BUEFAD | January 2023, Volume 12, Issue 1
Bartın University Journal of Faculty of Education
International Refereed Journal
dergipark.org.tr/buefad

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Bartın University Journal of Faculty of Education (e-ISSN 1308-7177) is an online, open-access, free of charge, international and refereed journal which is published by Bartın University Faculty of Education. Scientific articles conducted in various areas of research in teaching and related disciplines which have a general place in the community are published in the journal. The journal provides a platform for the publishing of studies in the fields of; learning, teaching and education.

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Bartın University Journal of Faculty of Education

BUEFAD

2023, Volume 12, Issue 1, 1-15
dergipark.org.tr/buefad
DOI: 10.14686/buefad.908259

Investigation of Secondary School Students' Strategies for Solving Routine and Non-Routine Problems

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Research Article
Received: 02.04.2021
Revised: 04.04.2022
Accepted: 26.05.2022

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ABSTRACT

The aim of this study is to determine the situations of secondary school students in solving routine and non-routine problems and the strategies they use while solving these problems. The research is in the survey model, and the sample of the study consists of 430 students studying in the 6th, 7th, and 8th grades of two official secondary schools by homogeneous sampling which is one of the purposeful sampling methods. Routine and non-routine problem test and problem evaluation rubric were used as data collection tools in the study. As a result of the research, it was concluded that students were more successful in routine problems and these students mostly used arithmetic strategies in solving routine and non-routine problems. Moreover, it was revealed that students used the equation strategy in solving routine problems, and the guess and check strategy in solving non-routine problems. As a result of the study, it showed that non-routine problems should be included more in the classroom and textbooks in mathematics lessons. In addition, it was concluded that students never used drawing, make a list, logical reasoning strategies in the process of problem-solving, but never using the strategies of finding a pattern, elimination, and working backwards.

Keywords: Routine problem, non-routine problem, problem-solving strategies, mathematics, secondary school students

Ortaokul Öğrencilerinin Rutin ve Rutin Olmayan Problemleri Çözme Stratejilerinin İncelenmesi

ÖZ

Bu araştırmanın amacı, ortaokul öğrencilerinin rutin ve rutin olmayan problemleri çözme durumlarını ve bu problemleri çözerken kullandıkları stratejileri belirlemektir. Araştırma tarama modelindedir. Araştırmanın örneklemini, amaçlı örnekleme yöntemlerinden homojen örnekleme ile belirlenen 6., 7. ve 8. sınıflarında öğrenim görmekte olan toplam 430 öğrenci oluşturmaktadır. Araştırmada veri toplama aracı olarak rutin ve rutin olmayan problem testi ve problem değerlendirme rubriği kullanılmıştır. Araştırmada öğrencilerin rutin problemlerde daha başarılı oldukları ve öğrencilerin rutin ve rutin olmayan problemlerin çözümünde en çok aritmetiksel strateji kullandıkları sonucuna ulaşılmıştır. Ayrıca rutin problemlerin çözümünde öğrencilerin denklem kurma stratejisini kullanırken rutin olmayan problemlerin çözümünde ise tahmin kontrol stratejisini kullandıkları ortaya çıkmıştır. Çalışmanın sonucunda matematik derslerinde rutin olmayan problemlere sınıf içerisinde ve ders kitaplarında daha fazla yer verilmesi gerekliliği ortaya çıkmıştır. Ayrıca öğrencilerin çizim yapma, sistematik liste yapma, mantıksal akıl yürütme stratejilerini problem çözme sürecinde kullanmakla beraber bağıntı bulma, eleme ve geriye doğru çalışma stratejilerini hiç kullanmadıkları sonucuna ulaşılmıştır.

Anahtar kelimeler: Rutin problem, rutin olmayan problem, problem çözme stratejileri, matematik, ortaokul öğrencileri

To cite this article in APA Style:

Or, M. B. & Bal, A. P. (2023). Investigation of secondary school students' strategies for solving routine and non-routine problems. *Bartın University Journal of Faculty of Education, 12*(1), 1-15. https://doi.org/10.14686/buefad.908259

INTRODUCTION

Mathematic requires many activities such as abstraction, classification, and generalization. Classification means understanding the group of various objects according to the similarity and generalization which mean that an object based on knowledge is developed through specific examples. Moreover, math is learnt to use and replace symbols (Sappaile & Djam, 2017). From this aspect, teaching mathematics can also be defined as providing mathematical knowledge and skills that a person will need in the daily life. Teaching problem-solving and providing a way of thinking evaluate events according to the approach of problem-solving (Ministry of National Education [MoNE], 2009). There are many definitions related to the concept of problem in literature. According to Blum and Niss (1991), the problem is that the situations in which a person does not have any methodological, procedural, or algorithmic knowledge to answer. It consists of open questions and mentally challenging individuals. According to Morgan (1995), the problem is a situation of conflict in which the individual faces obstacles in the process of achieving his/her goal. According to Olkun and Toluk Uçar (2003), the problem is a situation that creates curiosity to solve and it does not have a ready solution However, itcan be solved by using one's knowledge and experience. Many researchers categorize the types of problems as routine and non-routine problems in the teaching of mathematics (Altun, 2015; Anderson, 2009; Cai, 2000; Laterell, 2013; Lee & Kim, 2005; Reusser & Stebler, 1997). In this context, routine problems' solutions are known before. (Mayer & Hegarty, 1996), and they are frequently encountered in the daily life. They can be solved by knowing and applying four operational skills correctly (Altun, 2015). On the other hand, non-routine problems are problems that do not have a known- method or formula for solution, require the student to analyze the data carefully, make a creative attempt, and use one or more strategies (Artut & Tarım, 2006; Sita Pramayudi, Sudiarta, & Astawa, 2020).

According to many mathematics educators, the solution of both routine and non-routine problems has a unifying importance in connecting learners' mathematical experiences as a meaningful whole (Posamentier & Krulik, 2008). In this context, Schunk (2012) defines problem solving as an effort to reach a goal in a situation where the individual does not have an automatic solution. In addition, in order for individuals to solve problems, they need to develop, combine and change the information they previously learned to obtain a successful solution (Fülöp, 2015; Posamentier & Krulik, 2008). On the other hand, teaching problem solving in mathematics teaching can be applied in three different ways (Schroeder & Lester, 1989; Van de Walle, Karp & Bay-Williams, 2013). These are teaching for problem solving, teaching about problem solving, and teaching with problem solving. In this context, teaching for problem-solving will be presented. It offers a traditional approach, and the problem is solved after the students are taught. Teaching about problem-solving is teaching the student problem to solve the steps or strategies. Finally, in teaching with problem-solving the student learns the problem through real contexts, situations, and models. According to this approach, skills are formed in the problem-solving process, and learning happens through problem-solving.

