991; Doren et al., 2014; McMurrey, 2014; Pyle & Wexler, 2011). Laws and policies (e.g., the Elementary and Secondary Act of 1965,

Individuals with Disabilities Education Act 1997, No Child Left Behind Act 2001, and ESEA 2015) have worked differently in different states. Their impact has been varied, in some situations leading to problems that have exacerbated dropout of school-age children and youth and, in some cases, increased inclusion of learners with disabilities or from vulnerable groups (Bakken & Kortering, 1999; McMurrey, 2014; Plasman & Gottfried, 2018; Pyle & Wexler, 2011; U.S. Department of Education, 2017). Stakeholders in education must eliminate unnecessary waste of school resources, unwarranted punishments of students and families, molestation of students or bullying of students and teachers, and other school staff.

Families are indispensable in making the education system work for their children. Family school engagement ensures the provision of resources and services and promotes their child's discipline because they are the first teacher and role models (Nittle, 2019; Vázquez-Nava et al., 2019). Parents and guardians must be at the forefront of instilling discipline in their children at individual levels so they can understand the consequences of behaviors and the need to conform to school and community rules necessary for social harmony. Students must value education and adhere to principles and morals that lead to their wellbeing. Parents must accept responsibility and participate in school meetings and conferences. Parents also should be accountable for helping their children with homework and acquiring complex work culture, attitudes, and discipline necessary to love themselves, others, and one's country. In addition, disabled people and their families must engage in disability advocacy to create awareness in society and champion their rights (Blackorby et al., 1991; Doren et al., 2014).

Collaboration of various stakeholders such as educators, administrators, policymakers, and service providers such as social workers and professors is vital in providing resources and services critical to making schools accessible and friendly to all learners. In addition, collaborations and partnerships allow stakeholders to educate themselves about students, families, schools, the impact of various circumstances on teaching and learning, and the consequences on students' schooling. In particular, home-school partnerships and teacher-parent reciprocal relationships are vital in understanding the impact of norms and practices on students and informing, planning, and instituting appropriate measures that directly and positively affect students' inclusion and belonging (Moll et al., 1992). Unfortunately, power is often skewed in favor of teachers in the school setting. Instead of a one-sided approach, partnerships allow communication and the exchange of ideas that benefit all players.

Higher education institutions, especially teacher preparatory programs, must be at the forefront of producing highly qualified educators. Supporting educators in the acquisition of expertise and pedagogical practices are necessary for them to make schools welcoming to all students to realize their dreams.

There is a significant improvement in the education of children with special needs. Still, millions of children with disabilities do not have access to quality education, thus

predisposing them to failure in school through adulthood. Both the governments and private sectors must be instrumental in changing the deficit culture and dismantling barriers that hinder the population of disabled people from participating in schools and communities. Already, there are different organizations dedicated to addressing school dropouts in America. For example, the National Dropout Prevention Center (NDPCE) and the National Dropout Prevention Network (NDPN) provide resources and services, including information to those engaged in supporting vulnerable young people (https://dropoutprevention.org/who-we-are/our-mission/). NDPCE and NDPN work to improve opportunities for children and youth to fully develop their academic, social, work, and healthy life skills to graduate high school and lead productive lives. They do this by promoting awareness of successful programs and policies related to dropout prevention. Still, a lot remains to be done, so other organizations must collaborate in investing in the education sector. Therefore, all stakeholders must be involved in promoting education as a human right to ensure high schools and quality education are accessible to youth below the age of 24.

LIMITATIONS AND RECOMMENDATIONS

Dropout issues exist globally at all levels of schooling, yet this study focused on the USA high school context. Therefore, results may not represent the dropout trends in different schools and regions worldwide. Hence, a comparative study is needed to compare the drop-out trends globally. More studies are required to focus on high school dropout rates in America to identify the impact on learners and their families. Acquiring additional information on ways that threaten American society should also be addressed. A comparison study of high-income countries' high school dropout measures is also needed. Besides, more studies should compare high-income and low-income countries to understand the impact of out-of-school on communities and nations. Such knowledge may inform solutions in different regions.

CONCLUSION

School dropouts impede individuals and society by lowering their security. All stakeholders in education, including students, families, lawmakers, and educators, must implement education systems that work for everyone. Every citizen should be compelled to participate in making education accessible to all. The reformation of the education system and the transformation of individuals is essential in ensuring that all children and youth, especially vulnerable populations, access quality education. Hence, they will be career ready for the neo-liberalized globalized economic structure. Since dropping out of school is refuting education, there is a need to instill values in the education system that appreciates every citizen's talents, irrespective of their background. Therefore, communities and

governments should provide accessible material and supports for all children and youth to access, participate, and complete education and meet new goals to the best of their abilities.

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Research

Developing Students' Attitude Scale for the Online Education

Serkan Demirel [1]

Abstract:

While discussions on the efficiency and adequacy of distance education, which has passed through various stages from the 1700s to the present day, and its accessibility has become easier with the opportunities provided by technology, it has to be experienced by almost everyone after the pandemic in 2019. While there are various scale studies for distance education before 2019 in the literature, there is a need for an up-to-date scale with proven validity and reliability. Therefore, this study aimed to develop an up-to-date scale with proven validity and reliability for the use of researchers who aim to study this subject. The item pool of the scale was designed considering the attitude and its sub-components as positive and negative. The scale, which took its final form before the application with the help of an assessment and evaluation specialist and a language expert, was applied to a group of 341 students consisting of Gazi University Education Faculty, Hacı Bayram Veli University Fine Arts Faculty, Hacı Bayram Veli University Faculty of Literature. As a result of Exploratory Factor Analysis and Confirmatory Factor Analysis, a structure consisting of 30 items with six factors was revealed. Cronbach's alpha values of the factors were measured as 0.84, 0.71, 0.85, 0.70, 0.75, and 0.76, respectively. The total Cronbach's alpha value of the scale, which constituted the whole of the factors, was 0.92. As a result of the analyses performed at the end of this research, a valid and reliable scale was put forward to measure the attitudes toward online education.

Keywords: Keywords: Distance education, Online education, Scale development, Attitude.

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INTRODUCTION

Learning is the secret to success today (Davis & Davis, 2001). At the point where technology has come, new habits and new directions have emerged. Given that learning is considered crucial has gradually increased the importance attached to education, and learning has become more accessible with technology. As the expansion of the internet network in the world increased, the accessibility of information increased, so the speed of information transfer increased.

Education is the process of gaining desired behaviours from the individual (Ertürk, 1998). At this point where technology has come, the ways of adopting these behaviours for individuals have also diversified. While there are various positive and negative discussions about distance education continue (Alakoç, 2014; Horzum, 2014), health conditions that affected the whole world in 2019 resulted in compulsory education from a distance, albeit temporarily (Malta et al., 2022; Martínez-Hernández, 2022; Pinchbeck & Heaney, 2022; Tsiligkiris & Ilieva, 2022). Not to interrupt education, Turkey, as well as all over the world, started distance education by working on this issue (Council of Higher Education, 2020).

Although distance education experienced by students and educators is thought to be a new system, the origins of distance education go back to the 1700s (Harting & Erthal, 2005), and the term distance education was used officially in 1982 (Verduin & Clark, 1994). Distance education, carried out for a while with tools, such as letters (Kırık, 2014), continued until the radio station was established in the USA in 1919. In the late 1930s, distance education started to be delivered with television (Gümüşel & Dölen, 2022). At the latest point reached by information technologies, it has become more accessible today with distance education tools (Moore & Kearsley, 2005), which have turned into tools, such as computers, tablets and smartphones.

Distance education is a type of education in which students and teachers physically reside in different places while teaching using technology is used (Bruder, 1989). It has reached very different points with distance education technology, which was previously carried out from the post office. It reached its peak, albeit mandatory, especially during the pandemic in 2019 (Pregowska et al., 2021).

Given two different systems, distance education, synchronous and asynchronous, synchronous education is real-time (Gurung & Stone, 2020; Ogbonna et al., 2019), asynchronous training is known as training (Safavi, 2008) in which participants can participate asynchronously. A study suggests that asynchronous forms in distance education can be an effective tool to encourage student retention (Pinchbeck & Heaney, 2022).

There are also discussions about the effectiveness of distance education, especially after the situation brought about by the COVID-19 conditions, negative attitudes toward online education have emerged. For example, one study suggested that rapid adaptation to

distance education may be complex, especially in fields, such as medicine, computer science, and fine arts (Pregowska et al., 2021). However, a study claims that distance education benefits accessibility, affordability, flexibility, learning pedagogy, lifelong learning, and politics, and online pedagogy (Dhawan, 2020).

In a study investigating student opinions on online education during the COVID-19, thoughts, such as students' generally negative attitudes, ending distance education as soon as possible, and switching to traditional education before the pandemic came to the fore (Drašler et al., 2021).

Students' ideas about distance education were discussed in a study on attitudes toward distance education. In the said study, most students stated that they believed that distance education would never replace traditional education. Despite this, the same research revealed that distance education is helpful, its materials can be used at any time, and it is easy to return to the materials they have completed at any time to remember a topic (Karzhanova et al., 2021).

Before examining the related studies, it is useful to look at the definitions of attitude, which is an important concept of the research. Attitude is a psychological tendency expressed in favour or against an object to a certain degree (Eagly & Chaiken, 2007). Attitudes consist of three components: cognitive, affective and behavioural (Gable et al., 1993; Tavşancıl, 2014). Attitude has a dynamic effect on an individual's behaviour toward an object (Tavşancıl, 2014). In this context, a tool is needed to determine students' attitudes toward online education, which the whole world has experienced.

Because online education is not new, there are many studies on this subject. Kisanga and Ireson developed a tool to measure educators' attitudes toward online education with its subcomponents of Challenges of e-learning, Benefits from e-learning, Attitude to using computer systems, Leisure interest in e-learning innovations, and use of computers (Kisanga & Ireson, 2016). In the Turkish version of this scale, four factors were reconstructed: the tendency to use technology, satisfaction, motivation, and usefulness.

Ağır et al. (2007) developed a 6-factor structure consisting of 21 items to measure teachers' attitudes toward distance education. Another scale developed to measure teachers' online attitudes in Turkey revealed a 5-factor structure titled Technical Issues, Affective Attitude Toward Online Education, Cognitive Attitude Toward Online Education, Psychomotor Attitude of Online Education, Classroom Management (Demirel, 2022).

In addition, there are some tools developed to measure students' attitudes toward online education (Aixia & Wang, 2011; Arslan, 2021; Bayrak et al., 2020; Haznedar & Baran, 2012; Kışla, 2016; Wang, 2003; Yıldırım et al., 2014). Kışla (2016) revealed a one-factor structure with a participant group of 83 pre-service teachers. Yıldırım et al. (2014) found a 4-factor structure in the scale he developed, with the headings Personal Relevance, Effectiveness, Instructiveness, and Aptitude. The scale developed by Arslan (2021) consists of a 5-factor

structure with the subheadings of Satisfaction with the Facilities of the University in Distance Education, Attitude toward Faculty Members in Distance Education, Attitude toward Online Exams, Communication and Access in Distance Education, Comparison of Distance Education and Face-to-face Education. Wang (2003) developed a scale to measure students' attitudes toward online education with a 4-factor structure Learner Interface, Learning Community, and Content Personalization. Haznedar & Baran (2012) developed a 2-factor scale of e-learning susceptibility and e-learning avoidance to measure students' attitudes toward online education. Bayrak et al. (2020) developed a scale with participants consisting of students who took the online course in the fall and spring of 2017-2018 before the pandemic period. The scale in question includes a single-factor structure consisting of eight items. Aixia & Wang (2011) used an adapted 10-item scale for the research.

Purpose of this research

The attitude that enables people to evaluate certain assets positively or negatively (Eagly & Chaiken, 2007) can also provide a state of success in some jobs. For example, studies have revealed that attitude is associated with success (Güngör, 2021). Moreover, a study concluded that curiosities and concerns about e-learning affect student success (Etlioğlu & Tekin, 2020). For this reason, measuring attitude can be interpreted as revealing one of the building blocks of success. Measuring the attitude toward online education is also essential to examine students' views in an education system that emerged after the pandemic and to work to increase success by associating it with the factors affecting the students' success. Thus, the attitude scale toward online education is an essential tool.

Most of the scales for online education in the literature are developed under conditions before 2019. However, since the perception of online education before the pandemic is a type of education that not everyone has experienced, it is likely to be considered differently. The scale developed after COVID-19 by Arslan (2021), on the other hand, is an up-to-date example, mainly prepared with local items. Thus, there is a need for a scale that has been developed after the pandemic, has up-to-date items, has reliability and validity tests and structural equation model tests, and can have a global impact. In addition, with the development of a new scale regarding quality and quantity, options will be increased for researchers to use scales for online education. In this context, it is aimed to develop an up-to-date, global tool with structural validity and sufficient reliability coefficients to measure students' attitudes toward online education, which can meet all these needs in the present research. The attitude scale toward online education reflects students' thoughts on productivity, functionality, necessity, effectiveness, competence, and instructors can help make inferences when used in research. Hence, the research items were created with these components.

METHOD

Research Research Model

This study was conducted as a scale development study. The processes followed in this research and the characteristics of the study group are shown below. This study was conducted as a scale development study.

Participants

The study group of this research consisted of a student group of 341 students from Gazi University Education Faculty, Hacı Bayram Veli University Fine Arts Faculty, and Hacı Bayram Veli University Faculty of Literature. While determining the study group, the criterion of being a volunteer was considered. The scale development size complied with the five-fold rule of items (Child, 2006). One hundred seventy-seven students participating in the present research were first-year, 50 students were second-year, 55 students were fourth-year, and 59 students were fourth-year.

As of March 23, 2020, the Ministry of National Education of the Republic of Turkey structured its weekly course programs according to distance education. Education has begun to be provided using the Internet and TV (Ministry of National Education, 2020). On the subject of distance education related to higher education, the decision left to the universities in the past is that the Higher Education Institutions will switch to distance education with a decision on March 23, 2020 (Council of Higher Education, 2020). The application time of this research was conducted in May-June 2022. The research students have equally received online education for about two years since the COVID-19 pandemic began. First-year students received online education from the high school period, with at least one year at university, while other classes received online education during the university period. In addition, all participants had the opportunity to experience online education under the same conditions for at least one year. The student's answers in the research were also confirmed on this subject. For this reason, the participants received online training for an equal amount of time.

Developing the Scale and Collecting Data

The following steps were carried out to develop a measurement tool to measure students' attitudes toward online education.

Literature review

Firstly, research on online education was examined. In this research, the good and bad sides of online education, which has been known since the 1700s as a system that everyone is exposed to after COVID-19, were examined. In addition, attitude scales toward online education were also examined. It was observed that there were missing points in the scales. These deficiencies were re-determined by several factors, such as necessity.

Item Pool Phase

A pool was made of items containing the components of the attitude as cognitive, affective, and behavioral, including the deficiencies identified after the literature review. The items consisted of a 5-point Likert-type answer of strongly agree, agree, undecided, disagree, and strongly disagree.

Stage of content validity

To determine the content validity of a structure consisting of 38 items with six factors, assistance was received from a language expert and an assessment and evaluation expert. Conducting an audit accompanied by a language expert is one of the methods used to determine the sufficiency of the items in terms of quantity and quality (Büyüköztürk, 2007). The scale before the application was created by considering whether the questions were grammatical control with a language expert and whether the items were an attitude scale with an assessment and evaluation expert. At the end of the research, the structure consisting of "efficiency," "functionality," "necessity," "effectiveness," "competence," and "attitude toward trainers in online education" was re-evaluated by experts.

Pilot implementation

The scale, developed with experts, was first applied to a group of 30 people, and the student's understanding of the questions was evaluated. The implementation phase started because there were no problems with the prepared questions.

Implementation phase

In the implementation step, 341 responses were received. Step-by-step controls were made at every stage of the application.

Data Analysis

To determine the construct validity of the scale, exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) was performed. SPSS 25 package program was used for EFA, and AMOS 25 package program was used for CFA. It is appropriate to use the direct oblimin method for the scale consisting of related items (Crawford, 1975). Since the attitude scale also contained interrelated items, Kaiser-Mayer-Olkin (KMO) and Bartlett Sphericity tests and the direct oblimin method were used to test the suitability of the model. CFA was conducted to evaluate the fit of the model that emerged as a result of EFA. In analysis, Chi-square/ standard deviation ($\chi2$/sd), Root-Mean-Square Error of Approximation (RMSEA), Standardized Root Mean Square Residual (SRMR), Comparative Fit Index (CFI), Goodness of Fit Index (GFI), Adjusted Goodness of Fit Index (AGFI), Perioperative measurement of pharyngeal closing pressure (PCLOSE), and values were tested. Finally, the reliability of the scale based on internal consistency was examined with Cronbach's alpha test. In light of the findings, the scale took its final form with 30 items and six factors.

Ethical considerations

Quantitative data were collected electronically. Participants were informed that they would voluntarily participate in the present study and that they could quit or leave the study at any time.

Ethical approval was obrained from Gazi University Ethics Committee's decision numbered 2022/005 to conduct this study. In this study, all rules stated to be followed within the scope of the "Higher Education Institutions Scientific Research and Publication Ethics Directive" were followed. None of the actions stated under the title "Actions Against Scientific Research and Publication Ethics," which is the second part of the directive, were not taken.

Ethical review board name: Gazı University Ethics Committee

Date of ethics review decision: 09.03.2022

Ethics assessment document issue number: E-77082166-604.01.02-310170

RESULTS

In this part of this research, reliability, validity and structural data related to online education are included.

Results on Validity

The scale, which was applied to 350 people, reached a sufficient number within the development processes (Bryman & Cramer, 2001; Kass & Tinsley, 1979; Kline, 1994; Tavşancıl, 2014). "Kaiser Meyer Olkin (KMO)" and "Barlett Sphericity" values were calculated for the convenience of factor analysis of the data obtained before the EFA. The KMO value obtained in the study was 0.94. This number must be bigger than 0.60 to do factor analysis (Field, 2005; Pallant, 2001; Tabachnick & Fidell, 2006). The values found showed that the data were sufficient for factor analysis. As a result of the Bartlett sphericity test, the significant chi-square test statistics proved that the data showed a normal distribution. The results ($\chi2$ = 821,684, p=0.000) revealed that the research data showed a normal distribution.

Based on the results found before the EFA, it can be considered that the data obtained were suitable for factor analysis. Since it is appropriate to use the direct oblimin method in scales with related items (Crawford, 1975), direct oblimin was used as the rotation method in factor analysis.

In the scale consisting of 38 items, after removing eight items that did not meet the necessary conditions in the analysis results, a structure of 30 items and six factors emerged with EFA. This part of the research includes reliability, validity and structural data related to online education.

As a result of EFA, it was observed that the scale items were grouped under six factors with an Eigenvalue higher than 1 (Figure 1).
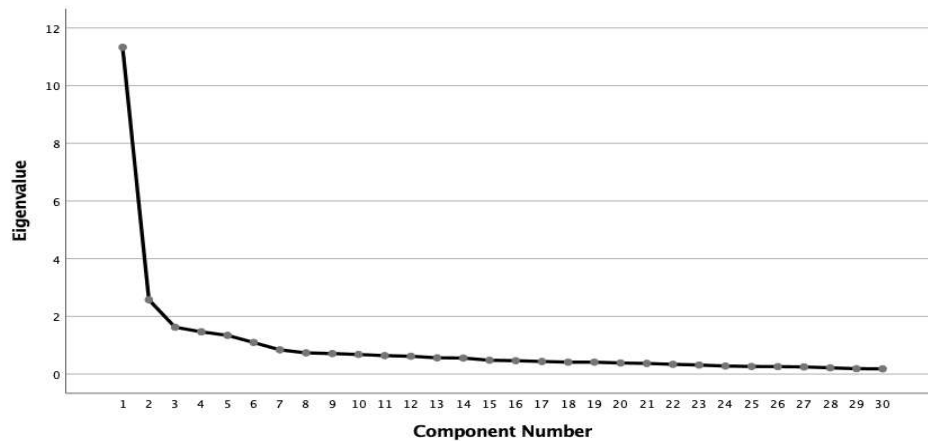
Figure 1. Scree plot

Six factors explained 64.76% of the total variance regarding the attitude variable. The factor loads of the factors that made up the scale ranged from 0.40 to 0.88. Items with a factor load of less than 0.30 and burdening more than one factor were removed. Table 1 shows the scale items, factors and factor loads.