It is seen that individuals also try to find out many different strategies in the process of problem-solving (Altun, 2015; Baykul, 2019; Fan & Zhu, 2007). A strategy is a group of mental or physical actions designed to solve a problem. Strategies can be taught or they can appear spontaneously as a result of the rearrangement of plans (Biddlecomb & Carr, 2010). According to Posamentier and Krulik (2008), strategies that start with simple applications and are used in increasingly difficult and complex problems also provide students with the opportunity to use their problem-solving skills in the daily life. In literature, problem-solving strategies generally include arithmetic strategy, finding a pattern strategy, guess and check strategy, drawing strategy and equation strategy (Fan & Zhu, 2007; Fong & Hsui, 1999; Posamentier & Krulik, 2008; Van de Walle et al., 2013; Yazgan & Arslan, 2019). From this point of view, arithmetic strategy can be generally said as a type of strategy in which the student writes a mathematical expression that includes one or more operations by using the numbers given in the problem (Fong & Hsui, 1999). Find a pattern strategy is to create a different sequence by applying the arithmetic or geometric rules involved in the problems. On the other hand, it can be said that the guess and check strategy, also called as "try and see," (Van de Walle et al., 2013) is a type of strategy that we use unconsciously in our daily lives (Posamentier & Krulik, 2008). Drawing strategy, on the other hand, is a type of strategy that can be used not only in the geometry problems but also in all kinds of problems (Polya, 1957), and enables the relationship between datas to be seen (Yazgan & Arslan, 2019). Finally, the strategy of establishing an equation is the equations created by using various symbols such as x, a instead of the unknown in the solution of mathematical problems.

When the relevant literature is examined in the context of problem types and solution strategies of these problems, some studies in the field focus on problem-solving strategies applied in routine problems (Atay, 2017; Avcu, 2012; Demir, 2019; Gür & Hangül, 2015; Yılmaz, 2019) and non-routine problems (Altun, Memnun &

Yazgan; 2007; Altun & Memnun, 2008; Andrade, Fortes and Mabilangan, 2020; Arslan & Yazgan, 2015; Elia, van den Heuvel-Panhuizen & Kolovou, 2009; Gürbüz & Güder, 2016; Gürsan & Yazgan, 2020; Mogari & Chirove, 2017; Saygılı, 2017). However, in the context of current literature, a limited number of studies (Bozkurt & Topal, 2019; Karakoca, 2011) that examines the strategies in the solution processes of both types of problems stand out. In this context, Arslan and Yazgan (2015) concluded in their study that sixth, seventh, and eighth grade students with their high achievement levels, in general, reach solutions to non-routine problems by using appropriate strategies. In addition, there is another important issue obtained from the research that students mostly try to find out the finding pattern and drawing strategies. Gür and Hangül (2015) also found in their study that although students were successful in the strategies of searching for patterns, working backwards, writing equations, and making lists, they were less successful in drawing and using predictive control strategies. Besides, Atay (2017) in his study revealed with the aim of determining the ability of secondary school for seventh grade students to use problem-solving strategies. It is stated that all students applied to the equation strategy; however, he found that students with average and low achievement in mathematics applied for the drawing strategy. On the other hand, Mogari and Chirove (2017) in their study while examining non-routine problem-solving strategies for the high school students, they concluded that students mostly used prediction, control, and modeling strategies. Moreover, another important finding in the study is that students of 11th grade got the highest average score in non-routine problems while students of 10th grade got the lowest score. Similarly, Saygılı (2017) examines the non-routine problem-solving skill levels of high school students as a result of their studies, and the strategies they use concluded that students most frequently use the strategies of making systematic lists, finding pattern, logical thinking, and drawing. Yılmaz (2019) also found that students mostly used prediction-checking, making a list and using equation strategies as a result of his study to determine the strategies used by undergraduate students in classroom education in the process of problem-solving. Last, Andrade et al. (2020) concluded that students mostly use arithmetic strategy, prediction control and drawing strategies in solving non-routine problems. As seen from the studies mentioned-above, when the relevant literature is examined in the context of problem types and the solution strategies of these problems, it is seen that some of the studies focus on problem-solving strategies applied in the routine problems. Others focus on the solution strategies of non-routine problems. In this context, routine problems develop students' four-operation skills and they reinforce their newly learned knowledge. On the other hand, non-routine problems provide the development of thinking skills such as adapting, organizing, classifying, and associating the knowledge gained through routine problems to different situations. It is important to determine the success levels of the students in these types of problem by considering both types together. They should know the strategies they apply and determine the existing situations of the students by considering two types of problem in terms of being understood by both teachers and mathematics educators. However, in the context of the current literature, it is seen that there are a limited number of studies examining the strategies in the solution processes of both types of problems. It is aimed to determine the situations of secondary school students in solving routine and non-routine problems and the strategies they use while solving these problems. For these purposes, the following questions are tried to be solved in the study:

1. What is the level of secondary school students' solving routine and non-routine problems?
2. What strategies do secondary school students use while solving routine problems?
3. What strategies do secondary school students use while solving non-routine problems?

METHOD

In the study which aims to determine the students' situations of solving routine and non-routine problems for the secondary school students and to reveal the strategies they use while solving these problems, the survey model was used. Survey model is the gathering of information about a large sample in relating to a specific subject or situation (Fraenkel, Wallen, Hyun, 2012). In this study the secondary school students' situations about solving the routine and non-routine problems and strategies they use in this process were determined.

Population and Sample

The population of the research consists of 6th, 7th and 8th grade secondary school students affiliated to Adıyaman Directorate of National Education. The sample of the study involves 430 students studying in the 6th, 7th, and 8th grades of two public secondary schools determined by homogeneous sampling. Purposeful sampling enables in the research by selecting well-developed information. Homogeneous sampling is to examine subgroups in a detailed way by taking a homogeneous sample (Patton, 2014). The study group determined by the homogeneous sampling method consists of the successful students of the best two secondary schools in the region from the upper secondary socio-economic level. It is seen that 52.6% (226) of the students that make up the sample

of the study are girls, and 47.4% (204) of them are boys. According to the grade level, 38.8% (167) of the students are 6th grade, 30.2% (130) for 7th grade, 30.9% (133) for 8th grade students. Besides, students' mathematics grade is classified according to the criteria within the scope of the national education examination passing regulation (MEB, 2019). According to this information, when the mathematics reports scores of the students were examined, 53.5% (220) of the students in question were good; 18.3% (69) were in good, 8% (30) were in medium, 6.4% (24)were passed and 8.8% were not passing the exam(33).