Table 1

EFA Results of the Attitude Scale toward Online Education

	Componend	Common Factor Variance	Item-total correlation	Factor loading value	Eigenvalue	Explained variance
1. factor	VAR00007	.665	.554	.831	11.328	37.761
	VAR00005	.676	.625	.726		
	VAR00001	.676	.669	.717		
	VAR00008	.653	.584	.716		
	VAR00015	.686	.708	.656		
	VAR00002	.571	.593	.567		
	VAR00017	.582	.690	.515		
	VAR00009	.457	.583	.474		
2. factor	VAR00028	.698	.502	.776	2.578	8.592
	VAR00027	.698	.549	.759		
	VAR00024	.482	.507	.568		

	VAR00029	.531	.358	.528		
	VAR00033	.792	.604	-.863		
	VAR00034	.769	.611	-.833		
	VAR00036	.785	.665	-.800		
3. factor	VAR00035	.673	.558	-.774	1.623	5.411
	VAR00022	.643	-.575	.706		
	VAR00023	.526	.535	-.504		
	VAR00011	.664	.398	.776		
4. factor	VAR00012	.644	.479	.735	1.465	4.884
	VAR00014	.616	.503	.644		
	VAR00021	.736	.664	.771		
	VAR00019	.790	.756	.689		
	VAR00037	.703	.643	.679		
5. factor	VAR00038	.605	.534	.667	1.341	4.469
	VAR00020	.683	.701	.568		
	VAR00016	.573	.610	.458		
	VAR00026	.744	.282	.907		
6. factor	VAR00031	.622	.483	.680	1.095	3.649
	VAR00032	.487	.471	.509		

While developing the scale, the factor load should be at least 0.40 (Field, 2005). According to the results obtained, it was seen that this condition was met. As can be seen in Table 1, the factor load values of the first dimension consisting of eight items ranged from 0.47 to 0.81. The load values of the second factor consisting of four items were distributed between 0.52 and 0.77. The third-factor loading values, which consisted of six items, were distributed between 0.50 and 0.86. The fourth-factor load values consisting of three items varied between 0.64 and 0.77. The fifth-factor loading values, consisting of six items, ranged from 0.45 and 0.77. The sixth-factor load values, which consisted of three items, were distributed between 0.50 and 0.90. The lowest item load value of the six factors consisting of 30 items was 0.47, while the highest was 0.90. It was seen that six factors explained 63.1% of the total variance. The first factor explaining 37.761% of the total variance was

"productivity," the second factor explaining 8.59% of the total variance was "functionality," the third factor was "necessity," explaining 5.41% of the total variance, the fourth factor was "effectiveness" explaining 4.84% of the total variance," the fifth factor explaining 4.46% of the total variance was named as "competence," the sixth factor explaining 3.64% of the total variance was named as "attitude toward trainers in online education."

The construct validity of the model that emerged from the EFA analysis was evaluated by confirmatory factor analysis (CFA). EFA included χ2/df (Chi-Square/Degree of Freedom), RMSEA (Root Mean Square Error of Approximation), SRMR (Standardized Root Mean Square Residual), CFI (Comparative Fit Index), GFI (Goodness of Fit Index), AGFI (Adjusted Goodness of Fit Index), and PCLOSE tests were performed (Table 2).

Table 2

Compliance Values of the Six-factor Structure of the Attitude Scale toward Online Education

Criterion	Good fit	Acceptable	Value fit	Fit of the scale	Citation
(χ2/df)	≤ 3	4-5	2.140	Good fit	Byrne, 1989
RMSEA	≤ 0,05	0,06-0,08	0.058	Acceptable fit	Brown, 2006.
SRMR	≤ 0,05	0,06-0,08	0.061	Acceptable fit	Hu & Bentler, 1999.
CFI	≥ 0,96	0,90-95	0.92	Acceptable fit	McDonald & Marsh, 1990
GFI	≥ 0,90	0,89-0.85	0.85	Acceptable fit	Jöreskog & Sörborn, 1993
AGFI	≥ 0,90	0,89-0.80	0.82	Acceptable fit	Jöreskog & Sörborn, 1993
PCLOSE	≥ 0,05	0,01-0.05	0,09	Good fit	Hu & Bentler, 1999

According to CFA analysis data, χ2/sd and PCLOSE values had a good agreement. RMSEA, SRMR, CFI, GFI, and AGFI values in the structural equation model findings were among the acceptable ranges defined by the researchers, shown in the source part of Table 2. It was understood that the tested model showed sufficient fit criteria to be statistically compatible.

All path coefficients shown in the model were statistically significant at the p<0.00 level (Figure 2).

CMIN=821,684; DF=384; p=,000; CMIN/DF=2,140, RMSEA=,058; GFI=,857; CFI=,920
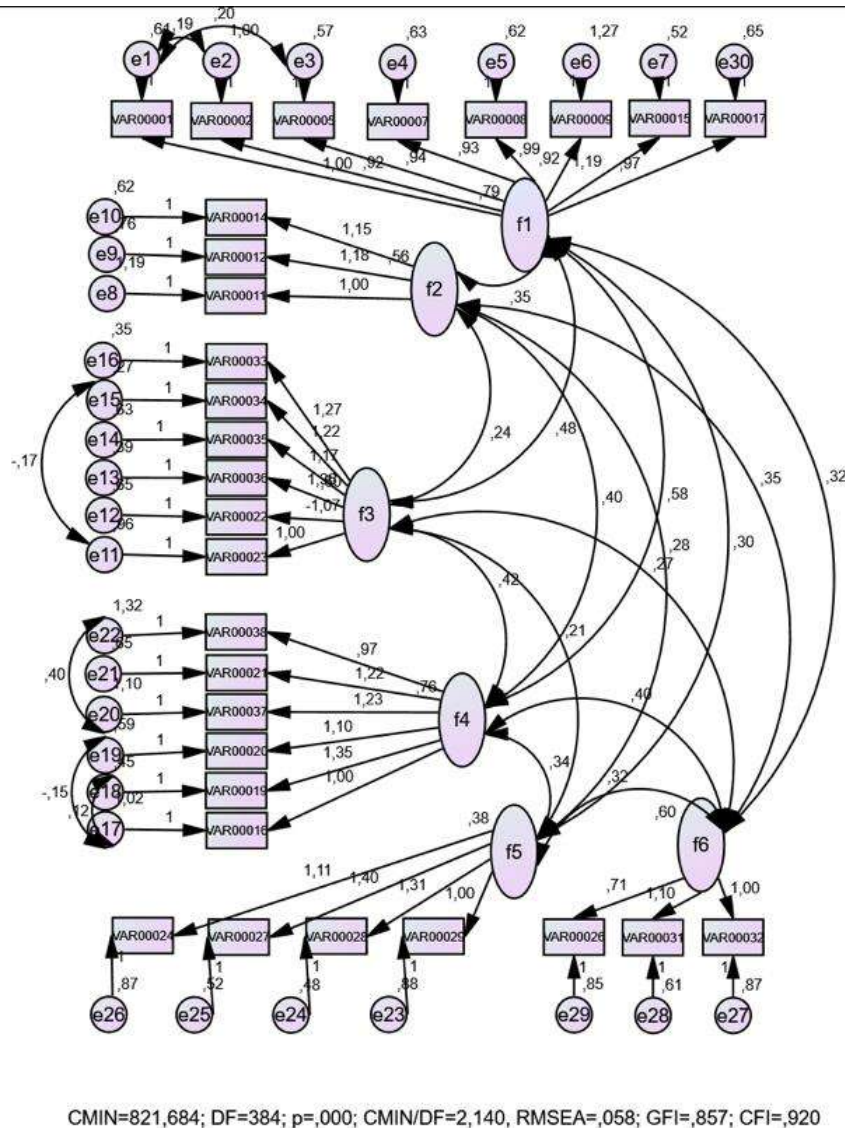
Figure 2. Confirmatory factor analysis results

Chi-square, Chi-square/degree of freedom and fit indices values of the model with CFA were χ2= 821.684 DF:384 P=0.000, RMSEA= 0.058. According to these data, the model has an acceptable fit (Brown, 2006).

Results on Reliability and Item Analysis

The reliability coefficients of the whole scale and its sub-dimensions are given in Table 3.

Table 3

Item-Total Correlation Values and Cronbach's Alpha Confidence Coefficients

	Item-Total Correlation	Cronbach's Alpha if Item Deleted	Factor Cronbach's alpha
VAR00001	.669	.924	.894

VAR00002	.593	.925	
VAR00005	.625	.925	
VAR00007	.554	.926	
VAR00008	.584	.925	
VAR00009	.583	.925	
VAR00011	.398	.928	
VAR00012	.479	.927	
VAR00014	.503	.926	
VAR00015	.708	.923	.711
VAR00016	.610	.925	
VAR00017	.690	.924	
VAR00019	.756	.923	
VAR00020	.701	.924	.857
VAR00021	.664	.924	
VAR00022	-.575	.938	
VAR00023	.535	.926	
VAR00024	.507	.926	
VAR00026	.282	.929	
VAR00027	.549	.926	.706
VAR00028	.502	.926	
VAR00029	.358	.928	
VAR00031	.483	.926	
VAR00032	.471	.927	
VAR00033	.604	.925	.750
VAR00034	.611	.925	
VAR00035	.558	.926	

VAR00036	.665	.924	
VAR00037	.643	.924	.766
VAR00038	.534	.926	
		Scale Cronbach's Alpha	.928

The overall Cronbach's alpha reliability coefficient of the scale was measured as 0.92. At the sub-dimensions level, it was determined as 0.89 for the first factor, 0.71 for the second, 0.85 for the third, 0.70 for the fourth, 0.75 for the fifth, and 0.76 for the sixth factor. Since the reliability coefficient above 0.70 is sufficient (Nunnally, 1978), it can be considered that all the reliability coefficients calculated are at an acceptable level. Therefore, it can be said that 30 items are sufficient for measurement, provided that the item-total test correlation is considered valid as above 0.30 (Nunnally & Bernstein, 1994).

CONCLUSION AND DISCUSSION

This research aimed to develop a tool that can be used to measure the attitude of university students toward online education. For this purpose, 341 students, consisting of Gazi University Education Faculty, Hacı Bayram Veli University Fine Arts Faculty, and Hacı Bayram Veli University Faculty of Letters students, participated in this research conducted to test reliability and validity levels and develop tools to be used. To develop an attitude scale toward online education, a 5-point Likert-type form consisting of 33 items was created with the help of an expert after scanning the subject. After the created form was applied to a trial group of 30 people, it was evaluated with content validity, and five items were added. It took its final form before the analysis was applied in a 38-item structure. After the exploratory factor analyses (EFA) of the scale were performed with the help of the SPSS package program, a structure consisting of 30 items revealed, explaining 63.1% of the total variance of six factors.

The 30-item final scale had a 6-factor structure with Exploratory Factor Analysis (EFA). According to the results of confirmatory factor analysis (CFA) performed to ensure the accuracy of the structure obtained, x2/sd was calculated as 2.14, RMSEA 0.058, SRMR 0.061, CFI 0.92, GFI 0.85, AGFI 0.82. It has been seen that the scale prepared according to the data obtained has acceptable and good fit values; therefore, it is structurally compatible.

Cronbach's alpha reliability coefficient values were tested in the reliability analyses of the scale. The reliability coefficient of the first factor of the scale was 0.89, the reliability coefficient of the second factor was 0.71, the reliability coefficient of the third factor was 0.85, the reliability coefficient of the fourth factor was 0.70, the reliability coefficient of the fifth factor was 0.75, and the reliability coefficient of the sixth factor was 0.76. In general, the total

reliability coefficient of all scale items was measured as 0.92. It can be said that the obtained values will reliably serve the purpose of all of the scale items.

The scale obtained in the present study has 19 positive and 11 negative items. Negative items were translated and analyzed in the statistical program. The factors that make up the scale are named "efficiency," "functionality," "necessity," "effectiveness," "competence," and "attitude toward trainers in online education."

The factors revealed in this research were designed to measure students' attitudes toward online education with different themes. For this reason, a multidimensional scale has emerged. Unlike this research, Bayrak et al. (2020) developed a single-factor scale of eight items before COVID-19. Aixia & Wang (2011) used an adapted 10-item scale for the research. Although the items used are for online education, a few items are thought to have a limited measurement capacity with only one factor.

Wang (2003) developed a scale to measure students' attitudes toward online education with a 4-factor structure Learner Interface, Learning Community, and Content Personalization. Kışla (2016) developed a single-factor scale, and the author suggests that it is appropriate for teacher candidates. Since these scales were made before the COVID-19, they differ slightly from the scale developed in the research. For example, the scale in this study also includes items related to COVID-19.

In this research, while the items were designed, only a specific local community was not targeted. The questions prepared in a more global sense and the scale developed by Arslan differ in this sense. Arslan (2021) has designed questions that aim to obtain answers relatively locally, consisting of the components of Satisfaction with the Facilities offered by the University in Distance Education, Attitude toward Faculty Members in Distance Education, Attitude toward Online Exams, Communication and Access in Distance Education, Comparison of Distance Education and Face-to-Face Education. For example, Arslan created a structure that questions the thoughts and attitudes of students studying at Sivas Cumhuriyet University with articles, such as "I believe our university does its best in the distance education process." Arslan has developed an updated scale after the pandemic. In this respect, it is a significant scale.

The present research was conducted with the students of the faculty of education, faculty of literature, and faculty of fine arts. The scale, in which Haznedar & Baran (2012) developed a 2-factor scale of e-learning susceptibility and e-learning avoidance, was developed with participants consisting of pre-pandemic education faculty students, and it was suggested to be repeated in different sections by the researcher. In the scale developed by Haznedar and Baran, positive items were classified with the theme of susceptibility, and negative items with the theme of avoidance.

The effectiveness factor, which is one of the factors revealed in the research, is also present in the scale developed by Yıldırım et al. (2014), albeit in different items. In this study, while the effectiveness factor was revealed with a 6-item structure, Yıldırım, Yıldırım, Çelik,

and Karaman created this component with a 5-item factor structure. Other factors are Personal Suitability, Effectiveness, and Instructional factors that differ from those designed for research.

The necessity factor is one of the most striking factors in the developed scale. Earlier scales did not have a necessity factor. Before COVID-19, online education was known to most people as just an option. COVID-19 resulted in the compulsory education of students online in March 2020. This incident revealed that online education might be necessary for some people. In addition, using this scale, it can be investigated whether the theoretical or applied courses are more suitable for the students to be given online, with the research to be conducted on the students studying in the departments with different weights of theoretical and applied courses.

At first glance, the focus of the items in the attitude factor toward instructors in online education seems to be only on the perception of difficulty. Looking at the items, it can be seen that this factor is not just the perception of difficulty. While designing the items, this factor aimed to measure whether the situation of teachers' changing perception toward online education for good or bad affects the students' attitude. Looking at the items in this factor; The item *"I believe that exams are difficult in online education"* has been prepared to measure hidden items, such as the situation of instructors preparing students for the exam in online education, the way they prepare the exam, and the student's readiness for these exams. In other words, this item can be interpreted as the perception of difficulty and the evaluation of students' self-efficacy through exams. *"I believe that instructors make it difficult for students for online education"* was prepared with the aim of sub-items, such as how much teachers help students in online education, the perception that they will help, and whether there is a concession situation against them. This item is the item that most includes the perception of difficulty in online education. Education is more than just a classroom. Education is learned even better by reinforcing the subject covered in the lesson. For example, the item *"I find it difficult to reach teachers outside the classroom in online education"* is about education in and out of school. In this article, there is the subject of how teacher-student relations change the perception toward online education. This item, prepared as a behavioral attitude, examines the perception of difficulty and how teacher-student relations contribute to the attitude toward online education.

As a result, the factor of attitude toward trainers in online education includes the following sub-attitudes: The effect of instructors' exam preparations on students' attitudes toward online education (cognitive), the effect of instructors' online exam preparations on students' self-efficacy (affective), whether instructors facilitate online learning for students (behavioral), the effect of teacher-student relationships on online attitude (behavioral). Besides these, the perception of difficulty is seen. Therefore, the "attitude factor toward instructors in online education" is more than the perception of difficulty. However, when researchers who want to use the scale do not want to use this factor, the eigenvalue is

61,117%. When the talking factor is added, a rate of 64,766% stands out. The presence of this factor in the study shows the diversity of the scale.

Although this scale developed in the present research was only made with undergraduate students, it is considered that it can be used for all students as well. Therefore, it is thought that the scale will effectively study the relationship between attitudes toward online education and other variables.

In light of the findings, the scale developed for students' attitudes toward online education has convenient features. For this reason, the use of the scale revealed in the research for online education at the level of university students may be appropriate for researchers. In addition, it is evaluated that this research can be used as a more effective tool than other scales if the scales developed for the attitude towards online education developed before the pandemic are developed with students who need more experience in this subject. Finally, it was an advantage for the research that all study groups participating in the research had experienced and participated, because it was compulsory.

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Students' Attitude Scale for The Online Education

	efficiency
1	I use my spare time more actively thanks to online education
2	For me, it is difficult to use time effectively in online education.
3	Thanks to online education, there is time for my other works in the time left after the lesson.
4	I believe that repeating the course in online education reinforces learning.
5	The privilege of being able to take the course I want, whenever I want, and wherever I want in online education makes me feel good.
6	9. I think "my own internet speed" is sufficient for online education
7	15. I believe that the absence of time and place limits in online education increases the efficiency of the lesson.
8	17. Resources used in online education increase the efficiency of the course
	functionality
9	I think the technical capacity of my "own devices" (computer, tablet, phone, etc.) that I use for online education is insufficient.
10	I think there is an audio and video synchronization problem in online education.
11	I think the interface I use in online education (the program on the educational device) is insufficient.
	necessity
12	I think that online education is a necessity in terms of health.
13	I feel safe in terms of health in online education
14	I believe online education reduces the spread of disease
15	During illnesses such as a pandemic, I prefer to conduct classes online.
16	I think that online education is a necessity in pandemic diseases such as covid.
17	Even if there is a pandemic, I think that online education should not be done.
	effectivenes
18	I believe that the exams in online education will not cause any technical problems (such as connection problems).
19	A student who graduates from online education will be at least as competent as those who graduate from face-to-face education.
20	I think the student cannot receive the course gains in the online course only.
21	I think that the online education system cannot replace face-to-face education.
22	If I had the authority, I would transfer the theoretical lessons to the online system even after the pandemic.
23	I think that one day, all training will switch to online training.
	competence
24	I believe that the competence of the online education system in our country is in a good position among other countries.
25	I think that the trainers are sufficient for online education
26	Instructors come with adequate preparation for online training
27	I think the trainers I train online should improve themselves a little more in this regard.
	attitude towards trainers in online education
28	I believe that exams in online education are difficult.
29	I believe that instructors make it difficult for students to learn online.
30	I find it difficult to reach teachers in online education outside of the classroom.

Online Eğitime Yönelik Öğrenci Tutum Ölçeği

	verimlilik	
1	Online eğitim sayesinde dersten arta kalan zamanımı daha aktif kullanırım	
2	Bana göre online eğitimde zamanı etkili kullanmak zordur	
3	Online eğitim sayesinde dersten arta kalan zamanlarda diğer işlerime zaman kalır	
4	Online eğitimde, ders tekrarı yapabilme konusunun öğrenmeyi pekiştirdiğine inanırım.	
5	Online eğitimde istediğim zaman, istediğim yerde, istediğim derse girebilme ayrıcalığı beni iyi hissettirir	
6	Online eğitim için "kendi internet hızımın" yeterli olduğunu düşünürüm	
7	Online eğitimde zaman ve mekân sınırının olmamasının ders verimliliğini artırdığına inanırım.	
8	Online eğitimde kullanılan kaynaklar dersin verimini artırır	
	işlevsellik	
9	Online eğitim için kullandığım "kendi cihazlarımın" (bilgisayar, tablet, telefon vs) teknik kapasitesinin yetersiz olduğunu düşünürüm	
10	Online eğitimde ses ve görüntü senkronizasyon sorunu olduğunu düşünürüm	
11	Online eğitimdeki kullandığım arayüzün (eğitim için kullanılan cihazdaki programın) yetersiz olduğunu düşünürüm	
	gereklilik	
12	Sağlık açısından online eğitimin gereklilik olduğunu düşünürüm	
13	Online eğitimde sağlık açısından kendimi güvende hissederim	
14	Online eğitimin hastalık yayılmasını düşürdüğüne inanırım	
15	Pandemi gibi Hastalık dönemlerinde, derslerin online yapılmasını tercih ederim	
16	Covid gibi pandemi hastalıklarında online eğitimin bir gereklilik olduğunu düşünürüm	
17	Pandemi olsa bile online eğitimin yapılmaması gerektiğini düşünürüm	
	etkililik	
18	Online eğitimde yapılan sınavların teknik olarak (bağlantı sorunu gibi) bir sorun çıkarmayacağına inanırım.	
19	Online eğitimden mezun olan bir öğrencinin en az yüz yüze eğitimden mezun olan bir öğrenci kadar yetkin olacağını düşünürüm	
20	Sadece online olarak alınan derste, öğrencinin ders kazanımını alamayacağını düşünürüm	
21	Online eğitim sisteminin yüz yüze eğitimin yerini tutamayacağını düşünürüm	
22	Yetkim olsa, pandemi sonrası bile teorik dersleri online sisteme aktarırım	
23	Bir gün bütün eğitimlerin online eğitime geçeceğini düşünürüm	
	yeterlik	
24	Ülkemizdeki online eğitim sistemi yeterliğinin, diğer ülkeler arasında iyi konumda olduğuna inanırım	
25	Eğitmenlerin online eğitim için yeterli olduğunu düşünürüm	
26	Eğitmenler online eğitime yeteri kadar hazırlık yaparak gelir	
27	Online eğitim aldığım eğitmenlerin bu konuda kendini biraz daha geliştirmesi gerektiğini düşünürüm	
	eğitmenlere yönelik tutum	
28	Online eğitimdeki sınavların zor olduğuna inanırım	
29	Eğitmenlerin online eğitim için öğrencilerin işini zorlaştırdığına inanırım	
30	Online eğitimdeki öğretmenlere ders dışında ulaşmakta zorlanırım	

An Investigation of Social Acceptance Levels of Students with Typical Development toward Their Peers with Special Needs in terms of Certain Variables

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Abstract:

The aim of this study is to investigate the level of social acceptance of students with typical development in inclusive classes towards individuals with special needs in terms of certain variables. In this study, the screening model was used, which is one of the quantitative research methods. The reason for choosing the screening model in the research is to determine the relationship between different variables such as gender, parents' education level, and whether there is a person with disability in the student's immediate environment and the level of social acceptance. In the 2019-2020 academic year, 1083 6th, 7th, and 8th-grade students in inclusive classes in public secondary schools in Türkiye participated in the study. The Social Acceptance Scale was used in the study. The statistical package was used to analyze the data. The results of the study revealed that there was a significant difference in social acceptance levels of students with typical development towards their peers with special needs ($p < 0.001$) according to the variables as gender, father's education level, grade level, Having a person with disability among relatives, previous attendance to kindergarten and nursery in the past, family status. However, it was found out that there was no statistically significant difference between the mother's level of education of the students with typical development and their social acceptance levels towards their peers with special needs.

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INTRODUCTION

Inclusive education is defined as the education practice based on the principle that individuals with special education needs have the right to receive the same education with their peers, by providing support education services to individuals with special education needs to ensure that they interact with other individuals of all types and levels and achieve their educational goals at the highest level (Turkish Ministry of National Education, 2018) In Türkiye, the least restrictive educational environment is supported by the changing school policies and laws recently, and people with special needs benefit from the same educational environment as their peers, in other words, their participation in inclusive practices is guaranteed (Özkan-Yaşaran, 2009; Nal and Tüzün, 2022; Karaca, 2018). The most important factor for the successful implementation of inclusive practices is the team that will implement the inclusion. Inclusion students and their peers are among the people who participate in the team that will carry out the inclusion practices (Batu and Kırcaali-İftar, 2006; Graham, 2020)

Some of the main goals of inclusion are: Individuals with special needs interact with peers, have positive attitudes toward themselves, and are socially accepted by their peers (Krahe and Altwasser, 2006; Batu, 2008). One of the expected benefits of inclusive education is that students with special needs learn to live with their peers with typical development In inclusive education, students with special needs learn skills by observing students with typical development. In this way, they acquire life experiences that prepare them for life in society. In addition, students with typical development can obtain realistic information about people with special needs, acquire skills to live with individuals different from themselves, and develop positive attitudes toward them (Sucuoğlu and Kargın, 2006). However, students with special needs may differ significantly from their peers with typical development in terms of their cognitive, physical, and adaptive skills and abilities. These differences can sometimes affect the level of interaction between students with special needs and students with typical development. In order for individuals with special needs to develop these skills, they must be taught together with their peers with typical development (Fırat and Koyuncu, 2019). It is not considered sufficient for students to be physically in the same environment to ensure the social integration of students with typical development and students with special needs. The need for increased social interaction is emphasized (Kargın and Baydık, 2002). In order for this interaction to occur, students with typical development are found to be associated with the social acceptance of students with special needs (Fırat and Koyuncu 2019; Watson and Keith 2002; Hogan, McLellan, and Bauman, 2000).

Social acceptance is thought of as playing games or spending time with students being accepted by peers or being accepted as a member of the class (Chan and Mpofu, 2001; Odom et al., 2006). Considering the basic characteristics of children that affect social acceptance, developmental disabilities are among the important factors that affect social acceptance (Guralnick, 2002; Odom and Diamond, 1998; Avcıoğlu, 2017; Odom et al., 2006). The level

of social acceptance of students with special needs is among the topics of interest. This is because understanding the level of social acceptance of students who show typical development in inclusive classrooms versus students with special needs is considered important for teaching various concepts and information to the groups of children with whom experts work in inclusive programs (Şahin and Çiçek, 2008). The social acceptance of children with special needs increases when they are taught in the same environment as their peers. In practice, children with special needs have not been accepted or rejected by their peers without the necessary support. Many people have difficulty in communicating with individuals with special needs because they do not have enough information about them. Individuals with special needs are not accepted by their peers because of their disabilities, because they do not know what impact the disability has on daily life, or because they have negative attitudes (Aktaş, 2001).

The first social institution that both individuals with special needs and individuals with typical development encounter after the family is a school. The reason parents send their children with special needs to the same environments as students with typical development is the limited and inadequate social opportunities in special education institutions (Scheepstra, Nakken and Pijl, 1999). Parents expect their children with special needs to be socially accepted by their peers (Watson and Keith 2002; Hogan, McLellan and Bauman, 2000). This is because research emphasizes that acceptance of children with special needs in inclusive environments, in other words, ensuring social acceptance of children with typical development, is an important element for inclusive education and providing social acceptance for teachers, parents, and students is extremely important (Uysal, 2004).

When students develop positive relationships with peers in the school environment, when they are sought out and desired as friends by their peers, when they are recognized and accepted by their peers, this contributes to them seeing themselves as competent and valuable individuals and being socially accepted. The opposite situation can cause the child to feel inadequate, worthless, and lose self-confidence (Bishop and Inderbitzen, 1995). Thus, the fact that individuals with special needs are not socially accepted by their peers causes their already low self-esteem to drop even further and they experience feelings of inadequacy due to negative self-perceptions. In addition, individuals with special needs who are not socially accepted may exhibit problematic behavior and avoid social relationships (Civelek, 1990).

The social acceptance of students with special needs by their peers may vary depending on the quality of their relationships with them. The characteristics of children with special needs also influence the quality of their relationships with peers. According to the related studies, the social skills, interactions, and language skills of children with special needs may be lower compared to their peers, and they may exhibit more problem behavior (Siperstein and Bak, 1985; Guralnick et al., 2006), and these characteristics are considered among the common traits of children who are excluded from their peers (Kargın and

Baydık, 2002). In particular, the low self-esteem of individuals with special needs may cause them to behave negatively and engage in problematic behavior that their peers expect from them, and which may negatively affect the psychological state of individuals with special needs by preventing them from developing themselves (Kaner, 2000; Aktaş and Küçüker, 2002).

Sucuoğlu and Kargın (2006) talk about two basic factors that affect social acceptance. The first factor is the characteristics of the individual with special needs and their differences from their peers, and the second factor is the attitude and level of social acceptance of teachers and peers towards the individual with special needs. Additionally, in the inclusion practices of students with special needs, the variables that affect the social relationships with peers who has a typical development were also addressed. These variables include peer attitudes, type of disability, degree of disability, gender, age, and educational level (Nal and Tüzün, 2011; Sünbül and Sargın, 2002; Civelek, 1990). Although there are many studies in Türkiye that examine the opinions and attitudes of peers towards individuals with special needs (Aral and Dikici, 1998; Ercan, 2001; Turhan, 2007; Çiftçi, 1997), in the secondary school period which is considered as a breaking point (Steinberg and Morris, 2001) limited studies have been conducted on the social acceptance of students with special needs by their peers who show typical development (Chamberlain, Kasari and Rotheram-Fuller, 2007).

The social acceptance levels of individuals with typical development towards their peers with special needs is important for the success of inclusive education practices. At the secondary school level, where attitudes are still being shaped, students' social acceptance levels towards individuals with special needs need to be determined. For this reason, it is important to carry out further studies to determine the social acceptance of individuals with typical development towards individuals with special needs. This study is expected to contribute to the literature from a different perspective by addressing various variables of social acceptance levels of students with typical development towards their peers with special needs. This study is important in terms of contributing to the literature with the data provided on social acceptance. Quantitative studies conducted with large samples are insufficient in the literature on the social acceptance of students with typical development towards individuals with special needs in Türkiye. In this respect, this study has higher representativeness by reaching 1083 students studying in many schools in Konya, Türkiye.

Similarly, when the studies conducted to examine the social acceptance levels in Türkiye are examined systematically, they are conducted especially on primary school students (Şahbaz, 2007; Aktan, Budak, and Botabekovna, 2019). This study fills an important research gap in Türkiye by researching the social acceptance levels of the students with special needs at the secondary school level including inclusive education students toward their peers with special needs.

In order to integrate individuals with special needs into society, various research and studies should be conducted on the social acceptance of them by children with typical

development, especially in the educational process (Peters, 2004; Chamberlain, Kasari and Rotheram-Fuller, 2007). This study is important in terms of understanding the social acceptance of students with typical development towards individuals with special needs in Türkiye.

Purpose of the study

The purpose of this study is to investigate the level of social acceptance of students with typical development in inclusive secondary school classes toward individuals with special needs in relation to certain variables. In this study, the answers to the following questions were sought.

1) Is there a significant difference between the gender of students with typical development and the level of social acceptance toward students with special needs?

2) Is there a significant difference between the educational level of mothers of students with typical development and the level of social acceptance toward students with special needs?

3) Is there a significant difference between the educational level of the fathers of students with typical development and the level of social acceptance toward students with special needs?

4) Is there a significant difference between the grade levels of students with typical development and the level of social acceptance toward students with special needs?

5) Is there a significant difference between the presence of a student with special needs in the family of students with typical development and the level of social acceptance toward students with special needs?

6) Is there a significant difference between the past attendance to kindergarten and level of social acceptance toward students with special needs?

7) Is there a significant difference between the past attendance to nursery and level of social acceptance toward students with special needs?

8) Is there a significant difference between the nuclear and extended family status of students with typical development and the level of their social acceptance toward students with special needs?

METHOD

Research Design

Quantitative research method was used in this study. The main purpose of the quantitative research method is to obtain the most objective, unbiased information that explains the cause-effect relationship and can be generalized to the population (Gali, Borg,

and Gali, 1996). In this study, the relational screening model was used. In studies using relational screening, the positive or negative relationship between two or more variables is revealed and the effect of one variable on the other is examined. The quantitative data obtained in relational studies are screened for relationships that are in the same or opposite directions, and the strong or weak relationships with each other (Erefe, 2012). In this way, relational screening models enable to understand the amount of change between two or more variables (Karasar, 2006). Therefore, in this study, the findings of the relationship in terms of various variables between the levels of social acceptance of students with special needs by their peers in their classes in secondary schools are expressed with numerical data.

Participants

The current study was conducted with the participation of 1083 students who were attending in inclusive education classes in public secondary schools in Konya, Türkiye in the 2019-2020 academic year. Before starting the research, permission was obtained from the Directorate of National Education in Konya. In the research, 6 general education secondary schools with inclusive students were determined. It has been stated that participation in the research is entirely on voluntary basis and that information about the participants will not be shared in any way. The demographic information of the participants is given in the table below.

Table 1
Demographic information of the participants

| | | Gender | | | | | |
| | | Male | | Female | | Total | |
		N	%	N	%	N	%
Grade	6	175	46.1%	205	53.9%	380	100%
	7	165	43.3%	216	56.7%	381	100%
	8	122	37.9%	200	62.1%	322	100%
	Total	462	42.6%	621	57.3%	1083	100%

It can be seen in Table 1 that 175 of the 380 students in the 6th-grade are males while 205 of them are females. Similarly, among the 381 students in the 7th-grade, 165 of them were males and 216 of them were females. Of the 322 8th-grade students, 122 were males and 200 were females. A total of 1083 students participated in the study.

Instruments

Along with the "Social Acceptance Scale", the background information form which was developed by the researchers was used to determine the social acceptance levels of students with typical development toward students with special needs in the inclusion classes. The social acceptance scale developed by Arslan (2010) is a 32-item 3-point Likert scale. As a result of the exploratory factor analysis conducted to ensure the construct validity of the scale, a three-factor structure was determined. The first factor was named as "Social

Skills", the second as "Student Behavior" and the third as "Peer Attitude". The percentage of explaining the total variance of the three-factor structure is 46.66%. As a result of the reliability analysis, the internal consistency coefficient of 32 items was found to be .93, and the Spearman Brown Two Half Test correlation was found to be .96. In the reliability analysis performed on the data of this study, the Cronbach Alpha Internal Consistency Coefficient was found to be .92.

Data collection process and analysis

Data were collected from 6 general education secondary schools in Konya, Türkiye. Data collection tools were distributed in the classroom environment to typically developing students who are attending inclusive classes at their school. The students who participated in the research were informed about the data collection tools. Data collection tools were distributed to students who volunteered to participate in the study. The average coding time of the data collection tool is 15 minutes. After coding, measurement tools were collected by the researchers. The data were collected in February of the 2019-2020 academic year.

The analysis of the data was conducted with the help of the statistical package program. The independent samples t-test was used to understand whether there exists a difference based on the gender of the students with typical development, Having a person with disability among relatives, their previous attendance to nursery, their previous attendance to kindergarten, and their family status. One-way analysis of variance (ANOVA) was used to understand the difference between the grade levels, father education levels, and mother education levels of students with typical development. In cases where a difference was found, Tukey test was used to control the difference between the mean scores to find the reason for the difference.

FINDINGS

The findings regarding the gender of the students, their grade level, having a person with disability among relatives, their previous attendance to nursery, their previous attendance to kindergarten, the education level of the parents, and the relationship between family status and social acceptance levels are included in this section.

Table 2

Independent samples t-test results on the relationship between social acceptance level and gender

	Gender	N	$\overline{\text{X}}$	Sd	t	p
Peer attitudes	Male	462	17.14	3.85	-7,115	**,000**
	Female	622	18.73	3.44		
Student behavior	Male	462	22.16	4.03	-5,483	**,000**
	Female	622	23.39	3.32		
Social skills	Male	462	35.91	7.22	-5,083	**,000**
	Female	622	38.05	6.57		

p<0.001

When Table 2 is examined, it can be seen that the social skills, student behavior and peer attitudes, which are sub-dimensions of social acceptance level, were compared to the gender of the students. Regarding the mean scores in Table 2, in the peer attitudes dimension, it was determined that males had $\overline{X}$ = 17.14 and females had $\overline{X}$ = 18.73 points. In student behavior dimension, males had $\overline{X}$ = 22.16 and females had $\overline{X}$ = 23.39 points. Finally, in the social skills dimension, males had $\overline{X}$ = 35.91 and females had $\overline{X}$ = 38.05 points. The relationship between the genders of students with typical development in inclusion classes and their social acceptance levels toward individuals with special needs was investigated. There was a significant difference (p<0.001) in favor of female students in the sub-dimensions of peer attitudes, student behavior, and social skills.

Table 3

The findings of one way -ANOVA test regarding the relationship between mothers' level of education and social acceptance levels of the students

		N	$\overline{X}$	Sd	F	p
Peer attitudes	Primary school	344	18.42	3.18	2,118	,077
	Secondary school	261	17.90	3.97		
	High school	251	18.07	3.75		
	University	153	18.10	3.66		
	Postgraduate	39	16.76	5.15		
	Total	1048	18.10	3.69		
Student behavior	Primary school	344	23.18	3.34	,791	,531
	Secondary school	261	22.78	3.78		
	High school	251	22.75	3.89		
	University	153	22.97	3.44		
	Postgraduate	39	22.49	4.71		
	Total	1048	22.92	3.66		
Social skills	Primary school	344	37.63	6.94	1,894	,109
	Secondary school	261	37.43	7.04		
	High school	251	36.64	6.90		
	University	153	36.11	6.51		
	Postgraduate	39	38.07	7.28		
	Total	1048	37.14	6.92		

p<0.05

When Table 3 is examined, the relationship between the education levels of mothers of students with typical development and their social acceptance levels toward individuals with special needs can be seen. The mean scores of the mothers in the dimension of peer attitudes, which is one of the sub-dimensions of the level of social acceptance are as follows: primary school graduates $\overline{X}$ = 18.42, secondary school graduates $\overline{X}$ = 17.90, high school

graduates $\overline{X}$ = 18.07, university graduates $\overline{X}$ = 18.10, and graduates of postgraduate education $\overline{X}$ = 16.76. The mean scores of mothers in the social acceptance level's student behavior sub-dimension are as follows: primary school graduates $\overline{X}$ = 23.18, secondary school graduates $\overline{X}$ = 22.78, high school graduates $\overline{X}$ = 22.75, university graduates $\overline{X}$ = 22.97, graduates of postgraduate education $\overline{X}$ = 22.49. In the social skills sub-dimension, the means scores of the mothers were found as follows: primary school graduates $\overline{X}$ = 37.63, secondary school graduates $\overline{X}$ = 37.43, high school graduates $\overline{X}$ = 36.64, university graduates $\overline{X}$ = 36.11, graduates of postgraduate education $\overline{X}$ = 38.07. There was no significant difference between the sub-dimensions of social acceptance level, peer attitudes, student behavior and social skill levels, according to the education levels of the mothers of the students with typical development (p>0.05).

Table 4

The findings of one way -ANOVA test regarding the relationship between fathers' level of education and social acceptance levels of the students

		N	$\overline{X}$	Sd	F	p	Significant Difference
Peer attitudes	Primary school	154	18.20	3.48	1,249	,288	
	Secondary school	235	18.13	3.64			
	High school	303	18.26	3,51			
	University	259	18.14	3.85			
	Postgraduate	92	17.31	4.12			
	Total	1043	18.11	3.68			
Student Behavior	Primary school	154	23.34	3.28	2,802	**,025**	2-3 (in favor of 2)
	Secondary school	235	22.37	3.94			
	High school	303	23.28	3.39			
	University	259	22.72	3.89			
	Postgraduate	92	22.75	3.75			
	Total	1043	22.90	3.67			
Social skills	Primary school	154	38.27	7.03	3.65	**,006**	1-5 (in favor of 1)
	Secondary school	235	36.60	7.27			3-5 (3 in favor)
	High school	303	37.81	6.38			
	University	259	36.75	6.86			
	Postgraduate	92	35.47	7.59			
	Total	1043	37.13	6.95			

p<0.05

When Table 4 is examined, the relationship between the education levels of the fathers of the students with typical development and the social acceptance levels of the students toward individuals with special needs can be seen. The mean scores of fathers in the dimension of peer attitudes, which is one of the sub-dimensions of social acceptance are as follows: primary school graduates $\overline{X}$ =18.20, secondary school graduates $\overline{X}$ = 18.13, high school graduates $\overline{X}$ = 18.26, university graduates $\overline{X}$ = 18.14, and graduates of postgraduate education $\overline{X}$ = 17.31. The mean scores of fathers in the social acceptance level's student behavior sub-dimension are as follows; primary school graduates $\overline{X}$ = 23.34, secondary school graduates $\overline{X}$ = 22.37, high school graduates $\overline{X}$ = 23.28, university graduates $\overline{X}$ = 22.72, and graduates of postgraduate education $\overline{X}$ = 22.75. In the social skills sub-dimension, the mean scores of the fathers are as follows: primary school graduates $\overline{X}$ = 38.27, secondary school graduates $\overline{X}$ = 36.60, high school graduates $\overline{X}$ = 37.81, university graduates $\overline{X}$ = 36.75, and graduates of postgraduate education $\overline{X}$ = 35.47. No statistically significant difference between peer attitudes sub-dimensions of social acceptance level and father's education levels was found (p>0.05), but there is a significant difference between student behavior and father's education levels (p<0.05), the result of the Tukey test which is one of the Post Hoc tests shows that the difference is between the fathers who are graduates of secondary school and those who are graduates of high school in favor of fathers who are secondary school graduates. It was seen that there was a significant difference between social skill level and father's education level (p<0.05), and it was between primary school and university graduates and the direction of the difference was in favor of primary school graduates. Similarly, there was a significant difference between high school graduates and graduates of postgraduate education, and it was in favor of high school graduates.