Data Collection Tools

In the research "Routine and Non-Routine Testing Problem" and "Problem Evaluation Rubric" were used as data collection tools in order to determine students' situations of solving routine and non-routine problems. In this context, the Routine and Non-Routine Problem Test were designed by the researchers to determine the situation of students solving routine and non-routine problems by making use of the current literature (Cai, 2000; Karakoca, 2011) (Appendix 1: Routine and Non-routine Problem Testing). While choosing these problems, students should have the quality to solve problems by producing more than one strategy. In addition, attention has been paid to ensure that it is suitable for both the students and the secondary school mathematics curriculum. Content validity of the prepared problems was presented to the views of two mathematics educators. However, two of the questions were about algebraic expression, and they were not suitable for the level of sixth grade students, since it is considered that the other two problems can be solved with a single strategy. These four questions were excluded from the test. The remaining four routine and four non-routine problems were applied to 64 students outside the study group. In this context, there was no problem in understanding the questions and it was decided that two hours in a lesson were sufficient. Furthermore, the reliable value of the test was calculated as α=.86. If this result is higher than .80, it can be accepted as an indicator that the test is reliable (Özdamar, 2013). On the other hand, the Problem Evaluation Rubric (Appendix 2: Problem Evaluation Rubric) used in the study was scored according to the five-point rubric created by Cai (2000). According to this rubric, each question scores are between 0 and 4. Accordingly, if the student's explanation and the solution process are correct and complete, the student will get 4 points. The student's explanation and solution process are basically correct, but if there are minor mistakes, the student will have 3 points. The solution process of the student is a bit understandable, but if the result is not reached, the student will score with 2 points. If the student has very limited knowledge, the student is scored with 1 point, and if the student solve the problem incorrectly or leave it blank, the student is scored with 0 points.

Data Collection

During the data collection process, the necessary permissions were obtained from the Adıyaman Provincial Directorate of National Education and the ethical approval board of the university, and the school administration was informed about the purpose of the study. In this context, the pilot study was carried out with 64 (6th grade: 19, seventh grade: 21 and eighth grade: 20). Students at the school work with at least one of the researchers. It took approximately nine weeks to collect data. The process of data collection was completed in two hours of class (totally 80 minutes).

Data Analysis

In the process of data analysis, SPSS 22 (IBM Corp, 2017) program was used. The data were also analyzed using descriptive statistics and descriptive analysis methods. In this context, eight questions in the Routine and Non-Routine Problem tests were firstly coded in a separate way by the researchers according to the problem evaluation rubric in order to determine the students' problem-solving status. Then the obtained codes were compared, and a consensus was achieved among the researchers. In the next stage an expert in problem-solving and mathematics education worked as the second coder, and they coded the answers of 30 randomly selected students. The agreement percentage of the data encoded by the researchers and the expert suggested by Miles and Huberman (1994) and it was calculated as .95. On the other hand, the strategies used by students in routine and non-routine problem tests were analyzed by descriptive analysis method. In the descriptive analysis, the data are interpreted by organizing them into the previously determined themes or titles (Yıldırım & Simsek, 2016). In this study, problem-solving strategies were prepared by using the current literature (Cai, 2000; Posamentier & Krulik, 2008; Yazgan & Arslan, 2019). The strategies used by the students were coded separately by the researchers, and then the codes obtained were compared and a consensus was achieved in cases where there was a difference of opinion. In the next stage, the same mathematics educator worked as the second coder and he/she coded the randomly selected data collection tool. The agreement percentage of the data coded by the researchers and the expert were calculated as .91 according to the formula suggested by Miles and Huberman (1994). On the other

hand, codes such as S1, S2, S3, S4, S5, S6, S7, S8, and S9 were used to keep the identities of the students participating in the study. In this context, for example, S1 code refers to the first student's answer sheet while S2 code refers to the second student's answer sheet.

Research Ethics

Ethical principles and rules were followed during the planning, data collection, analysis, and reporting of the research. Ethical compliance approval was obtained for this research in accordance with the decision of the Scientific Research and Publication Ethics Committee in the field of Social and Human Sciences of Çukurova University Ethics Committee dated on 02.06.2020 and numbered with 95704281.

FINDINGS

According to the first sub-purpose of the study, the arithmetic mean and standard deviation scores regarding the students' level of solving routine and non-routine problems are given in Table 1.

Table 1. The Arithmetic Mean and Standard Deviation Distributions of Students for Each of the Routine and Non-Routine Problems

Problem Type Problems	Problems	$\bar{X}$	ss
Routine Problems	Washing Machine	2.69	1.48
	Map	2.75	1.47
	Pizza	2.21	1.82
	Camping	2.31	1.97
	Total	2.49	1.23
Non-Routine Problems n	Restaurant	1.85	1.99
	Blok	1.80	1.99
	Bus	1.89	1.98
	Island	2.07	1.74
	Total	1.90	1.40

When Table 1 is examined, it is seen that the problem with the highest average in routine problems is the washing machine problem ($\bar{X}$=2.69), and the problem with the lowest average is the pizza problem ($\bar{X}$=2.21). In non-routine problems, it is seen that the highest mean is the island problem ($\bar{X}$=2.07), and the problem with the lowest average is the block problem ($\bar{X}$=1.69). When analyzed in terms of total score, it is seen that the average of routine problems ($\bar{X}$=2.31) is higher than the average of non-routine problems ($\bar{X}$=1.90).

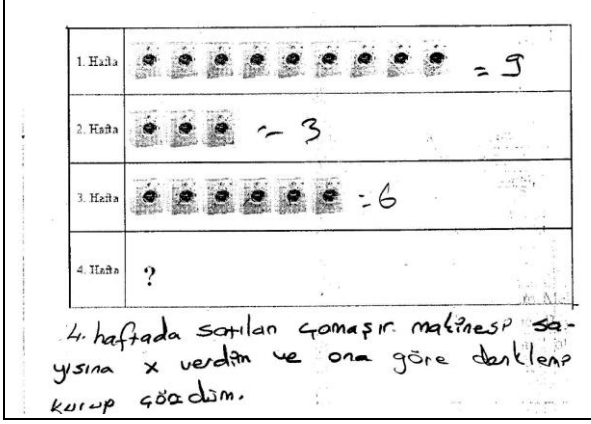
According to the second sub-purpose of the study, the frequency and percentage values of the strategies used in solving routine problems of the students are included in Table 2.

Table 2. Percentage and Frequency Values of the Strategies Used by Students to Solve Routine Problems

Routine problems	Arithmetic strategy		Guess and check strategy		Equation making strategy		Logical Reasoning strategy		Drawing strategy		Total	
	f	%	f	%	f	%	f	%	f	%	f	%
Washing Machine	142	54	63	24	59	22					264	100
Map	157	66			81	34					238	100
Pizza	170	65					46	18	44	17	260	100
Camping	225	100									225	100
Total	694	70	63	6	140	14	46	5	44	5	987	100

When Table 2 is examined, it is seen that students mostly use arithmetic strategy (70%) and least use logical reasoning (5%) and drawing (5%) strategies in solving routine problems. Accordingly, the solution examples of the students are listed below in order. As the first of the routine problems it is seen that in the washing machine

problem the students mostly used the arithmetic strategy (54%), then the guess and check strategy (24%) and the least equation strategy (22%). The solution of the student with the code of S197 in this matter is seen in Figure 1.