Table 5
The findings of one way-ANOVA test regarding the relationship between the social acceptance levels of the students and their grade levels

		N	$\overline{X}$	Sd	F	p	Significant Difference
Peer attitudes	6	380	17.47	4.11	7,735	**,000**	6-7; 7 in favor
	7	381	18.48	3.36			6-8; 8 in favor
	8	322	18.24	3,51			
	Total	1083	18.05	3.71			
Student behavior	6	380	22.13	4.02	15,054	**,000**	6-7; 7 in favor
	7	381	22.94	3.40			7-8; 8 in favor
	8	322	23.64	3.43			6-8; 8 in favor
	total	1083	22.86	3.69			

Social skills	6	380	36.63	7.08	2,172	,114
	7	381	37.67	6.61		
	8	322	37.14	7.09		
	Total	1083	37.15	6.93		

p<0.05

Table 5 shows the relationship between the level of social interaction of students with typical development and their grade levels. Peer attitudes mean scores was found as follows: 6th-grade $\overline{X}$=17.47, 7th-grade $\overline{X}$=18.48, and 8th-grade $\overline{X}$=18.24. In the student behavior sub-dimension the mean scores were found as: 6th-grade $\overline{X}$=22.13, 7th-grade $\overline{X}$=22.94, and 8th-grade $\overline{X}$=23.64. In the social skills sub-dimension the mean scores were found as: 6th-grade $\overline{X}$=36.63, 7th-grade $\overline{X}$=37.67 8th-grade $\overline{X}$=37.14. There is no significant difference between the social skill levels of the students with typical development and their grade levels (p>0.05). There is a significant difference between peer attitudes and grade levels (p<0.05). The difference was in favor of the 7th-grades between the 6th and 7th-grades, and it was in favor of the 8th-grades between the 6th and 8th-grades. There was a significant difference between student behavior and grade levels (p<0.05). The difference was in favor of the 7th-grades between the 6th and 7th-grades, in favor of the 8th-grades between the 7th and 8th-grades, and in favor of the 8th-grades between the 6th and 8th-grades.

Table 6
The results of the independent samples t-test conducted to understand the relationship between the presence of a student with special needs among relatives and social acceptance levels and the relationship between student's attendance at kindergarten and their social skill levels

The Presence of *a student who has a person with disability among relatives*		N	$\overline{X}$	Sd	t	p
Peer attitudes	Yes	266	18.44	3,54	1,808	,071
	No	796	17.97	3.72		
Student behavior	Yes	266	23.31	3.32	2,183	**,029**
	No	796	22.75	3.79		
Social skills	Yes	266	38.29	6.59	3,074	**,002**
	No	796	36.78	7.01		
Kindergarten						
Peer attitudes	Yes	798	18.01	3.73	-.805	,421
	No	276	18.22	3,58		
Student behavior	Yes	798	22.87	3.66	,055	,956
	No	276	22.85	3.79		
Social skills	Yes	798	36.80	6.89	-2,667	**, 008**
	No	276	38.09	6.95		

p<0.05

In Table 6, the relationship between the status of having relatives with disabilities and the social acceptance levels toward individuals with special needs is given. The mean scores in the peer attitudes sub-dimension are as follows; those who have a person with disability among relatives was $\overline{X}$ = 18.44, while the mean scores of those who do not have a person with disability among relatives was found as $\overline{X}$ = 17.97. As for the student behavior sub-dimension, the mean scores of students who have a person with disability among relatives was $\overline{X}$ = 23.31, while the mean scores of students who do not have a person with disability among relatives was found as $\overline{X}$ =22.75. Last but not least, in the social skills sub-dimension, the mean scores of the students who have a person with disability among relatives was found as $\overline{X}$ =38.29, while the mean scores of the students who do not have a person with disability among relatives was $\overline{X}$ =36.78. No statistically significant difference was observed between the attitudes of peers, which is one of the sub-dimensions of social acceptance, and the presence of a relative with disability among students (p>0.05). It was found that there was a statistically significant difference between the student behavior sub-dimension and the status of the presence of a person with disability among the relatives of the students with typical development (p<0.05). It is seen that there existed a significant difference between the social skills sub-dimension and the presence of a person with disability among their relatives (p<0.05), the differentiation was again in favor of students those who have a relative with disability.

When Table 6 is examined, the relationship between the attendance to kindergarten status of the students with typical development and their social acceptance levels toward individuals with special needs can be seen. The mean scores in the peer attitudes sub-dimension of social acceptance were found as follows; the students who attended kindergarten had a mean score of $\overline{X}$ =18.01, while the students who did not attend kindergarten had a $\overline{X}$ = 18.22. As for the student behavior sub-dimension the mean scores of the students who attended kindergarten was $\overline{X}$ = 22.87, while the mean scores of the students who did not attend kindergarten was found as $\overline{X}$ = 22.85. Finally, the mean scores of the students who attended kindergarten in the social skills sub-dimension was found as $\overline{X}$ = 36.80 while those who did not attend kindergarten had a $\overline{X}$ = 38.09 mean score. Considering the findings in Table 6, it was found out that there was no statistically significant relationship between peer attitudes and student behavior toward individuals with special needs and the status of previous attendance to kindergarten of students with typical development (p>0.05). However, a significant difference between the social skill

levels of students with typical development toward individuals with special needs and their attendance to kindergarten was found (p<0.05), and the difference was in favor of the students who did not attend kindergarten in the past.

Table 7
The results of the independent samples t-test conducted to understand the relationship between students' attendance to nursery and their social skill levels and the relationship between the family status of students and their social acceptance levels toward students with special needs

Nursery		N	$\overline{X}$	Sd	t	p
Peer attitudes	Yes	451	17.98	3.79	-.635	,525
	No	613	18.13	3.62		
Student behavior	Yes	451	22.75	3.74	-1,046	,296
	No	613	22.98	3.61		
Social skills	Yes	451	36.54	7.11	-2,348	**,019**
	No	613	37.55	6.81		
Family status						
Peer attitudes	Nuclear family	841	18.14	3.69	1,234	,217
	Extended family	232	17.81	3.70		
Student behavior	Nuclear family	841	22.88	3.75	,240	,810
	Extended family	232	22.81	3.44		
Social skills	Nuclear family	841	36.90	6.98	-,2,028	**,043**
	Extended family	232	37.94	6.66		

p<0.05

Table 7 shows the relationship between the nursery attendance of students with typical development and their social acceptance levels toward individuals with special needs. Peer attitudes mean scores were found as follows; the mean scores of the students who attended nursery was found as $\overline{X}$ = 17.98, while the students who did not attend nursery had a mean score of $\overline{X}$ = 18.13, in the student behavior sub-dimension the means scores of the students who attended nursery was $\overline{X}$ = 22.75, while it was found as $\overline{X}$ = 22.98 for those who did not attend. Finally, in the social skills sub-dimension the mean scores of the students who attended nursery was $\overline{X}$ = 36 .54, while the mean scores of the students who did not attend was found as $\overline{X}$ = 37.55. Considering the findings in Table 7, it was found that there was no relationship between peer attitudes and student behavior toward individuals with special needs and the status of going to kindergarten for students with typical development

(p>0.05), however, a statistically significant difference was observed between the social skills of the students with typical development and their attendance to nursery toward individuals with special needs (p<0.05). The difference is in favor of the students who did not attend nursery.

In Table 7, the relationship between the status of living in a nuclear or extended family of students with typical development and their social acceptance levels toward individuals with special needs is presented. In the peer attitudes sub-dimension, the mean scores of the students living in a nuclear family was found as $\overline{X}$ = 18.14, the mean scores of those who were living in an extended family was $\overline{X}$ = 17.81. In the student behavior sub-dimension, the mean scores of the students living in a nuclear family was $\overline{X}$ = 22.88, while the mean scores of the students living in an extended family was $\overline{X}$ = 22.81. Finally, in the social skills sub-dimension, the mean scores of the students living in a nuclear family was $\overline{X}$ = 36.90, the mean scores of the students living in an extended family was determined as $\overline{X}$ = 37.94. No statistically significant difference between the peer attitudes and student behavior toward individuals with special needs and their family situations was found (p>0.05). However, there is a significant difference between the social skill levels of the students with typical development and their family status (p<0.05), it is seen that the difference was in favor of students with typical development who were living in extended families.

CONCLUSION and DISCUSSION

The results of the study showed that among the sub-dimensions of social acceptance of female students toward inclusion students, the dimensions of peer attitudes, student behavior, and social skills were higher than those of male students. In previous studies, the level of social acceptance of 1454 students toward students with special needs was examined and it was found that the level of social acceptance was higher among female students than male students (Ayral et al., 2013). In the study conducted by Townsend et al. (1993), female peers were found to have more positive attitudes toward students with special needs than males. In the study conducted by Veenman et al. (2004), it is highlighted that the social acceptance of female students compared to male students is higher toward children with facial scars or special needs. In other studies, it is found that the median score of social acceptance scale for peers with special needs is higher in female students than that of male students and there is a significant difference between them (Koyuncuoğlu, 2016; Sarı et al., 2010; Georgiadi et al., 2012). The results of this study verify that the gender variable significantly affects the level of social acceptance.

At the end of the study, it was found that there was a significant difference between the grade levels of students with typical development and the sub-dimensions of student behavior and peer attitudes, which are sub-dimensions of social acceptance toward

individuals with special needs. In the peer attitudes sub-dimension, 7th-grade students scored higher than 6th-grade students and 8th-grade students scored higher than 6th-grade students. In the student behavior sub-dimension, 7th-grade students scored higher than 6th-grade students, 8th-grade students received higher scores than 7th-grade students, and 8th-grade students scored higher than 6th-grade students. Therefore, it can be stated that as the grade levels of students with typical development increased, peer attitudes and student behavior, which are sub-dimensions of social validity, increased positively toward individuals with special needs. Previous studies revealed that the grade level of students with typical development impact on the attitude toward students with special needs (Kargın and Baydik, 2002). There are also research results which shows that the level of social acceptance toward individuals with special needs increases as the age level increases especially during adolescence (Koyuncuoğlu, 2016; Pijl and Frostad, 2010). However, contrary to these results, there exist studies with different findings as well. As a result of the research conducted by Ayral et al. (2013), it is stated that there is no relationship between the class levels of students with typical development and their social acceptance levels toward individuals with special needs. Similar research results emphasize that young children have higher levels of social acceptance toward their peers with special needs. The definition of disability is perceived more negatively with the increase in the age (Popp and Fu, 1981; Hall and McGregor, 2000). However, the present study's finding as the increase in class level leads to an increase in peer attitudes and student behavior sub-dimensions of social acceptance can be because of the recent widespread implementation of inclusive education activities in general education schools for students with typical development in Türkiye (Odluyurt, 2018; Özkubat et al., 2016; Kılıç, 2011; Özgönenel and Girli, 2016; Şahin and Güldenoğlu, 2013).

The results of the study revealed that in the student behavior and social skills dimensions the students with typical development who has an individual with special needs among their relatives had higher scores compared to those who does not have a relative with special needs. There was no significant difference between social acceptance levels in the peer attitude dimension. The results of Ayral et al.'s (2013) study, in which the friendship dimension of social acceptance toward students with special needs was measured, revealed that there was no significant difference between the friendship levels of the students who have or don't have siblings with special needs. In another study The Social Acceptance Scale score of the students who knew a person with disability out of or in their family was found to be higher (Koyuncuoğlu, 2016). There are also research results (Nevill and White, 2011; Kargın and Baydık, 2002) stating that the presence of a person with disability among first or second degree relatives affects the social acceptance levels toward individuals with special needs.

The results of the study revealed that there was no significant difference between the mother's education levels of the students with typical development and the social acceptance levels toward individuals with special needs. In the study conducted by Ayral

et al. (2013), similar findings were reached. As a result of the present study, there was no relationship between the education levels of students with typical development and their social acceptance levels. Again, as a result of this study, there was a significant difference between the father's education levels and social acceptance levels of students with typical development in the student behavior and social skill levels sub-dimensions. In the student behavior sub-dimension, it was revealed that the difference was between those whose fathers were secondary school and high school graduates, and those whose fathers were secondary school graduates had higher scores. In the social skills sub-dimension, it was found that the difference was between postgraduate and primary school graduates and it was in favor of primary school graduates. As for the difference between high school graduates and graduates of postgraduate education it was in favor of high school graduates. As a result of the study conducted by Ayral et al. (2013), it was found out that the social acceptance levels of students with typical development whose fathers were high school graduates were higher than those who graduated from a university. As a result of this study, while there is no significant difference between the education level of the mother and the social acceptance levels of the students with typical development, there is a significant difference between the education level of the father and the social acceptance levels of the students with typical development (Ayral et al., 2013). In the study conducted by Dağlı-Gökbulut et al. (2017), significant differences were found between social acceptance scores according to the father's education level. Students whose fathers have undergraduate and master's degrees have lower social acceptance scores than the students whose fathers are primary, secondary and high school graduates. Children are not born with attitudes, but they learn their attitudes later (Kağıtçıbaşı, 1988), and they get their first attitudes largely from their parents. This finding shows that fathers with undergraduate and graduate degrees do not benefit from education programs that include a perspective on students with special needs. It can be said that this situation may negatively affect the social acceptance levels of the students with typical development.

When the previous research findings (Öncül and Batu, 2005) are examined, it can be seen that the limited cooperation between the school and the family regarding inclusion practices and the fact that the parents of children with typical development are aware of the existence of students with special needs only through their children who attend an inclusion class can be the reason behind this finding.

According to the results of the study, it was revealed that the level of social skills sub-dimension of social acceptance toward individuals with special needs, was found as lower for students with typical development who attended kindergarten or nursery in the past. The previous studies revealed that inclusion applications or teaching environments organized and carried out without planned activities to positively change attitudes toward students with disabilities and improve social acceptance do not improve the acceptance levels of children with typical development, and even reinforce existing negative attitudes and reduce social acceptance levels (Siperstein and Bak, 1985). Due to these reasons,

especially in pre-school and primary education stages, because of the lack of effective and planned practices of inclusion, students with typical development do not adopt students with special needs as playmates, they can have negative perceptions toward inclusive students in terms of their mental, emotional and social development (Buysse, Goldman, and Skinner, 2002; Harper, 1997; Guralnick, Neville, Hammond, and Connor, 2007; Lee, Yoo, and Bak, 2003; Royal and Roberts, 1987).

According to the results of the study, while there was no significant difference between living in a nuclear or an extended family for students with typical development in the dimensions of peer attitudes and student behavior, which are among the social acceptance sub-dimensions toward students with special needs. However, there was a significant difference in the social skills dimension. Considering the results of this study, it was figured out that the students with typical development living in extended families had higher social skill levels toward students with special needs. The previous research results emphasized that individuals who grow up in extended families are affected by the cultures and perceptions of grandparents in addition to the parent factor (Ünal, 2013). The importance of family structure is emphasized in solving social problems and in the development of the social aspect of an individual (Özdemir et al., 2009). The sub-dimensions of perceived social support from the family were higher in mothers living in extended families compared to the mothers living in the nuclear families. This suggests that in extended families, parents share their duties and responsibilities for educating their children, and the perceived social support from the family is high (Bahar et al., 2009).

In increasing the social acceptance levels of their peers toward students with special needs, enabling the development of social skills and providing peer support are considered as important factors (Lorger et al., 2015; Košir, 2013; Ayral et al., 2015; Metin, 1992; Sucuoğlu and Özokçu, 2005). These are expected to positively affect the attitude toward students with special needs as well. Therefore, it can be recommended to spend effort on teaching social skills to students with special needs and those with typical development within the scope of inclusion practices in the school environment. In this respect, planned and effective activities should be included in the kindergarten and nursery periods of students with typical development, and their social acceptance levels should be increased. Information activities about inclusion practices for secondary school students should be increased by the Directorates of National Education in Türkiye. Academic and social activities should be included in the classroom that will enable students to realize each other's needs and improve their social relationships. The inclusive students who have inadequacies were handled in general in the study. Therefore, the limitation of the study is that the relationship between the social acceptance of inclusion students and the types of disability was not examined. In future studies, the social acceptance levels of students with special needs with different disabilities can be compared. Comparisons can be made by examining the social acceptance levels of primary and secondary school students toward students with special needs. In

addition, the social acceptance levels of parents and teachers toward inclusive students can be evaluated.

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Research

Developing a Number Sense-Based Instructional Design to Eliminate Student Errors Based on Mathematical Misconceptions

Pelin Üredi [1]

Abstract:

The purpose of this research was to develop and evaluate a number sense-based curriculum aiming to eliminate student errors due to mathematical misconceptions. A mixed method research model as one of the qualitative research approaches was adopted in this study aiming to develop a number sense-based instructional design to eliminate student errors arisen from mathematical misconceptions in secondary school students. In preparation stage of the instructional design, 27 seventh grade students studying at a state school in Mersin province were determined as the study group. At the stage of developing and evaluating the instructional design, 24 fifth grade students studying at a state school in Mersin province were determined as the study group. In the process of developing the instructional design, "Needs Analysis Student Interview Form," "Instructional Design Teachers' Board Interview Form," and "Expert Interview Form" were used. When all these results were evaluated together, it would be correct to say that number sense was an important prerequisite for the interpretation and use of mathematical knowledge, and it would be efficient on eliminating errors arisen from the mathematical misconceptions when it was integrated into an effective instructional design.It was possible to suggest that further researches should be conducted for determining the misconceptions of the students related to different mathematics sub-topics.

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INTRODUCTION

Information has recently been changed, developed, and used very rapidly. In fact, the remarkable point here is adaptation into this situation and structuring the information accurately. The key point of this change in knowledge is education. Education that starts in family at birth continues providing individuals with desired behaviors in formal institutions through instructional programs. As of 2005-2006 academic year, the curriculums in our country have been restructured according to the constructivist approach. According to Özdemir and Uyangör (2011), new curriculums have highlighted the cognitive dimension of learning, and emphasis on individualized learning centering the learning needs of the students has been the main vision of the program. All these changes have caused each discipline to adopt different visions and goals. Curriculums include many elements that interact with each other in achieving the goals, but the guide for how to teach is instructional design. According to Fer (2009), if the design of instructional systems focuses on pure teaching instead of the whole education system, it appears as the instructional design. The main purpose of instructional design is to plan, develop, evaluate, and administer the instructional process (Akay, 2017). This is a process which is possible by performing detailed analysis of all of the components that are involved in the teaching process. In cases where the instructional process in the curriculum is not designed effectively, it will be difficult to talk about meaningful learning. According to Şen and Erişen (2002), the basic element of the instructional system is the teachers who are the implementers of the curriculum. The success of a curriculum is directly dependent on the characteristics of the teachers, and it is not disconnected from the instructional designs that teachers benefit as a guide. Instructional design models include the tools to be used in teaching environments to support student learning (Fer, 2009). An instructional design approach should focus on the product within the framework of learner characteristics (Morrison, Ross, and Kemp, 2012). Taking all of the precautions to increase the quality of the product and implementing them in this process will result in the highest level of the efficiency and output. It is very important to benefit from these instructional design approaches while achieving the goals of the curriculum.