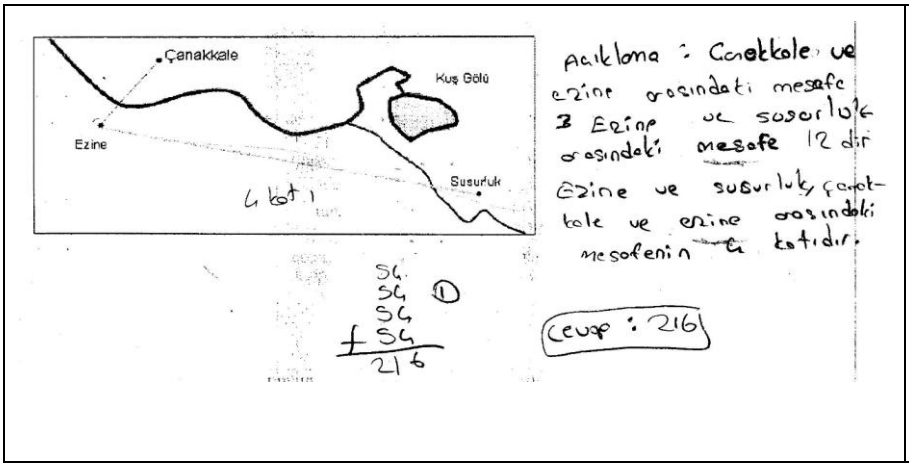
Student solution:

"I gave x to the number of washing machines sold in the 4th week and I created the equation and solved it accordingly."

Figure 1. *The Solution Made by A 7th Grade Student with Code S197 in the Washing Machine Problem*

Figure 1 shows the solution form of the 7th grade student (S197) who solves the washing machine problem in accordance with the strategy of establishing an equation. Accordingly, the student showed the situation with x (unknown) because he did not know 9 machines sold in the first week, 3 machines sold in the second week, 6 machines sold in the third week, and the number of machines sold in the 4th week. Then, he summed up the number of machines sold each week (18+x) and divided the expression by 4 to 7, and solved the equation to reach the correct answer.

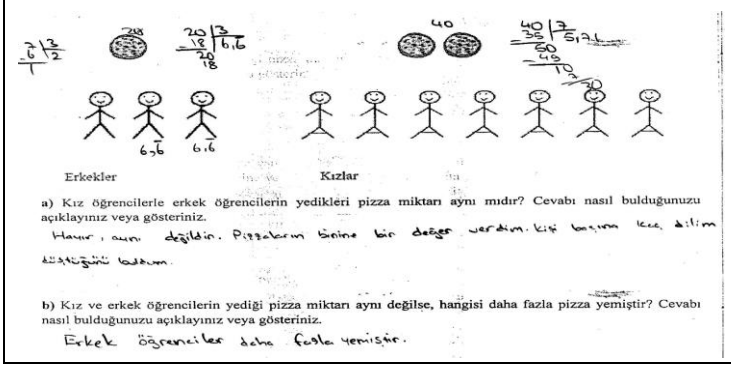
In the map problem, one of the routine problems is seen that the students mostly (66%) used the arithmetic strategy and 34% of them used the equation strategy. In this context, for example, the procedure for the solution of the map question of the 6th grade student with the code of S51 is shown in Figure 2.



Student solution: "Explanation: The distance between Canakkale and Ezine is 3 units, and the distance between Ezine and Susurluk is 12 units. Ezine and Susurluk are 4 times in accordance to the distance between Canakkale and Ezine."

Figure 2. *The Solution Made by A 6th Grade Student with Code S51 in the Map Problem*

When Figure 2 is examined, it is seen that the 6th grade student uses the arithmetic strategy in the map problem. According to it, the student coded S51 shows that the distance between Çanakkale and Ezine is 3 units, and the distance between Ezine and Susurluk is 12 units. In the next stage, the student found that the length between Ezine and Susurluk was 4 times longer than the distance between Çanakkale and Ezine (12 ÷ 3 = 4). Moreover, in order to find out how many kilometers is he has reached the desired result by summing 54 of them in 4 times (54 + 54 + 54 + 54 = 216). On the other hand, it was concluded that students mostly (65%) used arithmetic strategy in pizza problem that is one of the routine problems. Furthermore, 18% of these students used the logical reasoning strategy while 17% used the drawing strategy. In this context, the procedure for solving the map question of the 6th grade student with code S152 is shown in Figure 3.

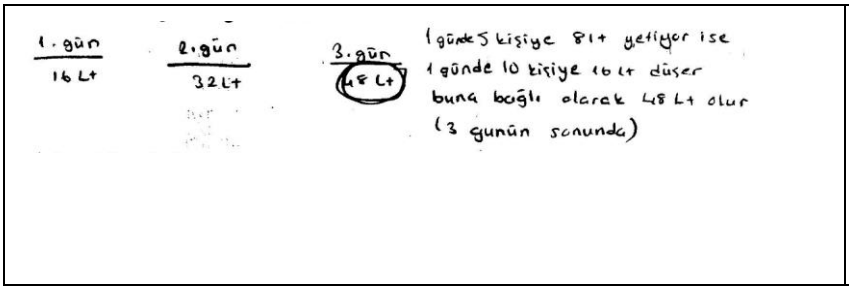


Student solution: "a) No, it is not the same. I gave a value to one of the pizzas. I found out how many slices per person. b) Male students ate more."

Figure 3. *The Solution Made by A 6th Grade Student with Code S152 in the Pizza Problem*

When Figure 3 is examined, it is seen that the 6th grade student with the code of S152 used the arithmetic strategy in solving the pizza problem. Accordingly, S152 coded student pizzas were divided into 20 slices. While 6.6 (20/3 = 6.6) slices of pizza were dropped for each male student, 5.7 slices of pizza were dropped for each female student (40/7 = 5.7). In the next option, he concluded that men ate more pizza as more slices were dropped by the male students.

Among the last of the routine problems, the camping problem is seen that all the students reach their conclusion by solving the arithmetic strategy. In this context, the procedure for solving the map question of the student with the code of S182 is shown in Figure 4.



Student solution: "If 8 liters is enough for 5 people in a day, 16 liters will be for 10 people in a day. Accordingly, it becomes 48 liters at the end of three days"

Figure 4. *The Solution Made by A 7th Grade Student with Code S182 in the Camp Problem*

When Figure 4 is examined, it is seen that the 7th grade student with the code S182 used the arithmetic strategy in the camp problem. Accordingly, the student coding S182 calculated that 16 liters of water would be enough for 10 people using the correct proportion. In the next step, the student coding S182 calculated three times the value he found by using the proportion to find the three-day amount of water (16x3 = 48).

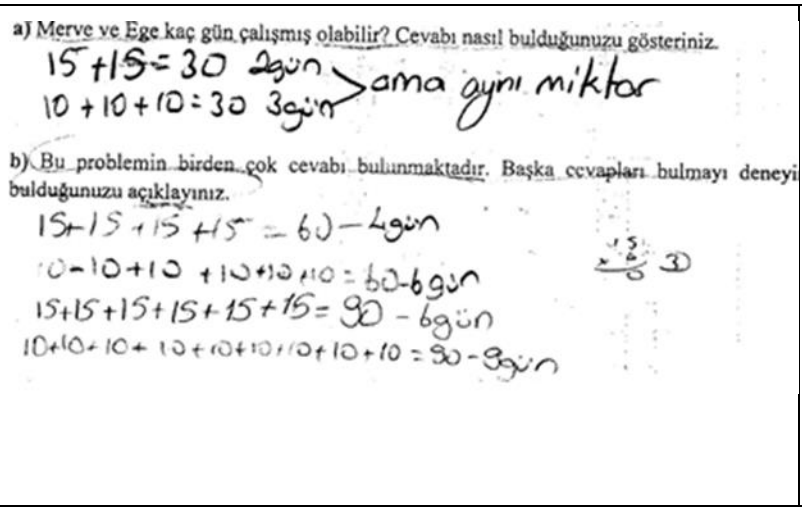
According to the third sub-purpose of the research, the frequency and percentage values of the strategies used in solving routine problems of the students are given in Table 3.

Table 3. Percentage and Frequency Values of the Strategies Used by Students to Solve Non-Routine Problems

Non-Routine Problems	Arithmetic strategy		Guess and check strategy		Systematic listing strategy		Total	
	f	%	f	%	f	%	f	%
Restaurant	140	87	-	-	21	13	161	100
Blok	64	44	81	56	-	-	145	100
Bus	192	100	-	-	-	-	192	100
Island	125	70	53	30	-	-	178	100
Total	521	76	134	20	21	4	676	100

When Table 3 is examined, it is seen that the students mostly used the arithmetic strategy (76%) in the solution of non-routine problems, and the systematic list strategy (4%) was used at least. Accordingly, examples of solutions made by students are listed below.

In the restaurant problem which is in the first place in non-routine problems, it is seen that students mostly use the arithmetic strategy (87%) and at least the systematic list strategy (13%). In this context, the procedure for the solution of the restaurant problem by a 7th grade student with the code of S167 is shown in Figure 5.



Student solution:

"a) 15+15=30 (2 days)

10+10+10=30(3 days, but the same amount)

b) 15+15+15+15=60 (4 days)

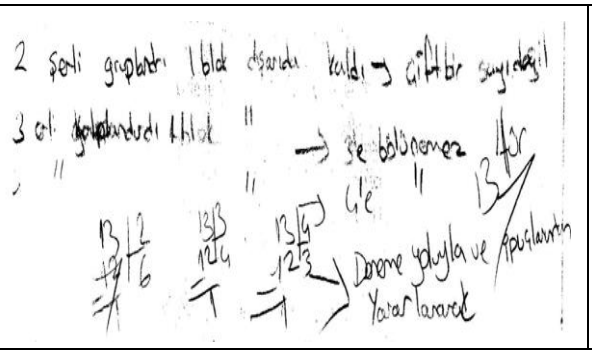
10+10+10+10+10+10=60 (6 days)

15+15+15+15+15+15=90 (6 days)

10+10+10+10+10+10+10+10 +10=90 (9 days)"

Figure 5. *The Solution Made by A 7th Grade Student with Code S167 in the Restaurant Problem*

When Figure 5 is examined, it is seen that the 7th grade student used S167 the arithmetic strategy in the solution phase of the restaurant problem. Accordingly, the student reached the conclusion by adding numbers to the solution of the problem. Besides, the student found that Merve, who is in one of the options in the problem, earned 30 TL when she worked for two days, and earned 30 TL when Ege worked for three days. It is seen the problem reached the result by equalizing the money they earned. On the other hand, in the non-routine block problem it is seen that 56% of the students apply the guess and check strategy, and 44% in the arithmetic strategy. In this context, the procedure for the solution of the block problem by the 6th grade student with the code of S86 is shown in Figure 6.



Student solution: "Grouped by 2, 1 block left out – not an even number

Grouped by 3, 1 block left out – not divided by 3

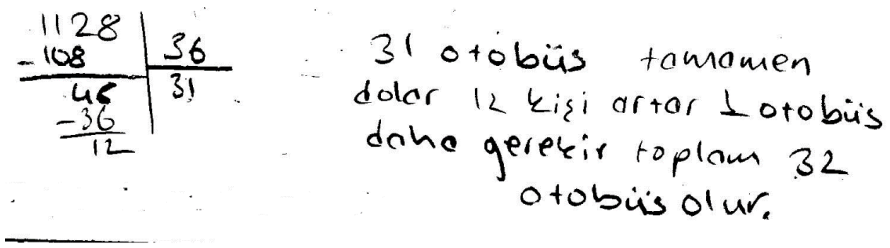
Grouped by 4, 1 block left out – not divided by 4

I found it by trial and using hints"

Figure 6. *The Solution Made by A 6th Grade Student with the Code S86 in the Block Problem*

When Figure 6 is examined, it is seen that the 6th grade student with S86 used the guess and check strategy in the block problem. Accordingly, the student stated that in solving the problem the blocks were grouped into two, three and four, but they increased one block at a time. Moreover, the same student stated that when the blocks are grouped by two, the total number of blocks cannot be double because it increases by 1 block. When it is grouped by three, it cannot be divided into three, and in the groupings of four the total number of blocks cannot be a multiple of two, three and four since one block will increase by not being divided into four. Then, he reached the conclusion by using the clues he found and the number 13 gave the desired answer.

In the non-routine bus problem, it is seen that all the students solved the problem with the arithmetic strategy. In this context, the procedure for solving the bus problem of the 7th grade student with the code of S200 is shown in Figure 7.

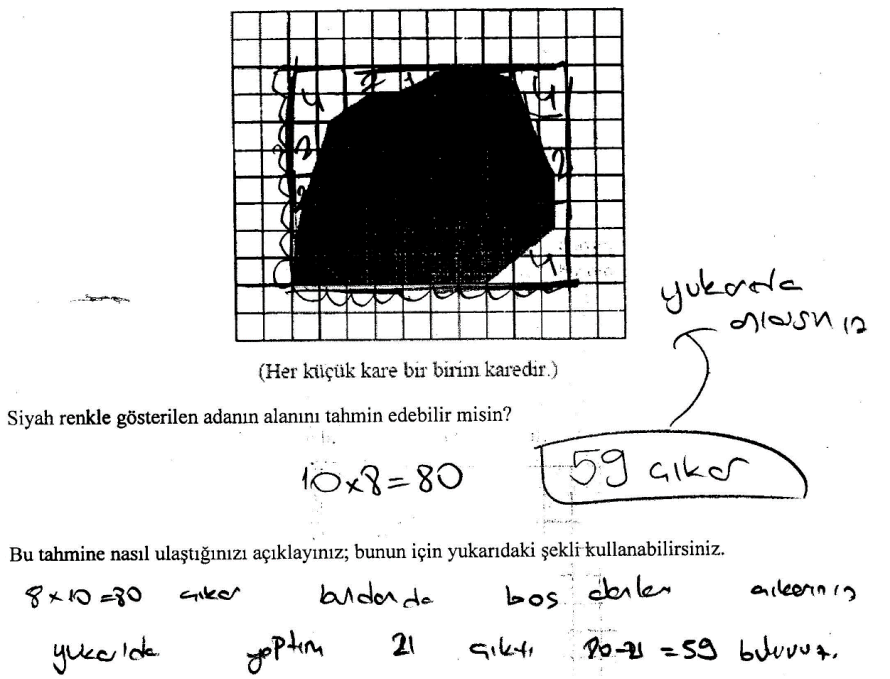


Student solution: "31 buses are fully filled. 12 people left. 1 more bus is needed. There will be 32 buses in total."