As in all curricula, the effectiveness of the teaching process in mathematics curriculum is possible to be improved with the instructional design. There are various interrelated concepts and processes in the discipline of mathematics and teaching of these concepts continues with formal education starting from early childhood. Mathematical operation processes are created through the relationships of concepts with each other. "Although conceptualization in children is a very difficult and slow process, children begin to acquire concepts at the age of one or two. The children at a young age encounter new information every day and either associate this information with pre-existing concepts or develop new concepts" (Arnas, 2005, p.3). According to this, mathematical concepts are the basis for mathematical operations and skills. The concept misconceptions that will occur in the future will be prevented when the students are correctly taught about these concepts at the first time in which they see these concepts. Because the mathematical misconceptions that start

developing in earlier periods will turn into mathematical mistakes (mathematical fallacies) and mislearning when the sophistication of the topics increases. It has been emphasized in revised 2018 primary education mathematics curriculum of the Ministry of National Education (2018) that mathematics education is one of the basic skills and competencies and contributes upon a happy and successful life. Administering mathematics teaching process with an instructional design approach plays an active role in achieving the goals of the curriculum. Considering as a theory, the elements of instructional design were presented in Figure 1.
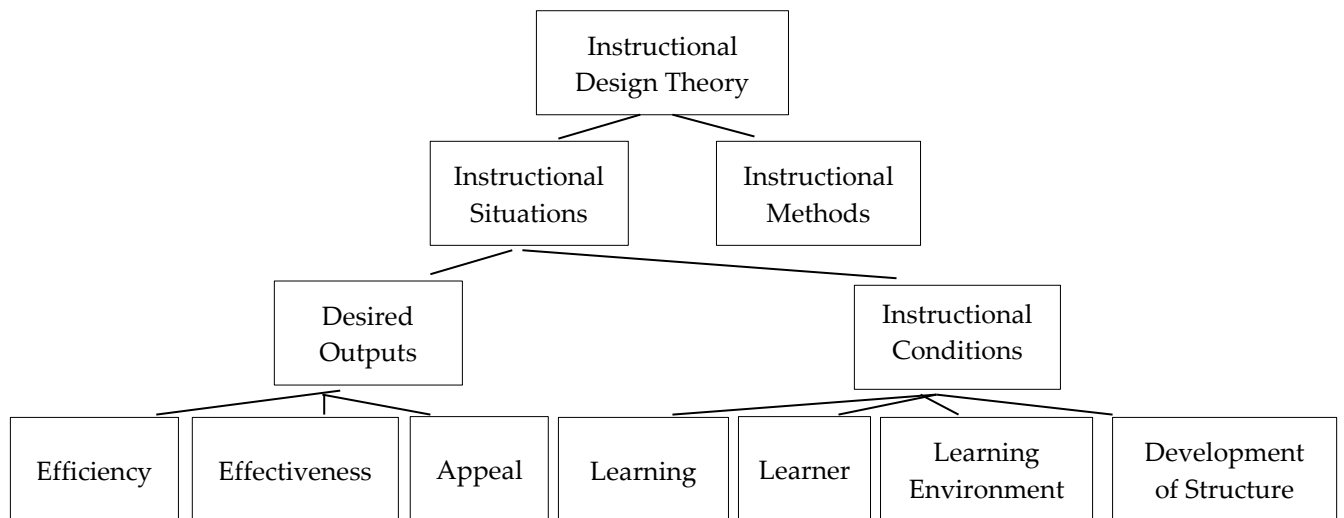
Figure 1. Instructional Design Theory and its Elements

Reference: Reigeluth (1999)

According to Figure 1, an instructional design output should be efficient, effective, and appealing. Moreover, it should guide for the development of education providing necessary instructional conditions. Various teaching models have recently been used. The most frequently used of these instructional design models are specified as ADDIE, Gagne & Briggs, Morrison, Ross & Kemp model (Khodabandelou and Samah, 2012). In this research, an instructional design was developed in accordance with Morrison, Ross & Kemp model.
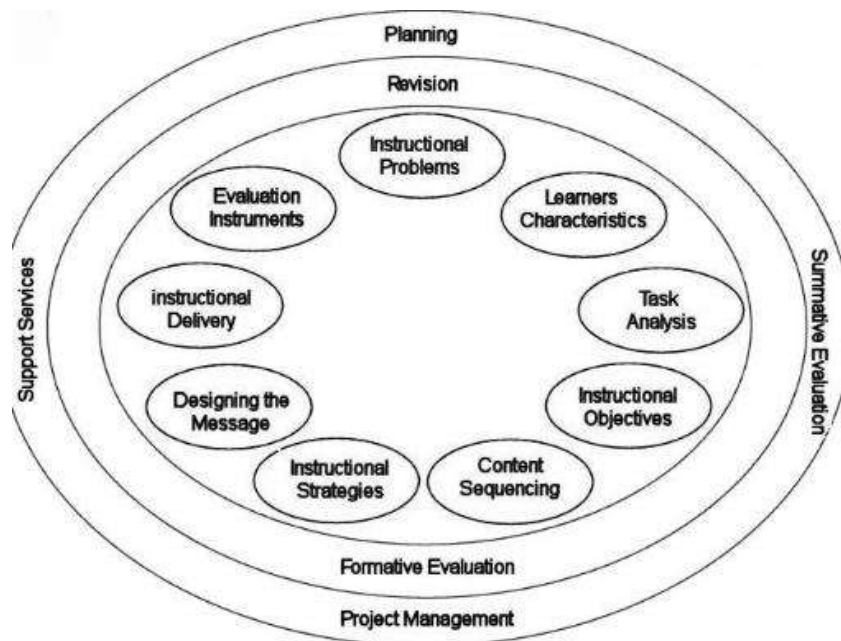
Figure 2. Instructional Design Model of Morrison, Ross & Kemp

Reference: Morrison, Ross & Kemp (2012)

Mathematical Misconception

According to Akkaya (2018), misconception is not a calculation error, lack of information or error. Error is the result of misconception and includes the errors in answers (Baki and Bell, 1997). According to Zembat (2010), misconception cannot be considered without determining the thought behind the source of the error. In this context, misconception can be defined as the perception that creates errors systematically (Smith et al., 1994). If students can explain the accuracy of their mistakes confidentially, it is possible to say that they have misconceptions (Eryılmaz and Sürmeli, 2002).

Zembat (2010) classified misconceptions into four categories as overgeneralization, overspecification, mistranslation, and restricted perception. Zembat (2010) expressed the most common misconception as the category of overgeneralization. Experiences of students play an important role in overgeneralization which can be expressed as spreading a certain rule to other concepts. Misconceptions obtained as result of experiences start establishing logical relationships with previous knowledge (Bilgin and Geban, 2001). Students come to schools with some knowledge they have in their minds. The source of this information can be expressed as the past experiences of students. Çetin (2009) stated that some of the current thinking system of the individuals used in making sense of and expressing life can be inaccurate or incomplete. This can be revealed as the source of misconceptions.

When the literature was reviewed, it was determined that there were studies carried out on eliminating the misconceptions in ordering fractions (Soylu and Soylu, 2005), part-whole relationship in fractions (Altıparmak and Özüdoğru, 2015), representation of fractions on the numerical axis (Pesen, 2008). It has been observed that studies have been conducted to identify and eliminate misconceptions. In addition to sub-topics of

mathematics, it was observed that there were studies carried out on misconceptions in different geometry sub-subjects such as polygons, quadrilaterals, space, point-line-plane, angles on the line, circumference-area-volume calculation (Erbay, 2016; Özkan, 2015; Doyuran, 2014; Doğan, 2013; Başkurt, 2011; Yılmaz, 2011; Dağlı, 2010; Jin and Wong, 2010; Kiriş, 2008; Brinkmann, 2003). It was determined in these studies that different measurement tools were used for identifying and eliminating the misconceptions. Written and oral materials, observation and interview methods, concept cartoons (Kabapınar, 2005), concept maps (Ülgen, 2004), open-ended questions (Eryılmaz and Sürmeli, 2002) were possible to be used for determining the misconceptions. Accordingly, it was also possible to specify that these materials could be used in determining and eliminating the misconceptions in different disciplines and sub-subjects as well as in mathematics.

Number Sense

Although the starting point of number sense has not been known exactly, it was possible to say that it was firstly expressed during the studies of the National Council of Teachers of Mathematics (NCTM, 1989). It was noticed that the researchers had different definitions for the sense of number (Reys and Yang, 1998; Howden, 1989; Kaminski, 2002; Berch, 2005; Howel and Kemp, 2005). According to Dehaene (2001), number sense was based on specially evolved cerebral networks to represent basic arithmetic knowledge. Sowder (1992) made inferences about the number sense and its importance while expressing the skills associated with the ability of prediction. Berch (2005) stated that there were differences between the meaning of number in mathematical cognition literature and the meaning of number in mathematics teaching literature. According to some mathematicians, students' number sense improves as their grade level increases (Sowder, 1992; Yang, 1995). In the book titled Curriculum and Evaluation Standards for School Mathematics, the children with number sense were especially expressed as follows (NCTM, 1989, p.38).

> *Children with the sense of number (1) understand the meanings of numbers very well, (2) develop multiple relationships between numbers, (3) notice the relative magnitude of numbers, (4) understand the effects of operations upon numbers, and (5) develop reference point for measuring the objects around.*

Howden (1989) defined number sense referring the answers of students related to the number 24 as "two tens and four cents," "two dozen of eggs," "6 cents subtracted from 3 tens," "my uncle turned 24 on Saturday," "I will be 24 in 17 years," and "the number 24 is approximately in the middle of the number 20 and 30." Accordingly, the sense of number could be defined as reaching a result using more than one way. Greeno (1991) expressed that number sense included three components as *flexibility in numerical calculations*, *numerical prediction*, and *numerical reasoning and inference*. McIntosh et al. (1992) stated that the number sense included three components as *the concept of number*, *operations with numbers*, and *number and operation applications*. Sowder and Schappelle (1994) made a different distinction and categorized the sense of number under two components as *understanding numbers* and

calculating by rethinking. For example, when making the 26+43 mathematical operation, 20 and 40 were firstly summed and 60 was obtained. Then 6 and 3 were summed together and added to the number 60. The mental process operated here was understanding and re-sensing the numbers.

According to all this information, "perception" is on the basis of mathematical misconceptions. Misperceptions or incomplete perceptions cause misconceptions, and these lead students to make mistakes. Inability to make sense of information depending on perceptions prevents noticing and using different ways of solution. Providing environments and activities to improve the sense of number in individuals as of early childhood prevents mathematical misconceptions (Umay, 2003). Knowing what the number means, interpreting it and reaching conclusions using different ways reduces the errors that appeared due to misconceptions. Carrying out studies on eliminating the misconceptions as one of the basic obstacles for mathematics failure and developing the number sense of individuals should be regarded as the eternal goal of mathematics teaching. Therefore, the number sense-based instructional design developed in this study could be a guide for eliminating the mathematical misconceptions as the responsible of errors in mathematics. Because developed instructional design included cognitive, affective, and psychomotor skills of the students, it was expected to be a guide for teachers in mathematics lessons and have contribution upon curriculum development studies. Furthermore, this research aimed to make mathematics a concrete and fun lesson in which different methods-techniques and materials were used instead of being abstract.

Purpose of the research

In the light of all this information, the purpose of this research was to develop and evaluate a number sense-based curriculum aiming to eliminate student errors due to mathematical misconceptions. In line with this main purpose, answers were sought for the following questions:

1. What were the views of students related to the need for an instructional design in eliminating mathematical misconceptions?
2. What were the student input behaviors to develop an instructional design aiming to eliminate mathematical misconceptions?
3. What was the effect of a number sense-based instructional design upon eliminating misconceptions?

METHOD

Research Model

A mixed method research model as one of the qualitative research approaches was adopted in this study aiming to develop a number sense-based instructional design to eliminate student errors arisen from mathematical misconceptions in secondary school students. According to Cresswell and Clark (2007), data collection, analysis and integration

were performed with qualitative and quantitative methods in mixed method research. If the truth was desired to be understood within a holistic and rich framework, both qualitative and quantitative dimensions should be examined (Yıldırım and Şimşek, 2013). In this study, both qualitative and quantitative methods were employed as it was aimed to collect data on development and efficiency of an instructional design.

Study Group

In preparation stage of the instructional design, 27 seventh grade students studying at a state school in Mersin province were determined as the study group. The research data were collected in 2019-2020 academic year. At the stage of developing and evaluating the instructional design, 24 fifth grade students studying at a state school in Mersin province were determined as the study group. Moreover, in the stage of developing the instructional design, a teachers' board including 4 mathematics teachers and a validity committee including 3 field experts were created. While determining the study group, criterion sampling method as one of the purposeful sampling methods was used. The criteria of the study were determined to have prerequisite knowledge about operations on the number line in terms of students, to have at least 5-year professional seniority in terms of teachers and to carry out studies on the subject in terms of the field experts.

Data Collection Tools

In the process of developing the instructional design, "Needs Analysis Student Interview Form," "Instructional Design Teachers' Board Interview Form," and "Expert Interview Form" were used. Furthermore, "Numerical Axis Operations Skill Form" (NAOSF) was performed to the students for determining student input behaviors and evaluating the efficiency of instructional design. The forms used in the interviews with students and teachers were prepared together with the validity committee.

Numerical Axis Operations Skill Form (NAOSF) used to determine student input behaviors and evaluate the effect of instructional design was developed by the researchers. For the validity study of the form, the opinions of 3 field experts from the Validity Committee were consulted to examine content and language validity. As result of the analyses, the Numerical Axis Operations Skill Form (NAOSF) was used in the pilot implementation with 14 students excluded from the study group. In the Numerical Axis Operations Skill Form (NAOSF) finalized after the pilot implementation, there were number sense-based 40 questions including multiple choice, open-ended, and gap-filling sections. The highest score possible to be obtained from the evaluation form was determined to be 54. One way for determining whether the method used was efficient or not was to analyze its reliability (Jackson, 2008, p. 67). Therefore, the student answers were scored separately by the researchers in line with the rubric prepared previously. The fit relationship between raters was calculated to be .91 using the Pearson Correlation Coefficient. According to Büyüköztürk (2006), the correlation coefficient (r) indicated high correlation level for the

values between .70 and 1.00. A sample question in the *Numerical Axis Operations Skill Form (NAOSF)* is shown in figure 3.

E- Please sort on the number line of the parameters whose decimal representation is given below.
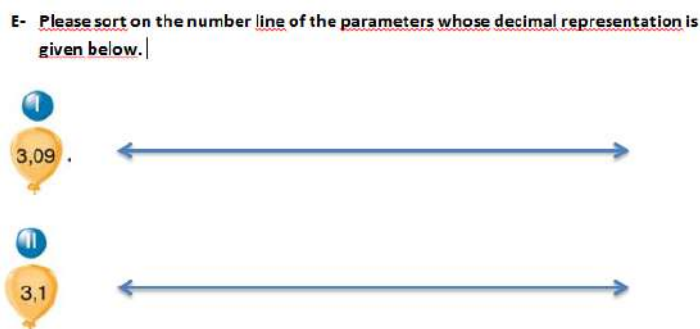
Figure 3. A Sample Question in the *Numerical Axis Operations Skill Form*

Data Analysis

Descriptive analysis technique was used for the analysis of the data obtained from the interview forms. Paired groups t-test as one of the parametric tests was used for analyzing the pre-test-post-test score differences obtained from the Numerical Axis Operations Skill Form. In addition, all data were analyzed at macro level after the research was completed. For ensuring coder reliability (Miles and Huberman, 1994), the researchers were allowed to encode independently on the interview texts and the coder reliability was calculated to be .92.

Ethical considerations

A volunteer consent form was presented to parents and teachers on behalf of the students. Throughout the research, the volunteering of the participants was regarded, and the participants were not forced for any implementations. Throughout the implementation, the participants were given right to leave the study.

In this study all rules stated to be followed within the scope of "Higher Education Institutions Scientific Research and Publication Ethics Directive" were followed. None of the actions stated under the title "Actions Against Scientific Research and Publication Ethics", which is the second part of the directive, were carried out. Ethics committee approval was not required as the research data were collected in 2020.

RESULTS

Stages of the Instructional Design

Needs Analysis

For deciding on the subject area of the instructional design, secondary school mathematics course books used in schools were analyzed firstly. In these analyzed textbooks, the subject areas allocated with the most weight and time during the academic

year were priorly determined. Subsequently, the subjects with the highest percentage of questions in the student selection exams for high schools with different names in the last 10 years were determined. In addition, information was collected from the teachers' board about the subjects they allocated the most time while lecturing. As result of these data, student errors arisen from mathematical misconceptions on the subjects related to "Numbers and Operations" learning area from the secondary school 5th grade mathematics curriculum were decided to be analyzed. "Numbers and Operations" was a unit included in each level of the secondary school gradually. Because the acquisitions were most in the fifth-grade curriculum, the sub-learning areas to be used in needs analysis study were chosen from the fifth-grade mathematics curriculum. Data was planned to be collected for deciding on the operations in the sub-learning areas of the 5th grade "Numbers and Operations" learning area to make an instructional design application. The target group was determined to be the students and teachers. At this stage, the seventh-grade secondary school students were primarily interviewed. The reason for choosing the seventh-grade students for the interview was that the "Numbers and Operations" unit in the mathematics curriculum was predominantly included in the fifth and sixth grades. In other words, since the seventh-grade students had detailed information about this unit, it was thought that more reliable answers were possible to be obtained from them to the interview questions. Twenty-seven seventh grade students studying at a public school in Mersin province participated into the interview. The gender distribution of these students was presented in Table 1.

Table 1

Gender Distribution of the Students Interviewed in the Stage of Needs Analysis

Gender	N	%
Female	15	55.6
Male	12	44.4

The interview questions addressed to the students were for determining the sub-learning areas they had the most difficulty in the unit of "Numbers and Operations". The first of these questions was "*What is the most difficult subject you have while learning the numbers and operations unit?*" And the second question was "*What do you think is the reason you have difficulty while learning this subject?*" In order for the answers obtained from the students to be clear, the acquisitions of the unit were written on the board. The frequency distribution of the data obtained from the interview questions was presented in Table 2.

Table 2

The Subjects Students Had the Most Difficulty in Numbers and Operations Unit

Acquisitions	f	%
Indicates and orders unit fractions on the number axis.	9	33.3

Indicates and orders the numbers in decimal notations on the number axis.	8	29.6
Orders the fractions with equal numerators or denominators.	5	18.5
Compares a natural number and a compound fraction.	3	11.1
Finds the elements (multiplier, quotient, or divisor) that were not given in operations understanding the relationship between multiplication and division operations.	1	2.7
Associates a percentile expression with a fraction and decimal notation representing the same size, converts these notations into each other.	1	2.7

According to Table 2, the first of the acquisitions the students participating in the interview had the most difficulty was determined to be "Indicates and orders unit fractions on the number axis" and the second one was "Indicates and orders the numbers in decimal notations on the number axis." This acquisition was complementary to each other. In other words, representation on the number axis was the prerequisite for ordering and fraction knowledge was the prerequisite for decimal notation. As result of the analyses on the data obtained from the interviews, it was concluded that the students had difficulties in indicating the number axis, these difficulties were caused due to misconceptions and lack of sense of number, and the students spent much time in solving the questions about this subject. Subsequent to the needs analysis study, it was decided to develop the instructional design for the subject area of "Numbers and Operations" related to the acquisitions of "Indicates and orders unit fractions on the number axis" and "Indicates and orders the numbers in decimal notations on the number axis." Since the subjects were based on numerical knowledge, the instructional design was planned to be prepared depending on number sense enabling students to use different ways for reaching to solutions making logical inferences. These two acquisitions were combined as *Operations on the Number Axis* to be the instructional design of an operative process. In other words, student errors arisen from mathematical misconceptions were decided to be analyzed on operation skills on the number axis.

Learner Analysis

In order to collect data for learner analysis, two-hour lessons were lectured with the 5th grade students on the specified subject. In this course, exercises were performed to determine the students' input characteristics, and then the Numerical Axis Operations Skill Form (NAOSF) prepared as a pre-test implementation was employed to the 5th grade students, as the primary target group. This form performed as a pre-test for determining the input behaviors of students was also performed as a post-test for specifying the efficiency

of the instructional design. The information related to the pre-test scores of the students about the operation skills on the number axis was presented in Table 3.