Figure 7. *The Solution Made by A 7th Grade Student with Code S200 in the Bus Problem*

When Figure 7 is examined, it is seen that the 7th grade student uses the arithmetic strategy in the bus problem. Accordingly, in the solution of the problem the student divided 1128 into 36 in order to get places to 1128 students on buses of 36 people and found the result of the division as 31. For 12 students who remain, he added 1 more bus and reached 32 answers.

Finally, in the non-routine island problem 70% of the students used the arithmetic strategy. It is seen that 30% of them apply the estimation and control strategy. In this context, the procedure for the solution of the island problem by the 8th grade student with the code of S354 is shown in Figure 8.



Student solution: "8.10=80. I solved the problem above. The result 80-21=59 is found."

Figure 8. *The Solution of the 8th Grade Student with Code S354 in the Island Problem*

When Figure 8 is examined, it is clearly seen that the solution of the 8th grade student coded S354 according to the arithmetic strategy in the island problem. Accordingly, the student in question drew a rectangle around the black island and calculated the area of this rectangle (10×8=80). In the next step he calculated the unit squares for the white area inside the rectangle he drew. At last, by subtracting the sum of the white unit squares from the area of the rectangle, he concluded (80-21).

DISCUSSION & CONCLUSION

This study was conducted to determine the situations of secondary school students to solve routine and non-routine problems, and the strategies they use while solving these problems. Accordingly, when students' solving routine and non-routine problems were examined, it was concluded that the students participating in the study were more successful in solving routine problems than non-routine problems. This result obtained from the study is also like the studies in literature (Cai, 2000; Bozkurt & Topal, 2019; Karakoca, 2011; Taskın et al., 2012). In this context, Karakoca (2011) found that sixth grade students' success in routine questions was higher than their success in non-routine questions in a study that examined the solution process of routine and non-routine problems. Similarly, Bozkurt and Topal (2019) concluded that sixth grade students were successful in routine problems but could not perform well in non-routine problems. Finally, Taskın et al. (2012) also found that students scored higher

in routine problems than non-routine problems in the achievement test of routine and non-routine problems they applied to high school students. On the other hand, when the findings of the research regarding the strategies used in problem-solving are examined, it is clearly seen that the students participating in the study mostly use arithmetic and guess and check strategies in both routine and non-routine problems. This result obtained from the research points to similar results with the studies conducted in literature (Andrade et al., 2020; Avcu, 2012; Karakoca, 2011; Yılmaz, 2019). In this context, Karakoca (2011) stated in his study that he conducted sixth grade students used the guess and check strategy more than the others. Moreover, Andrade, et al. (2020) found in their studies that arithmetic strategy and prediction control strategies are the most-used strategies by students in solving non-routine problems. Finally, Yılmaz (2019) also revealed that teacher candidates in the class mostly used the strategies of guess and check, systematic listing and equation.

Other important finding obtained from the research is that equation setting and logical reasoning strategies are only applied in the solution process of routine problems. In this context, when the current literature is examined, it is seen that this result is partially similar to the studies conducted in the field (Atay, 2017, Demir, 2019; Gür & Hangül, 2015; Yılmaz, 2019). In this context, for example, Yılmaz (2019), as a result of his study to determine the strategies used by prospective classroom teachers in the routine problem-solving process, revealed that classroom teacher candidates mostly used prediction-checking, make a list and equation using strategies. Again, Gür and Hangül (2015) found in their study that students were successful in equation and make a list strategies, but they were less successful in drawing and using guess and check strategies. Similarly, Atay (2017) also preferred the strategy of making equations most of the secondary school students. They reached the conclusion.

Conclusion and Recommendations

It is thought that this study, which was conducted with the aim of determining the situation of solving routine and non-routine problems of secondary school students and the strategies they use while solving these problems contributes to researchers in terms of mathematics education. In this context, in the study, it is clear that students mostly resort to arithmetic strategies, guess and check strategies, and systematic listing strategies in the context of non-routine problems. In this context, Saygılı (2017), as a result of his study examining the non-routine problem-solving skill levels of high school students and the strategies they use, concluded that students mostly use the strategies of making systematic lists, finding patterns-correlations, and logical thinking. Similarly, Mogari and Chirove (2017) found that high school students mostly used the prediction control strategy in their study, where they examined non-routine problem solving strategies.

At the end of the study which was conducted with the aim of determining the situation of secondary school students in solving routine and non-routine problems and the strategies they use while solving these problems, it was revealed that students were generally more successful in solving routine problems than non-routine problems. For this reason, it is recommended to include non-routine problems more in the classroom and in textbooks in the lessons of mathematics. Moreover, it was concluded that in the process of solving routine and non-routine problems, arithmetic strategy and prediction control strategies were mostly used by the students who participated in the study. However, it was revealed that students used drawing, making a list and logical reasoning strategies, but they never used the strategies of finding pattern, elimination, and working backwards. In the context of this result, it is thought that eliminating the deficiencies of students in learning different strategies and increasing students' awareness will significantly contribute to problem-solving processes. On the other hand, the reasons why students use some strategies little or not at all should be investigated. Subjects in the class of mathematics and teachers' inclusion of all kinds of problem-solving strategies in the classroom can help students to gain a different perspective, improve their problem-solving skills, and look at events from a broader perspective. The fact that this study was conducted only with secondary school students can be expressed as a limitation. In this context, longitudinal studies can be conducted with students at different education levels to examine the developmental levels of the students in the process. Moreover, other limitation of the study is the collection of data only by quantitative research method. In future studies it may be suggested to conclude interviews with teachers by using qualitative research methods or to examine how the problem-solving process is carried out and which strategies are applied by making classroom observations. In addition, it can be suggested to conduct studies on encouraging students to use the least used strategies such as drawing, systematic listing, finding correlations, elimination and drawing in the non-routine problem-solving process by interviewing the teachers.

Statements of Publication Ethics

As authors of the research, we declare that the study has no unethical problem and we observed research and publication ethics. Ethical principles and rules were followed during the planning, data collection, analysis, and reporting of the research. Ethics Committee Approval was obtained from the Scientific Research and

Publication Ethics Committee in the field of Social and Human Sciences of Çukurova University (the letter dated on 02.06.2020 and numbered with E. 95704281).

Researchers' Contribution Rate

This work is a product of the first author's master's thesis. The data were collected by the first author and conducted under the supervision of the second author.

Conflict of Interest

There is no conflict of interest for this study.

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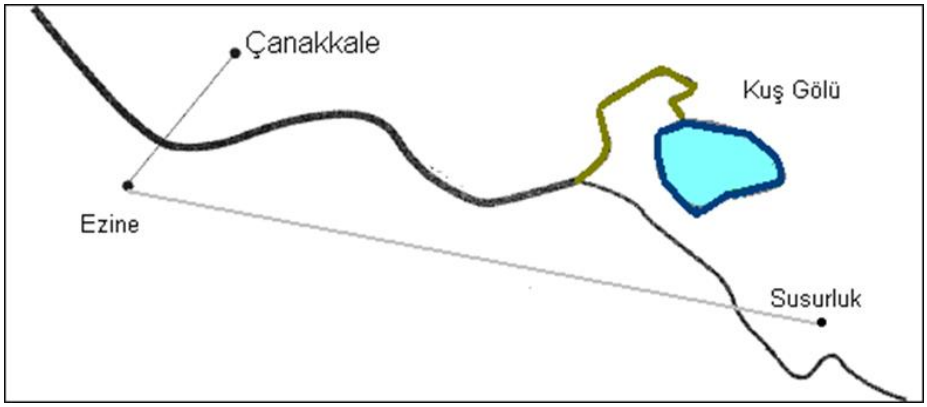
APPENDIX

Appendix 1. Routine and Non-routine Problem Test

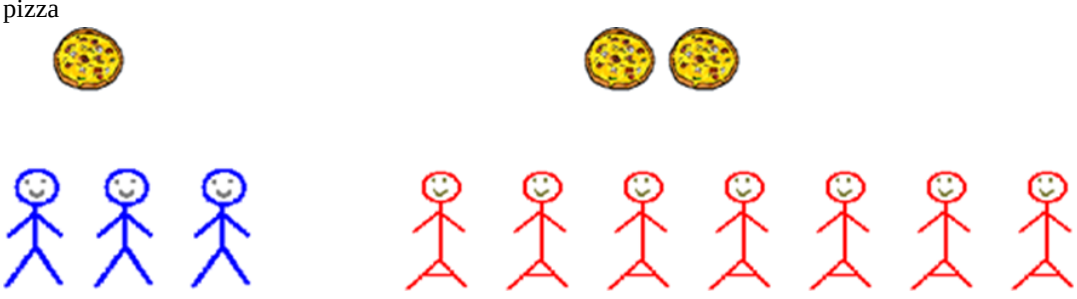
Routine problems

1) Washing Machine Problem: Mr. Mehmet owns a white goods store. The picture-below shows the number of washing machines Mr. Mehmet sold in the first three weeks of January. How many washing machines should Mr. Mehmet sell on the 4th week so that the average of the number of washing machines sold in a month is 7? Show how you found the answer.

2) Map Problem: The actual distance between Çanakkale and Ezine is 54 km. On the map, the distance between Çanakkale and Ezine is 3 cm. Accordingly, if the distance between Ezine and Susurluk is 12 cm on the map, what is the actual distance between Ezine and Susurluk? Show how you found the answer.



3) Pizza Problem: There are 7 female and 3 male students below. 7 girls will share 2 pizzas, 3 boys will share 1 pizza equally.



a) Is the amount of pizza eaten by female students and male students the same? Explain or show how you found the answer.

b) If the amount of pizza eaten by male and female students is not the same, which one ate more pizza? Explain or show how you found the answer.

4) Camping Problem: A group of 10 people will go to a 3-day scout camp. However, since there is no water in the place where they will go, they must take water to drink. Because of it, they saw in the scout guide book they read that 8 liters of water is enough for 5 people for a day. In this case, how much water should the group of 10 people who will go to the summer camp take with them? Show how you found the answer.

Non-routine Problems

1) Restaurant problem: Merve and Ege are two friends working together in the same restaurant. While Merve's job is to sell hamburgers, Ege's job is to clean the tables where the customers sit. While Merve earns 15 TL in a day, Ege earns 10 TL. While the total number of days Merve and Ege worked are not equal, the total amount they earn is equal to each other. According to this information,

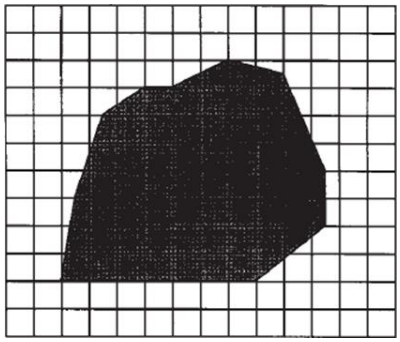
a) How many days could Merve and Ege have worked? Show how you found the answer.

b) This problem has multiple answers. Try to find other answers and explain how you found the answer.

2) Block problem: Ayşenur's father, Mr. Mustafa, asks his daughter what she is doing in today's math class. Ayşenur answers as follows: 'Today we used blocks in math class. When I grouped the blocks in my hand as 2 sets , 1 block was left out. When I grouped them in 3, 1 block was left out. When I grouped 4 of them, 1 block was left out.' Ayşenur's father, Mr. Mustafa, said to his daughter: 'How many blocks did you have?' What do you think was Ayşenur's response to her father? Explain how you found the answer.

3) Bus problem: With the spring, 13 Kasım Primary School decides to take a trip to Istanbul by renting a bus. There are 1128 people in total who will participate into the voyage. If there are 36 seats on each bus, how many buses are needed in total?

4) Island problem: The region shown in black represents an island below.



a) Can you guess the area of the island in black?

b) Explain how you arrived at this estimate. You can use the figure metioned-above for it.

Appendix 2: Problem Evaluation Rubric

The criteria of the problem-solving rubric created by Cai (2000) is given as follows:

4 points: The student's explanation and solution process are correct and their explanations are complete.

3 points: The student's explanation and solution process are basically correct, but there are some minor errors and uncertainties.

2 points: The student did not fully understand the problem and could not reach a conclusion.

1 point: It is understood that the student has limited knowledge in the explanation and solution process.

0 points: The student did not understand the problem at all or left it unanswered.

In the scoring process, each problem was evaluated according to the scoring criteria graded over 4 points. Furthermore,

in the scoring of 2-stage problems, the first stage was evaluated as 2 points, and the second stage was evaluated as 2 points.