Table 3

Analysis Results Related to the Pre-test Scores of the Students Regarding the Numerical Axis Operations Skill Form

Number of Participants	Mean	Standard Deviation	Mod	Median	Min Score	Max Score	Max Score Possible to	Skewness	Kurtosis
24	13.66	7.12	10	12.5	3	30	54	1.11	.87

As presented in Table 3, the arithmetic mean of the pre-test scores of the participants related to Numerical Axis Operations Skill Form before the implementation process was 13,66. Because the highest score possible to be taken from the Numerical Axis Operations Skill Form was 54, the success levels of the participants in terms of input behaviors were possible to be mentioned as low. Some of the student answers given to the Numerical Axis Operations Skill Form were presented in Figure 3 and Figure 4.
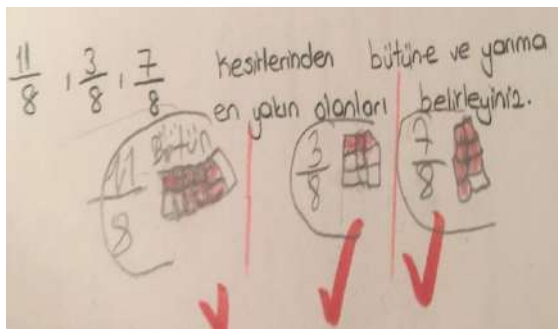
Figure 4. Student Answers Related to Input Behaviors Form-1
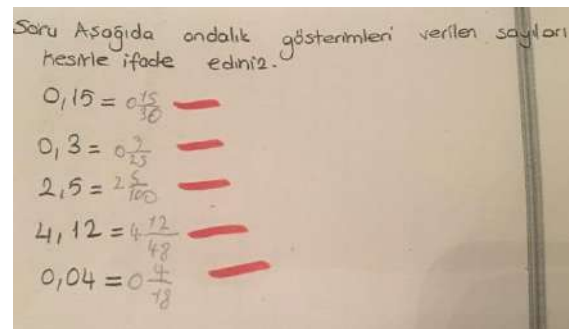
Figure 5. Student Answers Related to Input Behaviors Form-2

According to Figure 3, the students had misconceptions confusing on proximity to the whole and half of the multiplicities shaped as fractions. Errors were determined in student answers due to misconceptions. According to Figure 4, the misconception indicating the inability of making transfers between decimal representation and fraction representation was remarkable. A group assessment was made with four mathematics teachers with 7 to 10-year professional seniority on student answers. The common view of the group teachers was as follows:

> "Answers of the students were meaningful. Particularly, while lecturing the indication of fractions and decimal notations on the number axis and operations in the lesson, more questions were asked by the students and it was observed that more errors were made in these subjects in assessment process. It was observed that the students had misconceptions arisen from lack of conceptual knowledge about the subject. They thought that the numbers in the

numerator and denominator of the fraction came from a different number system." (Branch Teachers Board)

The information related to the target group administered with instructional design was as follows:

First Target Group (The implementation was performed for these students.)

- Secondary school 5th grade students

Secondary Target Group (The implementation will be voluntary for these students. The students who feel inadequate on this subject could participate)

- Secondary school 6th grade students

General learner characteristics

- Age: 10-11
- Gender: 46% (f=11) female, 54% (f=13) male (first target group)
- Level of literacy: All students had literacy skills (first target group)
- Socioeconomic levels of the students were medium and over (first target group)
- The mostly loved courses were Mathematics, Physical Education, Turkish, respectively (first target group)

Input characteristics

- It was observed that they had difficulty in establishing the relationship between the fraction number corresponding to a certain multiplicity and this multiplicity.
- Errors on using numerator and denominator interchangeably was observed due to not comprehending the part-whole relationship fully.
- Misconceptions were observed while classifying fractions as proximity to the whole and proximity to the half.
- The students were observed to follow a single way while establishing a relationship of size or equality between decimal representations.

Common errors of the target group:

- The students had difficulty in creating the denominator while writing the numbers with decimal notation as fractions.
- The students fell into misconceptions not being able to determine what decimals meant as numbers.

Academic knowledge

- Previous year grades of the learners for the mathematics course were medium and high.
- General grade averages of the learners related to the previous year were low, medium, and high.
- Previous year grades of the learners for other relevant courses were medium and high.

It was determined that the errors were the result of misconceptions arisen from the lack of sense of number. An example of student errors appeared depending on the observed misconceptions was presented in Figure 5.

Figure 6. The error made as result of misconception based on sense of number

According to Figure 5, the student was asked to place the given decimal notation in approximately the correct place in the interval shown on the number axis. It was possible to say that there was a misconception related to the decimal part that came after the full part of the decimal notation. The basis for this misconception was the inability of understanding and perceiving the number. Whereas the decimal representation of 34.46 should be closer to 34.3, the lack of number perception in the student prevented him/her from obtaining conclusions using different ways and caused him/her to make mistake driving to misconception.

Context Analysis

The information related to the contextual factors to be considered for the development and implementation stages were as follows:

Guiding context

- Why did you want to learn this course?

The learners stated that they wanted to learn this course because mathematics was used in every profession and situation and it would be useful in their daily life, shopping.

- How could you benefit from the information you learned in this lesson?

The learners stated that they could benefit from this information in their other courses, daily life, and mathematics lessons.

- What kind of acquisitions you expected at the end of this course?

The learners stated that they could get high grades from the mathematics course, they could get certificates of appreciation or excellence, and they could choose the profession they wanted answering the math questions correctly in the exams.

Transfer Context

- How did you apply the knowledge and skills you learned in similar or different situations?

The learners stated that they had the opportunity of applying the knowledge they acquired in mathematics in many courses, especially in Science. They stated that they could understand some expressions they could not make sense on TV.

- Where and how could you use this information?

The learners stated that they could use this information in their daily lives, family conversations, at school, and answer questions mathematically correctly.

- What conditions did you think were necessary for you to use these information and skills?

The learners stated that there should be conditions and environments such as a good family environment, school environment, working environment, and competitions.

Learning-Teaching Context

The information related to learning-teaching environments was presented in Table 4.

Table 4

The information related to learning-teaching environment

Factor	Points to be considered
Lighting	Since the classroom was on the top floor, there was no problem with lighting. Sunlight and lighting were benefited.
Noise	Since the classroom was on the top floor, the noise outside the school was not heard from the classroom.
Temperature	Since there was no air conditioning in the classroom in summer, the temperature increased, and the ideal temperature was reached in winter when the radiators burnt out.
Order of seating	The order of seating in the classroom was standard classroom seating with three groups. Two students sat in each desk. Their desks were separate, but the tables were common.
Material equipment	There were a board, smart board, cupboard, and recycling bin in the classroom, and the materials were brought to the lesson from the material room when needed. However, new generation materials aren't used for maths course.
Transportation	The school had a central location. It was on the bus and subway route.

Content Analysis

The content analysis related to the subject was presented below.

Prerequisite knowledge:

- It was necessary to have knowledge on whole number, natural number, cardinal number, and concept of number.
- It was necessary to have a sense of number and use it in transactions.

Factual knowledge:

- Z: Set of whole numbers
- /: Fraction bar

Concepts:

Fraction, rational number, unit fraction, simple fraction, compound fraction, mixed fraction, number axis, decimal notation

The concept analysis created by the field experts for the concepts was presented in Table 5.

Table 5

Concept Analysis

Name of the concept	Fraction
Definition	Fractions are numbers representing one or more of the equal parts into a unit is divided. Because a whole cannot be negative, fractions cannot take negative values. * The denominator indicates how many equal parts a whole is divided into, and the numerator indicates how many of these parts are taken or scanned. * The division of a number by zero is undefined. Since we cannot divide a whole into zero parts, there cannot be zero in the denominator.
Distinctive features of the concept	a and b must be integers each and b must be different from zero (a/b) Fractions cannot take negative values.
Nondistinctive features of the concept	Having numerator, denominator and fraction bar, denominator being a non-zero number
Examples of the concept	$\frac{1}{2}, \frac{6}{7}, \frac{12}{4}$
Non-examples of the concept	$\frac{3}{0}, \frac{5}{0}, \frac{8}{0} - \frac{4}{8}, -\frac{5}{11}$
Name of the concept	Rational number
Definition	There are two different ways of indicating rational numbers as fractions and decimals. However, the point to be noted here is that the fraction representation of rational numbers is a special notation, that is, it includes the part that cannot be represented negatively. Fraction notation is used as the numerical equivalent of the representations to show only certain parts of a whole.
Distinctive features of the concept	It includes the equivalence class. It can take negative and positive values. Special notations are possible with fractions and decimals on it.

Nondistinctive features of the concept	Having numerator, denominator and fraction bar, denominator being a non-zero number
Examples of the concept	$\frac{1}{2}, \frac{2}{4}, \frac{6}{12}, \frac{-2}{3}, -\frac{-4}{6}, -\frac{10}{15}$
Non-examples of the concept	$\frac{3}{0}, \frac{5}{0}, \frac{8}{0}$
Name of the concept	Unit fraction
Definition	Simple fractions with a numerator of 1 representing only one of the equal parts of a whole.
Distinctive features of the concept	Unit fractions belong to the simple fraction type. They refer to only one of the equal parts of a whole.
Nondistinctive features of the concept	Unit fractions are expressed as fractions notation. They have a numerator and denominator. They can be represented on the number axis.
Non-examples of the concept	$\frac{3}{5}, \frac{6}{7}, \frac{9}{5}, 2\frac{3}{5}$
Name of the concept	Simple fraction
Definition	The fraction with a numerator that is lower than denominator and can take values between 0 and 1.
Distinctive features of the concept	Their numerator should be less than their denominator. They are located between 0 and 1 on the number axis.
Nondistinctive features of the concept	They can be represented on the number axis. They are expressed as fraction notation.
Examples of the concept	$\frac{1}{2}, \frac{6}{7}, \frac{2}{3}$
Non-examples of the concept	$\frac{3}{2}, \ 2\frac{5}{7}, \frac{7}{3}, \frac{15}{15}$

Name of the concept	Compound fraction
Definition	The fractions with numerator which is equal or greater than its denominator.
Distinctive features of the concept	The numerator must be greater than or equal to the denominator. Because the numerator is equal to the denominator, the fraction is equal to integer 1, and when the numerator is higher than the denominator, it is higher than 1.
Nondistinctive features of the concept	They can be represented on the number axis. They are expressed as fraction notation.
Examples of the concept	$\frac{3}{2}, \frac{10}{7}, \frac{9}{5}$
Non-examples of the concept	$\frac{1}{3}, \frac{3}{5}, \frac{2}{7}$
Name of the concept	Mixed fraction
Definition	Fractions that add one or more whole to simple fractions and are a special representation of compound fractions.
Distinctive features of the concept	It is the special form of compound fractions. Mixed fractions can be converted into compound fractions, and compound fractions can be converted into mixed fractions.
Nondistinctive features of the concept	They can be represented on the number axis. They are expressed as fraction notation.
Examples of the concept	$2\frac{6}{7}, 1\frac{9}{5}$
Non-examples of the concept	$\frac{1}{3}, \frac{3}{5}, \frac{2}{7}$

Name of the concept	Number axis
Definition	It is the most basic coordinate system where each point corresponds to a related real number and the distance between the points is equal.
Distinctive features of the concept	The points including whole numbers, these are shown with equal distance between them. It is double-sided as negative and positive. It can be drawn horizontally as well as vertically.
Nondistinctive features of the concept	It is a special coordinate system. Each number has a place on the number axis.
Examples of the concept	Lifts, thermometers
Non-examples of the concept	Ruler, scissors, clock

Name of the concept	Decimal notation
Definition	It is the representation made using comma/dot between the whole and less than one complete parts of numbers on which four operations can be performed.
Distinctive features of the concept	There is no such thing as a decimal number, but the numbers have decimal notation.
	When a whole is divided into 10, 100, or 1000 equal parts, then the units of the resulting fraction are expressed in decimal notation.
	Decimal notations include the whole part and the fraction part.
	Size relationships can be determined comparing the numbers with decimal notation.
Nondistinctive features of the concept	Numbers are used to write decimal notations.
	Decimal notations can be expressed as rational numbers. Because it is a special representation of rational numbers.
Examples of the concept	3.5 – 45.24 – 0.7 – 35,313 – 201,495 – 5,0
Non-examples of the concept	$\sqrt{7}$, 5i, $\sqrt[3]{6}$

Operational knowledge:

While the fractions were presented on the number axis,

- It was decided which two integers the fraction was between and which integer it was closer to with the sense of number.
- This specified range was divided into equal parts as many as the number in the denominator.
- Starting to count from the left side, the numerator was counted and marked until it reached that number.

While the decimal notations were expressed on the number axis,

- It was decided which two integers the decimal notation was between and which integer it was closer to with the sense of number.
- On the specified range, the range of the numbers in the digits after the decimal notation was determined.
- This specified range was divided into 10 equal parts.
- Starting to count from the left, it was counted until the next digit after the comma and it was marked.

The principles:

The fractions got lower as they approached to 0 on the number axis and got greater as they approached to 1. In decimal notations, the fraction with the greater whole part is greater; if the whole parts were equal, the digits after the comma were regarded at respectively and decided according to this rule.

Target Analysis

Unit title/Subject: Fractions/Algebra

Subject: Operations on the number axis

Grade: 5

Number of courses: 10

In the instructional design to be prepared, the subject of "Operations on the Number Axis" was planned to be completed in 10 course hours. In the needs analysis study and interviews with subject area experts, it was determined that the acquisitions related to the subject should be clear and understandable, the subjects as the continuation of each other should not be fragmented, and the achievements above the student level should not be included. For this reason, the subject of "Operations on the Number Axis" was determined as the planned subject of the instructional design, and the operations of presenting the fractions and decimal notations on the number axis as a continuation of each other was included. In accordance with this purpose, the following acquisitions was used in the instructional design to be prepared for "Operations on the Number Line:"

- Indicated between which two integers a given fraction was on the number axis. (2*)
- Showed and ordered unit fractions on the number axis. (2*)
- Showed proper, compound and integer fractions on the number axis and interpreted the highness and lowness relations between them. (2*)
- Expressed the numbers given as decimal notation as fractions and fractions as decimal notation. (2*)
- Showed and ordered the numbers given as decimal notation on the number axis. (2*)

*Number of courses

The cognitive process and knowledge dimension of the acquisitions in the current program were presented in Table 6 and Table 7.

Table 6

Cognitive Process Dimension Related to Acquisitions

Acquisitions	Cognitive Process Dimension					
	Reminding	Understanding	Implementing	Analyzing	Evaluating	Creating
Indicates between which two integers a given fraction is on the number axis.			X			
Shows and orders unit fractions on the number axis			X			
Shows proper, compound and integer fractions on the number axis and interprets the highness and lowness relations between them.			X			
Expresses the numbers given as decimal notation as fractions and fractions as decimal notation.		X				
Shows and orders the numbers given as decimal notation on the number axis.			X			

Table 7

The Dimension of Knowledge Related to Acquisitions

Acquisitions	The Dimension of Knowledge			
	Factual Knowledge	Conceptual Knowledge	Operational Knowledge	Metacognitive Knowledge
Indicates between which two integers a given fraction is on the number axis.		X		
Shows and orders unit fractions on the number axis			X	
Shows proper, compound and integer fractions on the number axis and interprets the highness and lowness relations between them.			X	
Expresses the numbers given as decimal notation as fractions and fractions as decimal notation.		X		
Shows and orders the numbers given as decimal notation on the number axis.			X	

Content Editing Strategy

Message design was used as the content editing strategy in the developed instructional design. As a message design, a written text was developed for the subject of "Operations on the Number Axis."

Implementation and Assessment

Ten course hours were lectured in accordance with the instructional design prepared with the 5th grade students. In order to determine the efficiency of the instructional design at the end of the application, the *Numerical Axis Operations Skill Form (NAOSF)* was performed as a post-test to the 5th grade students as the primary target group. Subsequently, whether there was a significant difference between the pre-test and post-test mean scores of the participants was analyzed. The analysis results were presented in Table 8.

Table 8

Pre-test and Post-test Paired Groups T-Test Results Related to Students' Operational Skills in Number Axis

Measurement	Number of Participants (N)	Arithmetic Mean (X)	Standard Deviation (S)	Degree of Freedom (Sd)	t Value	Level of Significance (p)
Pre-test	24	13.66	7.11			
Post-test	24	30	9.18	23	- 17.277	.000*

*p<.001

As could be seen in Table 8, a statistically significant difference was determined between the pre-test and post-test scores of the participants (p<.001). This difference was in favor of the post-test scores. According to this result, it could be said that students' errors in number axis operation skills decreased as result of the instructional design based on number sense.

DISCUSSION

A needs analysis was primarily performed in this study with the main purpose of developing a number sense-based instructional design to eliminate student errors due to mathematical misconceptions. Subsequent to the studies carried out within the scope of the needs analysis, it was decided that the sub-topic to be developed in the instructional design would be the order and representation of fractions and the numbers given in decimal representation on the number axis.

Within the scope of needs analysis, student views were asked for an instructional design need to eliminate student errors arisen from mathematical misconceptions. According to the interviews with the seventh-grade students, the sub-learning areas the students had the most difficulty were "*indicates and orders unit fractions on the number axis,*" and "*indicates and orders the numbers given in decimal representations on the number axis,*" respectively. According to the analysis results of the answers given by the students to the reasons for having difficulty while learning these subjects, it was concluded that there were misconceptions in the concept of number axis which was the prerequisite for ordering and the operational processes related to this concept. It was seen that the students had difficulty in showing fractions and decimal notations. It was determined that there were concept misconceptions about which whole number the fractions and decimal notations would be closer to. In the interviews made with the teachers' board on student responses, it was determined that these misconceptions were caused due to the inability of using the number sense in operations related to fraction and decimal notation. When the literature was reviewed, it was noticed that different methods were used to determine the misconceptions within the scope of techniques (Ang & Shahrill, 2014; Paul & Hlanganipai, 2014; Sarwadi & Shahrill, 2014) and there were researches for eliminating the misconceptions (Durkin & Johnson, 2015; Ojose, 2015; Jankvist & Niss, 2018). Since the common feature of this study and the studies reviewed in the literature was the presence of misconceptions in students

and determining the errors related to this, this result obtained from the study was consistent with the results of the other researches. On the other hand, it was determined in some studies that the number of students who were able to use the number sense as the cause of mathematical misconceptions was low (Yang & Li, 2008; Singh, 2009; Mohamed & Johnny, 2010). In the study carried out by Filiz and Moralı (2020), it was concluded that the students used the rules they learned previously and did not prefer using an alternative way. These results proved that number sense was very important for mathematics education and benefiting from the instructional approaches based upon number sense could be efficient upon decreasing the errors arisen from misconceptions. It could be efficient on using instructional approaches based on number sense to reduce errors due to misconceptions.

As result of the learner analysis performed for determining the input behaviors of the students, it was determined that the skills of the students in the mathematics sub-topic of "Operations on the number axis" which was spirally lectured at different grades were found to be low. Misconceptions arisen from lack of perception led students to make mistakes. For that reason, misconceptions should be identified and eliminated in order to determine learning conditions of the students accurately (Osborne and Gilbert, 1980; Resnick et al., 1989). According to Stefanich and Rokusek (1992), the teaching conducted for this purpose not only eliminated misconceptions but also contributed upon facilitating learning and ensuring the permanence of what was learned. In this research, it was determined that the students had imperceptions related to the position of numbers on numerical axis. This lack of perception caused them to have difficult in the topics in relation to closeness of fractions to the half or the whole and the closeness of decimal notations to the whole numbers.

Subsequent to the needs and learner analyses, context, content, and target analysis studies were included. The instructional design prepared determining the content editing strategies was performed to the students who were the primary target group, and the measurement tool developed by the researchers was performed as the post-test for evaluating the instructional design. According to the analysis results for the pre-test and post-test score comparison of the students, there was a statistically significant difference in favor of the post-test. Instructional designs were remarkable in terms of revealing the paths to be followed in reaching the goal and guiding the process. It was concluded that the instructional design used in the study of Apino and Retnawati (2017) improved high-level thinking skills of the students in learning mathematics. Bennison et al. (2020) concluded that using instructional design could be benefited to support professional learning in arithmetic in mathematics. Similar results were also obtained in the research of Avcu and Er (2020), and it was concluded that the instructional design developed according to the instructional design model of Morrison, Ross & Kemp was efficient upon the digital thinking and creative thinking skills of the students. This situation may result from the fact that the development of instructional design requires progressing by conducting multifaceted analyses. The fact that conducting the detailed analysis of all of the components which were included in the

process by determining the needs positively contributed to the fact that the subject for which the instructional design would be developed were dealt with in depth and therefore the permanence of learning increased.

LIMITATIONS AND RECOMONDATIONS

Depending upon the results obtained from the study, it was possible to suggest that further researches should be conducted for determining the misconceptions of the students related to different mathematics sub-topics. Furthermore, in-service training could be given to teachers who were the practitioners of the curriculum in the classroom for improving their sense of number and eliminating mathematical misconceptions.

CONCLUSION

When all these results were evaluated together, it would be correct to say that number sense was an important prerequisite for the interpretation and use of mathematical knowledge, and it would be efficient on eliminating errors arisen from the mathematical misconceptions when it was integrated into an effective instructional design. Teaching by paying attention to not only the concept of number but also where and how it is used will contribute the fact that the sense of number will develop and the concept misconceptions will be prevented.

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Content-related solution quality in invention activities and worked solutions – promoting the professional vision of classroom management

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Abstract:

Invention activities and worked solutions are considered to be effective learning tasks. To date, limited research has been conducted regarding these tasks in teacher education and the process of solving these tasks. This study focuses on the solution quality of student teachers' task solutions. 149 students were randomly assigned to one of two experimental conditions: invention activity and worked solution. The latter group were given a set of categories; the former group had to invent their own categories to compare two constructed contrasting auditive cases with a focus on the subject classroom management. To determine whether it is more effective to compare cases with given categories (worked solution) or with self-generated categories (invention activity), we coded the 149 solutions regarding the content-related solution quality using qualitative content analysis. Students in the worked solution condition demonstrated a significantly higher content-related solution quality than those in the invention activity condition. Thus, it may be assumed that students of the worked solution gained a better conceptual understanding of classroom management through working on this task. Implications for the use of this task format in teacher education are discussed.

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INTRODUCTION

In teacher education, invention activities and worked solutions have barely been researched although they have great potential for teacher students acquiring conceptual knowledge and transfer skills. An increasing interest has also been shown in these task formats in instructional research (Loibl et al., 2017). A large number of studies on these task formats have been conducted, generally in school-based learning settings, often in science and mathematics (Loibl & Rummel, 2014; Schwartz et al., 2011). In higher education, only a limited number of studies have been performed in teacher education (Glogger-Frey et al., 2022) and other domains (Holmes et al., 2014; Wiedmann et al., 2012).

Invention activities, in line with the problem-solving prior to instruction approach, are characterized by two sequential phases. First, learners are presented with contrasting cases, on the basis of which they are asked to solve a given problem. This activity aims to activate learners' prior knowledge, to raise learners' curiosity about the new topic, to promote learners' awareness of their own knowledge gaps and to enable visualization of deep features of the topic to be learned (Loibl et al., 2017; Wedde et al., 2021). Second, learners receive instruction on the new topic, which includes providing the canonical solution to the task (Schwartz et al., 2011).

Several studies have been conducted in which learners' task solutions were part of the evaluation. However, rather than these task solutions being analyzed in detail for their content, the studies investigated, for example, the matching number of items in the task solution with the canonical solution (Loibl & Rummel, 2014), the appropriateness of the task solutions (Glogger-Frey et al., 2022) or the students' answers depending on the topic to be learned (Wiedmann et al., 2012).

Presenting learners with contrasting cases may be used as a tool to foster student teachers' analytical competences, and hence their professional vision. Analytical competence is defined as the ability to perceive and evaluate the quality and learning effectiveness of observed classroom teaching (Plöger et al., 2020). In their study, Plöger et al. (2020) concluded that analytical competence consists of two dimensions, the content dimension, comprising pedagogical knowledge and content knowledge, and the formal dimension, referring to the 'complexity of information processing'. Drawn from this theoretical perspective, we divided the solution quality into two dimensions: analytical solution quality and content-related solution quality (Wedde et al., under review).

In another study, the analytical dimension of solution quality (see Figure 1) was assessed by addressing the question of how deep the student teachers' comparisons were on an analytical level (Wedde et al., under review). The present study focuses on the content-related dimension of solution quality, in connection with the question of what content-

related quality the student teachers' task solutions demonstrate in terms of professional vision of classroom management. There were two experimental conditions. One experimental group compared two contrasting auditive teaching examples about classroom management, in line with a worked solution, on the basis of given categories. The other experimental group, the invention activity, compared the auditive teaching examples using self-generated categories.

To assess content-related solution quality, the solutions of 149 student teachers were coded in terms of their naming of categories relevant to classroom management. The purpose of the evaluation is to provide insight into what students compared in their task solutions prior to receiving instruction on classroom management. Additionally, the question is addressed as to whether it is more beneficial for the content-related solution quality for students to work with the invention activity or the worked solution. Thus, conclusions on the quality of solution quality have been drawn, taking into account the results of analytical solution quality, which are presented in a further study (Wedde et al., under review).

Solution quality			
Analytical	Dimension	Content-related	
Depth of comparison		Professional vision of classroom management *Monitoring* *Rules & routines* *Lesson structure*	
Description		Recognition of	Surface features
Classification into categories			Deep features
Juxtaposition			
Summarization			Categories overall
Conclusion			
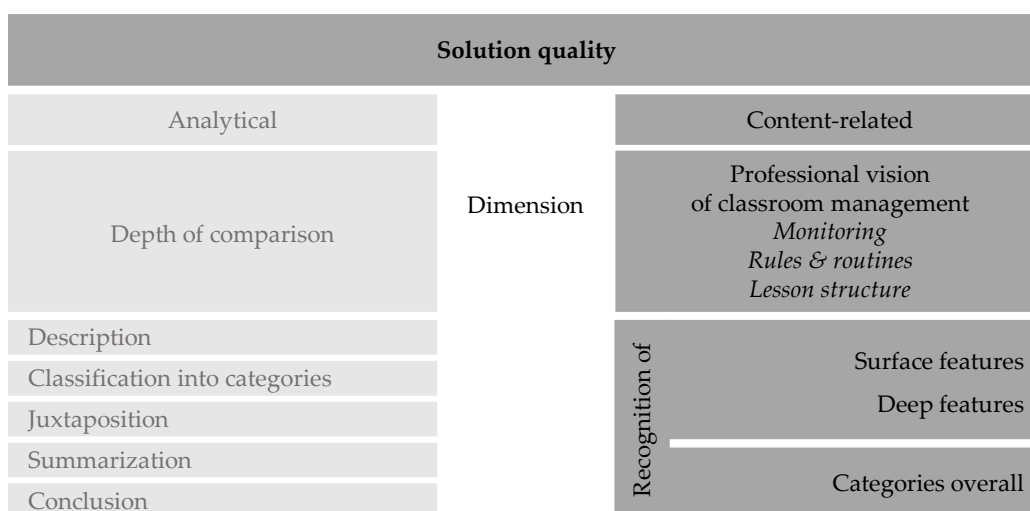
Figure 1. Construct of Solution Quality

Becoming a proficient classroom manager

From a theoretical point of view, classroom quality can be divided into emotional support, instructional support and classroom organization (Pianta et al., 2008). Emotional support relates to classroom climate and relationships within the classroom. Instructional support covers how teachers engage students' higher order thinking or the quality of teacher feedback. The dimension classroom organization reflects classroom management, the focus of this study.

Thus, we define classroom management as a teacher's actions in organizing a class and guiding classroom activities with the goal of maximizing active learning time and creating a classroom climate that facilitates academic and social-emotional learning (Evertson & Weinstein, 2006; Kunter & Voss, 2013). As key aspects for authentic

relationships between students and teachers mutual trust and respect may be considered prerequisites for successful classroom management (Hammond, 2014). In addition to establishing a supportive and caring relationship with learners, the teacher is also responsible for organizing instruction to initiate effective learning processes and for preventing or responding appropriately to classroom disruptions (Evertson & Weinstein, 2006). Thus, classroom management is considered not only as behavioral but also as a support function of instruction (Martin & Sass, 2010). In particular, classroom management strategies focus on preventing disruptions. Consequently, classroom management has a significant positive impact on student achievement and promotes learners' social and emotional development (Kunter & Voss, 2013; Seidel & Shavelson, 2007).

Following Gold et al. (2020), classroom management may be categorized into three facets: *monitoring*, *rules & routines* and *lesson structure*. *Monitoring* includes the strategies withitness and overlapping (Kounin, 1970). Withitness refers to the teacher giving students the impression that they have an overview of everything occurring in the classroom. Overlapping describes the ability to engage in parallel actions in the classroom by maintaining an activity. Effective *monitoring* also involves praising students' positive behaviors and thus does not focus on negative behaviors. If classroom disruptions occur, the teacher can either ignore them or ensure that they are dealt with quickly, briefly and without a great deal of attention (Landrum & Kauffman, 2006; Simonsen et al., 2008).

Rules & routines are used for organized activities and for practicing routinized forms of learning (Emmer et al., 1980). The teacher should regularly recall established rules and note that different rules and routines are significant for different phases of instruction. *Lesson structure* refers to the design of transitions between different phases and activities as well as to managing instruction and activities. Kounin (1970) described the techniques smoothness and maintaining a momentum, meaning the ability of a teacher to organize and create smooth transitions and an activity flow. Further elements considered essential for an effective classroom management are clear instructions and presentations of the topics to be learned in terms of a structured learning environment and appropriate lesson planning including appropriate time management and transparency of the conducted lesson (Emmer et al., 1994; Evertson et al., 2006).

Young teachers often face difficulties in applying effective classroom management strategies. These difficulties also impact teachers' health (Chaplain, 2008). Thus, it is essential to foster student teachers' professional vision of classroom management as early as possible. With a professional vision of classroom management, teachers are able to perceive classroom management-related events in a timely manner and respond to the incidents in a situationally appropriate way (Gold et al., 2020). Thus, professional vision describes the ability to identify events that promote and hinder learning (noticing) as well as to interpret them in a theory-based manner (knowledge-based reasoning) in order to be able to react to them accordingly (Seidel & Stürmer, 2014; Sherin, 2007). These two knowledge-based interrelated sub-processes are part of a teacher's professional competence

(Sherin, 2007) and are considered learnable (Stürmer, Seidel, & Schäfer, 2013). Applying these two sub-processes requires teachers to possess conceptual and declarative knowledge (König et al., 2014; Stürmer, Könings, & Seidel, 2013). A teacher's professional vision is related to student learning (Kersting et al., 2012).

Teaching can be characterized by multidimensionality, simultaneity, immediacy, unpredictability, publicness and history (Doyle, 2013). Thus, teaching is a cognitively demanding activity, which is why novices and experts differ in their professional competence and professional vision (Berliner, 2001; Bromme, 2001; Carter et al., 1988). Empirical studies have shown that experts are able to draw on elaborated, networked and retrievable schemata as well as on specific case knowledge (Berliner, 2001; Borko & Livingston, 1989; Carter et al., 1988). Since novices are still developing these schemas and have yet to acquire specific case knowledge, they often have difficulties noticing important events in the classroom and distinguishing them from unimportant events. They tend to refer to superficial features instead of perceiving significant features related to teaching (Star et al., 2011; van den Bogert et al., 2014). Novices are more likely to perceive students' disciplinary behavior and demeanor, whereas experts refer to a learner's learning processes and actions that promote learning (Wolff et al., 2015; Wolff et al., 2017). Hence, developing a professional vision of classroom management necessitates student teachers gaining situational, i.e., case knowledge (Berliner, 2001), and declarative and conceptual knowledge about classroom management (Gold et al., 2020).

Use of contrasting cases in teacher education

From an empirical perspective, the effectiveness of training to promote professional vision among student teachers has been widely demonstrated, often using videos (Barnhart & van Es, 2015; Gold et al., 2020; Stürmer, Seidel, & Schäfer, 2013). These trainings have in common that learners first receive instruction before they analyze cases. Although it is known that the analysis of constructed videos promotes the acquisition and transfer of theoretical knowledge among student teachers (Anderson & Lignugaris/Kraft, 2006; Moreno & Valdez, 2007), few studies have been conducted on constructed video cases in teacher education. One advantage of constructed cases is that theoretical principles can be clearly outlined in the examples, which can also contrast specific behaviors related to a concept in the cases. This contrast can be particularly effective for novices, as it makes expert practices more recognizable by contrasting them with problematic teacher practices (Piwowar et al., 2018). By presenting a problematic case, students may also develop negative knowledge, i.e., knowledge of how something does not work (Oser et al., 2012).

A study conducted with student teachers to examine the effect of contrasting videos showed that the control group, who were only shown the same video case twice, demonstrated higher conceptual understanding than the student teachers who were shown two contrasting video cases with different instructional methods (Nagarajan et al., 2004). In an additional study, the researchers found that support in the form of guiding questions

was beneficial in analyzing contrasting cases (Nagarajan & Hmelo-Silver, 2006). Another study used written physical education teaching examples to examine the effect of comparison. One group received "good" examples, another received only "problematic" examples and the third group received "problematic" examples in addition to the "good" examples. The third group achieved the best results in terms of lesson planning skills and the development of constructivist beliefs (Heemsoth & Kleickmann, 2018).

To date, no studies have examined the potential of auditive case comparison to promote the professionalization process of student teachers. Therefore, this study focuses on comparing two constructed contrasting auditive teaching examples. The following advantages are assumed for the use of constructed contrasting auditive teaching examples:

- A focus on the communicative actions of teachers: Through the auditive perception, the focus is particularly directed to the verbal level of classroom management. In this way, students first learn verbal strategies of classroom management before acquiring nonverbal strategies.

- A reduction of complexity: According to the cognitive theory of multimedia learning, to analyze audiovisual information such as classroom videos, learners process information through both the visual and auditory channels in working memory (Mayer, 2009). If auditive teaching cases are used, the information is mostly processed through the auditory channel. Proficient readers are also able to process information in the auditory channel first, but they are able to form a mental image from listening, which is then processed in the visual channel (Mayer, 2009). Although the modality principle in multimedia learning argues that limited capacity in working memory makes it more effective to present information using both the visual and auditory channels (Low & Sweller, 2009), this argument may not be fully transferable to student teachers acquiring analytical competence. The visual component in videos does not necessarily improve a novice's comprehension process, rather it adds another component to the complexity of the case to be analyzed. Novices may quickly suffer cognitive overload when analyzing videos as they cannot cognitively process the large amount of information they are confronted with in videos at the same pace as it is presented (Erickson, 2007). Thus, effective learning processes is more likely to be hindered. Similarly, Syring et al. (2015) showed that videos induced higher extrinsic cognitive load and cases presented as text induced lower extrinsic cognitive load among student teachers. Our studies showed that students experienced relatively low extrinsic and intrinsic cognitive load after comparing auditive cases (Wedde et al., under review, 2021). Therefore, to facilitate the competence acquisition process, auditive cases are used to direct student teachers' attention to essential information.

- More motivating than text: The use of text and video as cases has been studied in terms of motivational-emotional processes related to student teachers' learning.

Video cases were found to induce higher immersion and enjoyment among students during learning (Syring et al., 2015). Thus, for the present study, we assumed that auditive cases may be more motivating than cases presented as text at lower cognitive load since auditive teaching cases, for example, also raise learners' curiosity about the topic to be learned (Wedde et al., 2021). For example, it is easier to convey emotions via auditory media than via written case descriptions since emotions are transmitted more via the voice, volume and expressions of the person speaking (Häusermann, 2010).

- Contrast through design: The contrast between two cases is evident due to the variation of a concept's deep features. Surface and less significant features can be held the same while significant features of a concept can be varied in constructed teaching examples to direct the focus to deeper features of a concept. This allows a concept's features to be better illustrated and elaborated. Therefore, students may be able to clearly notice the contrast between the successful example, i.e., actions of an expert teacher, and the less successful example, i.e., actions of an inexperienced teacher (Piwowar et al., 2018). In our examples, deep features of classroom management, e.g., dealing with disruptions, were intentionally varied while surface features irrelevant for the task solution, e.g., the topic of instruction, remained the same. According to the expertise paradigm, experts are known to tend to categorize problems on the basis of deep features and novices to tend to categorize them on the basis of surface features (Chi et al., 1981).

While there have already been some evaluated trainings that specifically promoted student teachers' professional vision, only a few have focused on professional vision of classroom management (Barth, 2017; Gold et al., 2020). These research projects have in common that the professional vision of classroom management was surveyed or promoted using a video-based approach. The current project focuses on promoting professional vision of classroom management by comparing two contrasting auditive teaching examples. The comparison of contrasting teaching examples was investigated as a task format to promote the acquisition of a professional vision of classroom management among novices.

Use of different tasks for comparative activities: Invention activities and worked solutions

Invention activities are considered an effective learning method for acquiring conceptual knowledge (Loibl et al., 2017), which, along with declarative knowledge, is the basis for professional vision (König et al., 2014; Stürmer, Könings, & Seidel, 2013). To date, there have been no studies that have investigated this learning format in teacher education, on the topic of classroom management, or with a focus on the comparison process. Schwartz et al. (2011) showed in their study with eighth graders that, by working with contrasting cases in an invention activity, the deep structure of the concept to be learned is more likely to be remembered and to be applied in transfer. Students who learned in the experimental

condition with direct instruction tended to only recall surface features without acquiring conceptual understanding.

Inventions activities have been particularly studied in science, mathematics and school-based settings to evaluate their learning effectiveness. Most of the studies used contrasting cases that differed only in one feature (e.g. Loibl & Rummel, 2014). Worked solutions have often been contrasted with invention activities in research studies. There is evidence that worked solutions lead to better learning outcomes, especially for novices, due to lower cognitive load (Kirschner et al., 2006). In accordance with the assumptions of cognitive load theory, a lower cognitive load in the worked solution format is considered to be more likely to enable the acquisition of new knowledge than the higher cognitive load in the invention activity (Sweller et al., 1998). Our studies showed no significant difference between the two experimental conditions in terms of extrinsic cognitive load (Wedde et al., 2021); however, a significant difference was found between the two experimental groups in terms of intrinsic cognitive load, with invention activity students perceiving higher intrinsic cognitive load than the experimental condition of worked solution (Wedde et al., under review).

To date, studies have shown a mixed picture on the question of whether a high quality of task solutions also leads to better learning outcomes in the posttest or transfer. The assumption would be that learners who already found more deep features of the topic to be learned during working on the task would need to focus on fewer aspects during instruction. This approach would facilitate learning (Loibl & Rummel, 2014; Roll et al., 2011). Although the quality of the solution attempts differed significantly between the groups that worked with and without contrasting cases, the group with contrasting cases achieved a higher solution quality and better results in terms of conceptual knowledge. However, another finding of that study was that the quality of solution attempts of learners who worked with contrasting cases did not correlate with their posttest scores. In contrast, the quality of the solution attempts of the other experimental group, which worked without contrasting cases, correlated with their results in the posttest (Loibl & Rummel, 2014).

Research questions

This study examined the content-related solution quality relating to professional vision of classroom management. The aim is to clarify what the students of the two experimental conditions, worked solution (comparing by using given categories) and invention activity (comparing by using of self-generated categories), perceived and drew on when they solved the task of comparing two teaching examples without having received instructions on classroom management.

To fulfil the main research goal, the following research questions were drawn up:

1: In terms of classroom management, which categories are perceived from the two teaching examples by the students in the two experimental conditions and how often are these categories perceived?

2: How do the two experimental conditions differ in terms of naming *surface* and *deep features*?

3: How many categories do students refer to on average in their solutions?

4: Do students tend to mention categories from the successful (teaching example 2) or from the less successful auditive teaching example (teaching example 1)?

5: Is there a correlation between the content-related solution quality and the analytical solution quality?

The first research question is aimed at providing information about which categories were how often addressed on average by both experimental groups (RQ 1). The individual categories of the coding manual were additionally divided into *surface* and *deep features* to investigate the question of the extent the students already perceived deeper features of classroom management. The answer should indicate the teacher students' conceptual understanding of classroom management (RQ 2). Another aspect relevant to content-related solution quality is the average number of categories used in both experimental conditions (RQ 3). It was assumed that the students in the worked solution experimental condition would, on average, use more categories to compare the two auditive examples. Additionally, we asked whether students were more likely to identify aspects of classroom management in the less successful or in the more successful teaching example (RQ 4). Finally, the results on analytical solution quality were included (RQ 5) to allow conclusions on the overall solution quality to be drawn (see Figure 1).

METHOD

Sample

149 student teachers in the introductory phase of their studies at the University of Kassel participated in this study (65.8% female). This subsample was drawn from the total sample (N = 265). Only cases for which data on the content-related solution quality and analytical solution quality were available were selected from the total sample. The participants were randomly assigned almost equally to the two experimental conditions: 76 students worked on the invention activity (IA) (67.1% female; age: M = 22.3, SD = 4.85) and 73 solved the worked solution (WS) (64.4% female; age: M = 21.4, SD = 4.80).

Research design and treatment

The experimental study was conducted in an introductory lecture, accompanied by 15 tutorials, in educational science of the student teacher program during the winter term 2020/21. Due to the COVID-19 pandemic, the course was held online via video conferencing.

First, students in both experimental groups compared both auditive teaching examples in a tutorial session at the beginning of the semester. Second, during the lecture one week later, the students received instruction on the topic of classroom management as well as on the canonical solution to the assignment. Two auditive teaching examples in which excerpts from constructed lesson sequences were audible were used as contrasting cases. The auditive teaching examples were framed by a narrator and presented as podcasts. The first auditive teaching example represented a less successful application of classroom management strategies by a teacher, the second auditive teaching example a more successful case. One half of all students were given the IA as an assignment to compare the two teaching examples while the other half worked with the WS. As a first step of the assignment, both experimental groups listened to the two contrasting auditive teaching examples. Subsequently, IA students developed categories by which they could assess the quality of classroom management in both teaching examples. Using these categories, they were asked to compare the two examples. In contrast, WS students were given a set of categories to compare the two examples (i.e., managing transitions, rules, routines, communication by the teacher and managing disruptions).

Instruments

Content-related solution quality

The categories of the content-related solution quality (see Table 1) were deductively developed on the basis of the theoretical concepts of classroom management and the two teaching examples as well as inductively on the basis of the students' task solutions. The categories were assigned to these three facets of classroom management: *monitoring, rules & routines, lesson structure*. These categories of the three facets were coded in the task solutions using qualitative content analysis by Mayring (2015). Qualitative content analysis is characterized by a systematic procedure that aims to assess or even evaluate the cases to be analyzed on the basis of selected categories (Mayring, 2015). Categories were coded using analytic scoring (Schipolowski & Böhme, 2016). For this purpose, the individual solutions were examined to determine whether the individual categories for teaching example 1 (TE1) and teaching example 2 (TE2) were identified. If a category was mentioned for one of the two teaching examples, the value "1" (mentioned) of this category was assigned to the respective teaching example.

The value "0" (not mentioned) was given if a category of an example was not addressed in a solution. This process assigned all categories to the respective teaching example. Due to the heterogeneity of solutions, they were coded consensually by two trained coders and, following the codings, agreement was reached in the case of non-matching values (Guest et al., 2011). Thus, this approach can also be considered reliable. From this agreement, sum scores were generated and the variables may therefore be considered interval-scaled.

Table 1

Facets & Categories of the Content-Related Solution Quality

Facet	SF / DF	Category	TE	Description This category means that …
Monitoring	SF	Communication & behavior of the teacher	TE1	… the teacher often appears annoyed and emphasizes the misbehavior of the students.
			TE2	… the teacher communicates in a friendly yet decisive manner and praises desirable behavior.
	DF	Dealing with disruptions	TE1	… the teacher does not manage to maintain a flow through her disruptive interventions.
			TE2	… the teacher is able to keep a flow through purposeful, undramatic actions.
		Support for students	TE1	… the teacher does not provide individual assistance.
			TE2	… the teacher offers individual assistance.
		group focus	TE1	… the teacher does not actively involve students during the lesson.
			TE2	… the teacher actively involves students during the lesson.
Rules & routines	SF	Existence of rules & routines	TE1	… there are little or no established rules & routines.
			TE2	… rules & routines are established.
	DF	Linking instructions and rules	TE1	… rules for individual instructional phases are not present.
			TE2	… rules are established for each instructional phase.
		Reminder of rules	TE1	… the teacher only reminds students of rules by admonishing them.
			TE2	… the teacher reminds of the rules at the beginning of the lesson.
		Applying routines	TE1	… the teacher does not apply routines and there is no routinized procedure.
			TE2	… the teacher applies routines and there is a routinized procedure.
Lesson structure	SF	Instructional structure	TE1	… the lessons seem rather disorganized.
			TE2	… the lessons seem very well-structured.
	DF	Clarity of content	TE1	… the lesson planning is not made clear and transparent.
			TE2	… the lesson planning is very clear and transparent.
		Repetition of content	TE1	… there is no reference back to the past lesson.
			TE2	… there is a reference back to the past lesson.
		Transitions	TE1	… there are no smooth transitions.
			TE2	… there are smooth transitions.

Note: SF = surface feature, DF = deep feature, TE = teaching example

In line with IA allowing students to identify more *deep features* of the subject to be learned (Schwartz et al., 2011), the categories were additionally grouped into *surface* and *deep features* (see Table 1). The *surface features* refer to behavioral and well audible features, such as the teacher's communication. It is assumed that the *surface* features have undifferentiated, less complex features of classroom management requiring a lower level of conceptual understanding. To address essential aspects of classroom management, the recognition of *deep features* is required, which implies a conceptual understanding. *Deep*

features relate to students' instructional and learning processes or how the teacher interacts with students, such as the teacher's intervention during disruptions. Such aspects are likely to be more complex and more difficult to observe (Kunter & Voss, 2013). Each aspect of the *surface* features was summarized in a single variable, just as the aspects of the *deep features* were summarized in a single variable for each facet.

The individual categories of the three facets are named and described in Table 1. More superficial and easy audible features such as teacher communication and behavior, the existence of rules & routines and instructional structure were defined as *surface features*. All other features were assigned to the *deep features*. The descriptions show that the characteristics of TE1 represent more negative and less successful teacher actions and techniques of classroom management and that the successful implementation of the respective strategies are to be found for TE2. To assess the content-related solution quality, *surface features* and *deep features* and the number of categories mentioned by the students were evaluated.

Analytical solution quality

In another study about the solution quality of WS and IA, we constructed the analytical solution quality (see Figure 1), which represents the modeled comparison process. It consists of the following five steps: Description, classification into categories, juxtaposition, summarization and conclusion. The result of that study indicated that WS students demonstrated a significantly higher analytical solution quality than did IA students. However, the overall sample achieved only a low analytical solution quality (Wedde et al., under review).

Data analysis

For the categories and variables used, absolute and relative frequencies, means, sum scores and standard deviations were calculated. To examine the differences between the two experimental groups, independent-samples *t*-tests were performed with a defined significance level of α = .05. The experimental condition (IA or WS) represents the independent variable and the variables of the content-related solution quality the dependent variable. In addition, Pearson's correlations were calculated between the analytical solution quality, operationalized by the depth of comparison scale, and the variables of the content-related solution quality.

RESULTS

The first research question, concerning which categories students perceived and how frequently they were perceived from the two contrasting teaching examples, is covered first. Table 2 lists the frequencies of the three facets including the individual categories.

Table 2 shows that, for TE1, the WS students most frequently referred to the *monitoring* categories. For TE2, the WS students frequently referred to the *rules & routines*

categories in addition to the *monitoring* categories. Although the WS group was provided with categories to compare, they were not used by the entire experimental group to compare the two examples: transitions (TE1: 66%, TE2: 58%), existence of rules and routines (TE1: 70%, TE2: 68%), communication and actions of the teacher (TE1: 82%, TE2: 82%), dealing with disruptions (TE1: 77%, TE2: 55%). The individual given categories were used slightly more often for TE1 than for TE2.

For TE1, IA students also frequently referred to *monitoring*. In particular, they mentioned categories such as communication & behavior of the teacher (49%) and dealing with disruptions (36%). As in TE1, *monitoring* was also frequently discussed by students in the experimental condition IA for TE2. However, the students were less likely to address dealing with disruptions (26%), yet over half of the experimental condition continued to address communication & behavior of the teacher (53%). Other categories that some IA students addressed for comparing the two teaching examples were existence of rules & routines (TE1: 30%, TE2: 33%), instructional structure (TE1: 16%, TE2: 22%) and clarity of content (TE1: 14%, TE2: 26%). It is noteworthy that IA students addressed these categories more frequently for TE2 than for TE1.

Table 2

Frequencies of the coded Facets and associated Categories of Classroom Management

Facet	SF / DF	Category	Teaching example 1 Less successful classroom management strategies						Teaching example 2 Successful classroom management strategies					
			WS		IA		Overall		WS		IA		Overall	
			n	%	n	%	n	%	n	%	n	%	n	%
Monitoring	SF	Communication & behavior of the teacher	60	82	37	49	97	65	60	82	40	53	100	67
	DF	Dealing with disruptions	56	77	27	36	83	56	40	55	20	26	60	40
		Support for students	3	1	2	3	5	3	25	34	18	24	43	29
		Group focus	7	10	7	9	14	9	8	11	9	12	17	11
		total	**126**	/	**73**	/	**199**	/	**133**	/	**87**	/	**220**	/
Rules & routines	SF	Existence of rules & routines	51	70	23	30	74	50	50	68	25	33	75	50
	DF	Linking instructions and rules	1	1	3	4	4	3	14	19	3	4	17	11
		Reminder of rules	9	12	1	1	10	7	28	38	7	9	35	23
		Applying routines	10	14	4	5	14	9	46	63	10	13	56	38
		total	**71**	/	**31**	23	**102**	/	**138**	/	**45**	/	**183**	/
Lesson structure	SF	Instructional structure	13	18	12	16	25	17	12	16	17	22	29	19
		Clarity of content	9	12	11	14	20	13	24	33	20	26	44	30
	DF	Repetition of content	2	3	1	1	3	2	18	25	5	7	23	15
		Transitions	48	66	5	7	53	36	42	58	8	11	50	34
		total	**72**	/	**29**		**101**	/	**96**	/	**50**	/	**146**	/
		total	**269**	/	**133**	/	**402**	/	**367**	/	**182**	/	**549**	/

Note: SF = surface feature, DF = deep feature; WS: *n* = 73, IA: *n* = 76, Overall: *N* = 149

The assignment of all categories to *surface* and *deep features* will be used to examine how frequently students addressed these different features of classroom management (RQ 2). In addition to the absolute and relative frequencies (see Table 2), sum scores were calculated for the *surface* and *deep features* for each facet (see Table 3): WS students named more *surface* and *deep features* on average than IA students (except for the *surface feature* of *lesson structure*). However, the entire sample remained low in *surface* and *deep features* recognition in their task solutions.

Overall, there was a high significant difference with regard to addressing the *surface features* of *monitoring* ($t(138.76) = 4.85$, $p < .001$, $d = 0.80$) as well as those of *rules & routines* ($t(147) = 5.54$, $p < .001$, $d = 0.83$). There was no significant difference between the two experimental conditions for the recognition of *surface features* for *lesson structure* ($t(147) = -0.36$, $p = .72$). The WS experimental group addressed *surface features* on *monitoring* and *rules & routines* more often than the IA group. Regarding *lesson structure*, there was little difference between the experimental conditions.

For the *deep features*, highly significant differences associated with a strong effect were shown between the two experimental conditions for *monitoring* ($t(147) = 4.28$, $p < .001$, $d = 1.16$), for *rules & routines* ($t(127.21) = 7.86$, $p < .001$, $d = 0.86$) and for *lesson structure* ($t(147) = 7.10$, $p < .001$, $d = 1.12$). Overall, for the *deep features,* the WS students on average addressed more *deep features* for the three facets than did the IA students. However, the WS students also remained in the bottom third of the score for addressing *deep features*.

Table 3

Descriptive Statistics of the Surface and Deep Features

		WS	IA	Overall
Facet	**Features**	*M* (*SD*)	*M* (*SD*)	*M* (*SD*)
Monitoring	Surface	1.64 (0.67)	1.01 (0.90)	1.32 (0.86)
	Deep	1.90 (1.11)	1.09 (1.20)	1.49 (1.22)
Rules & routines	Surface	1.38 (0.81)	0.63 (0.85)	1.00 (0.91)
	Deep	1.48 (1.00)	0.37 (0.69)	0.91 (1.02)
Lesson structure	Surface	0.34 (.67)	0.38 (0.67)	0.36 (0.67)
	Deep	1.96 (1.28)	0.66 (0.93)	1.30 (1.29)

Note: For surface features, 0 to 2 points can be scored for each of the three facets; for deep features, 0 to 6 points can be scored for each of the three facets. WS: $n = 73$, IA: $n = 76$, Overall: $N = 149$

In total, the WS students used considerably more categories in their comparison (RQ 3, see Figure 2). On average, WS students mentioned 3.68 (*SD* = 1.43) categories TE1 and 5.03 (*SD* = 2.13) for TE2. In contrast, IA students used fewer categories for their comparison: They mentioned on average 1.75 (*SD* = 1.60) categories for TE1 and 2.39 (*SD* = 1.83) categories for TE2.
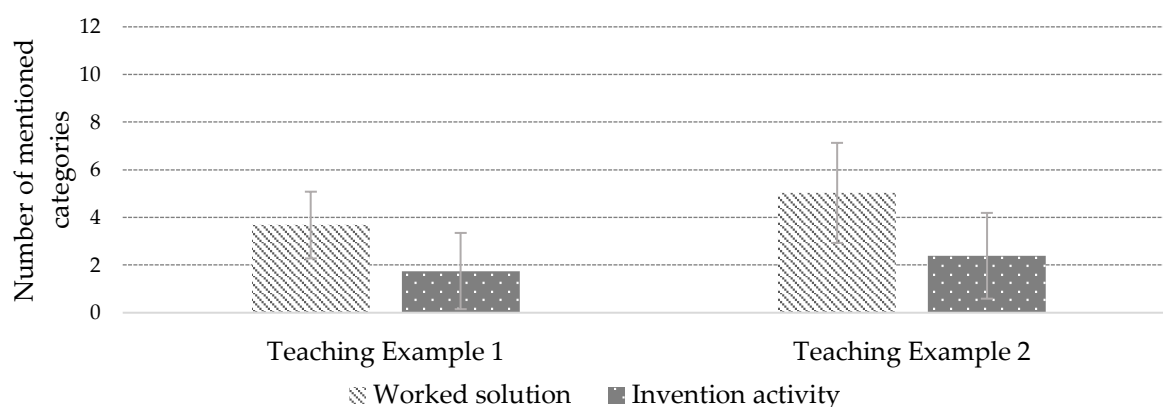

Figure 2. Mentioned Categories per Experimental Condition for both Teaching Examples

For the fourth research question, both experimental groups identified more categories for TE2 than for TE1. There was a significant difference with a strong effect between the two experimental conditions in terms of the number of categories used for TE1 ($t(147) = 7.76$, $p < .001$, $d = 1.52$) and for TE2 ($t(147) = 8.1$, $p < .001$, $d = 1.98$).

Research question 5 investigated to what extent the analytical and the content-related solution quality were interrelated. For this purpose, Pearson correlations were calculated with the variables depth of comparison scale, the number of categories mentioned, as well as the *surface* and *deep features*. There were highly significant strong positive correlations (one-tailed) between the variable depth of comparison and the number of categories named and the *surface* and *deep features* for the overall sample (see Table 4). The greater the depth of comparison, the more aspects were mentioned in the comparison. In addition, more *surface* and *deep features* were named. The correlations between the individual variables of the content-related solution quality (number of mentioned categories, *surface* and *deep features*) were highly significant medium to strongly positive.

Table 4

Intercorrelations between the Variables of Analytical and Content-Related Solution Quality

Variable	1	2	3	4
1. Depth of comparison	-			
2. Number of mentioned categories	.65***	-		
3. Surface features	.53***	.80***	-	
4. Deep features	.60***	.93***	.54***	-

Note: * $p < .05$, ** $p < .01$, *** $p < .001$; For the depth of comparison and the variables of content-related solution quality, the correlations were tested one-sided. The correlations between the variables of content-related quality were tested two-sided.

DISCUSSION

The purpose of this study was to assess the content-related solution quality of IA and WS by evaluating student teachers' task solutions. Overall, it appeared that WS students referred most frequently to *monitoring* categories for TE1 and similarly frequently to *monitoring* and *rules & routines* categories for TE2. The IA students most frequently addressed *monitoring* categories in both teaching examples. For the *surface* and *deep features*, the WS and IA were found to differ highly significantly at a strong effect with respect to all facets of the *surface* and *deep features* except for naming the *surface features* for *lesson structure*. For the most part, the experimental group WS named more *surface* and *deep features* than the experimental group IA. Similarly, it was evident that both experimental groups used more categories for TE2 than they did for TE1. However, WS students overall mentioned more categories than IA students. For the overall sample, the relationship between the analytical and content-related solution quality was medium to strong. A study by Plöger et al. (2020) already indicated that analytical competence consists of two dimensions; the formal dimension, i.e., the 'complexity of information processing', and a content dimension, i.e., pedagogical knowledge and content knowledge.

From the results of this study, it may be concluded that the WS students demonstrated a higher quality of content in their solutions. Thus, first-year student teachers

achieve a higher quality in terms of content-related solution quality when they receive more support during working on the WS task. This result is consistent with previous studies showing, for example, that support in the form of guiding questions is more goal-oriented when analyzing and interpreting contrasting cases (Nagarajan & Hmelo-Silver, 2006).

Studies on professional vision have shown that novices are more likely to relate to students' disciplinary behavior (Wolff et al., 2015). This finding was also reflected in our results, in that students in both groups most often referred to the teacher's *monitoring*, and thus, for example, to the teacher's dealing with disruptions. That the other two facets were perceived less may also be a result of them being less noticed in auditive cases. However, importantly, our results showed that the students were not able to perceive many of the key events and thus they did not perceive significant features of effective classroom management. The finding corresponds to research on professional vision of novices, who are often not able to distinguish significant from less significant features (Star et al., 2011). It clearly shows that, for the implementation of task formats using the problem-solving prior to instruction approach, it is necessary to implement the instruction as well. During the instruction, any missing declarative and conceptual knowledge that is not present in the problem-solving phase must be introduced (König et al., 2014; Stürmer, Könings, & Seidel, 2013).

In further studies, students could compare contrasting cases, focusing on classroom management a second time after instruction. These further studies would permit a cross-check on the extent to which students then also include the other two facets, *rules & routines* and *lesson structure*, in their task solution. Interestingly, studies that assessed the professional vision of classroom management through a video-based online test showed that, before an intervention, novices perceived the *monitoring* facet less than the other two facets (Junker et al., 2021; Weber et al., 2018). That finding may indicate that the auditive teaching examples particularly bring into focus the *monitoring* facet. This facet is also reflected in the way the teacher communicates. Certain strategies are brought into focus more through the visual channel, others through the auditive channel. To reduce the complexity of an analysis and to practice only the analysis of certain strategies, videos or purely auditive examples could be selected accordingly. If monitoring strategies are to be focused on, auditive examples could be compared. To analyze lesson structure strategies or rules and routines, videos could be used in addition to auditive lesson examples. However, this approach requires verification in further studies.

By comparison, the fact that both experimental conditions used more categories for TE2 shows that the students are better able to perceive aspects of classroom management on the basis of a successful rather than a problematic teaching example. This finding indicates that the students lacked the necessary knowledge to determine which aspects of professional teacher action regarding classroom management were not implemented in the less successful implementation.

Knowing that strategies have not succeeded or are not being implemented requires knowledge about those strategies. Hence, the students probably had no negative knowledge about classroom management (Oser et al., 2012). Due to the successful illustration in TE2, the students could identify successful aspects of the teacher's actions. By comparing the two examples, at best, students conclude for their own teaching practice which classroom management strategies are effective for professional teaching. Yet, one of our studies showed that the students did not draw any conclusions from their comparisons and even, in rare cases, merely summed up which example showed the more successful implementation (Wedde et al., under review). The observation that WS students scored higher in terms of using both *deep features* and *surface features* shows that the support in WS helps students to discover *deep features* of classroom management during the comparison process. However, it was also found that the entire sample recognized few *deep features* on average, suggesting that, as novices, they generally have difficulty distinguishing significant from insignificant features and in perceiving the important events in class in their multiplicity (Star et al., 2011; van den Bogert et al., 2014). Thus, it can be assumed that the students have only a poor conceptual understanding of classroom management.

Explaining all important *deep features* during the subsequent instruction in the second phase of the IA requires reviewing the extent to which the solution attempts of WS and IA differ from each other. The evaluation indicated that the WS group already discovered some *deep features* of classroom management through the problem-solving phase. In contrast, the IA group perceived fewer *deep features* during this phase. It may be assumed that WS students have a facilitated learning process for acquiring conceptual knowledge during the instruction because they have fewer features to add to the concept of classroom management (Loibl & Rummel, 2014; Roll et al., 2011).

Although our evaluations of content-related solution quality found that support in form of the WS led to better results in the students' solutions, it is yet unclear whether this would also lead to better learning outcomes (Loibl & Rummel, 2014; Wiedmann et al., 2012). This question will be answered in a further study. The first-year student teachers' solutions indicated that WS is the preferable learning format in terms of comparing constructed contrasting auditive lesson examples. In the future, it would be useful to examine how these results can be replicated among students in higher level semesters or even among beginning teachers.

This study contributes to the sparse research on invention activities and worked solutions in teacher education. In particular, contrasting cases could be an innovative task format to initiate skills related to professional vision. Evaluating task solutions at the content level is essential to understanding what aspects of effective classroom management students initially focus on when comparing contrasting cases. Professional vision is commonly assessed using standardized video tools. We added value by evaluating non-standardized analyses, allowing us to reflect the range of classroom management strategies students

notice. Furthermore, our study supports earlier findings (König et al., 2014; Stürmer, Könings, & Seidel, 2013) that analyzing teaching scenes requires professional knowledge.

Overall, this study provides valuable insights for teacher education research. It appears that, during the problem-solving phase, support in the form of a worked solution is more effective than an invention activity. The worked solution supports students in relating to the significant strategies of classroom management and focuses on learning-related events. It remains to be verified to what extent this result can be replicated after instruction.

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