Bartın University Journal of Faculty of Education BUEFAD

2023, Volume 12, Issue 1, 16-29
dergipark.org.tr/buefad
DOI: 10.14686/buefad.960307

Student Misbehaviours Encountered in Private High School Classrooms

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Research Article
Received: 30.06.2021
Revised: 15.03.2022
Accepted: 17.03.2022

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ABSTRACT

The aim of the present study was to identify student misbehaviours in private high schools, and the reasons for and teachers' reactions to such behaviours. The study was designed as qualitative research. In this qualitative case study, the participants were 21 teachers working in two different branches of a private school and 188 students registered in those schools. The data were collected utilizing two semi-structured interview schedules consisting of three questions each which were directed to students and teachers. The data were analysed using content analysis technique. Student misbehaviours included; noise, student-sourced misbehaviours, misbehaviours aimed at peers and misbehaviours aimed at teachers. The reasons for student misbehaviours were determined and classified as; student-sourced, family-sourced, peer-sourced, teacher-sourced, and education system and school-centred reasons. Teachers' reactions towards misbehaviours included; warning, shouting, scolding, having one-on-one or whole class conversations with students, explaining the consequences if the same behaviour is repeated, referring students to school administrators or the counselling service, and informing families. Ensuring that teachers understand the reasons for and how to react to student misbehaviours can make significant contributions to their main duty in classrooms which is "realizing learning objectives". As such, the present study informs teachers about the reasons for student misbehaviour as well as their solutions.

Keywords: High school, misbehaviour, discipline, teacher, student

Özel Liselerde Karşılaşılan İstenmeyen Öğrenci Davranışları

ÖZ

Bu araştırmanın amacı, özel liselerde öğrencilerin istenmeyen davranışlarını ve bu davranışlara öğretmenlerin tepkilerini ve istenmeyen davranışların nedenlerini belirlemektir. Araştırma nitel araştırma olarak tasarlanmıştır. Bu nitel durum çalışmasının katılımcıları bir özel okulun iki farklı şubesinde görev yapan 21 öğretmen ve bu okullarda kayıtlı 188 öğrencidir. Veriler, öğrencilere ve öğretmenlere yönelik her biri üç sorudan oluşan iki yapılandırılmış görüşme formu kullanılarak toplanmıştır. Veriler içerik analizi tekniği kullanılarak analiz edilmiştir. Öğrencilerin istenmeyen davranışları; gürültü, öğrenci kaynaklı istenmeyen davranışlar, akranlara yönelik istenmeyen davranışlar ve öğretmenlere yönelik istenmeyen davranışlardır. İstenmeyen öğrenci davranışlarının nedenleri öğrenci kaynaklı, aile kaynaklı, akran kaynaklı, öğretmen kaynaklı ve eğitim sistemi ve okul kaynaklı nedenler olarak belirlenmiştir. Öğretmenlerin istenmeyen davranışlara yönelik tepkileri ise uyarmak, bağırmak, azarlamak, öğrencilerle bire bir veya tüm sınıf ile konuşmak, aynı davranışın tekrarlanması durumunda sonuçlarını anlatmak, öğrencileri okul yöneticilerine veya rehberlik servisine yönlendirmek, aileleri bilgilendirmektir. Öğretmenlerin, öğrencilerin istenmeyen davranışlarının nedenlerini ve bunlara nasıl tepki vereceklerini anlamalarının sağlanması, sınıflardaki temel görevleri olan öğrenme hedeflerini gerçekleştirmeye önemli katkılar sağlayabilir.

Anahtar kelimeler: Lise, istenmeyen davranışlar, öğretmen, öğrenci

To cite this article in APA Style:
Aydın, B. (2023). Student misbehaviours encountered in private high school classrooms. *Bartın University Journal of Faculty of Education, 12*(1), 16-29. https://doi.org/10.14686/buefad.960307

INTRODUCTION

Teachers -in order to facilitate student learning- should possess various knowledge and skills such as educational psychology, teaching methods, assessment and evaluation, curriculum development, materials use, and classroom management. Of those, classroom management includes further sub-topics such as time management, communication, rules, discipline, teaching management, and physical organization.

Establishing discipline in the classroom has been defined as; teacher reactions aimed at preventing student behaviours which disrupt learning (Karip, 2003; Ünal & Ada, 2000), the rules and regulations set up in order to organize the lives of a group of people brought together for a shared purpose as well as measures taken to ensure that those rules and regulations are abided by (Sarıtaş, 2000), establishing rules in the classroom in order to facilitate learning and minimize misbehaviours (Erdem, 2012), and teachers' responding to student misbehaviours in the best way possible (Borich, 1996). Student misbehaviours are one of the important concepts included within classroom discipline. In relation to this, teachers should be aware of what those are, which ones occur in the classroom, the reasons for their occurrence, and how to react when such behaviours emerge.

Student misbehaviours can take place within or outside the classroom. The definition of misbehaviours taking place outside the classroom can be different than the definition of the ones taking place within the classroom. Additionally, teachers encounter misbehaviours more frequently within the classroom. According to Dreikurs, misbehaviours are student behaviours which chronically prevent regular teaching activities (Charles, 1996). Similarly, according to İlgar (2007), any behaviour that prevents reaching learning objectives is misbehaviour.

Various misbehaviours occur in the classroom. Aydın (2001) conducted a study with the participation of eighth grade students, teachers, and school principals. The results showed that students considered the following as misbehaviour; talking among peers, disturbing the person nearby, playing with cell phones, being occupied with issues not relating to the lesson, acting disrespectfully and irresponsibly, sending paper messages, throwing rubber, playing with pencil, walking around the classroom, talking without being given the right to, and making weird noises. Teachers, on the other hand, considered the following as misbehaviour; not paying attention to the lesson, noise, throwing pen and/or paper at each other, doing activities not related to the course, not studying, talking without being given the right to, interrupting peers, not listening to the lesson, and using swear words.

In another study conducted with high school teachers, Özgözlü (2007) found that the most frequently encountered misbehaviours within the classroom were; talking among peers, not listening to the lesson (i.e. dreaming, sleeping, paying attention to things unrelated to the lesson), talking without being given the right to, being late to the class, and not doing the tasks being assigned. The least frequently encountered misbehaviours were found to be; complaining about peers, throwing objects, and using peers' belongings without allowance.

Understanding the reasons for the occurrence of misbehaviours is a perquisite for taking appropriate measures to find a solution (Aydın, 1998). Various factors such as the teacher, student, family, school, environment, physical conditions of the classroom, and curriculum can cause the emergence of misbehaviours in the classroom. Yıldırım and Aydın (2019) classified misbehaviours into two; within school (i.e. teaching and school management, teacher, student) and outside school factors (i.e. family, environment and society, formal education). Teachers are one of the important reasons for the emergence of misbehaviours in the classroom. Teachers' previous experiences, the training they have in terms of classroom management, the difficulty level of the lesson, not establishing rules, not getting students engaged enough, coming unprepared to the lesson, attitudes towards rewards and punishment, and incompetency in communication skills are among teacher-sourced reasons of student misbehaviours in the classroom (Yiğit, 2009). Similarly, not providing an appropriate response to student misbehaviours, not rewarding desirable behaviours of students, not having expectations that are parallel to students' abilities, not being tolerant enough of individual differences among students, not being role models for desirable behaviours, and utilizing punishment to deal with misbehaviours are among teacher-sourced reasons for student misbehaviours (Ada, 2003). Pagliaro (2011) stated that the majority of misbehaviours are teacher-sourced. In relation to this, Elma (2014) noted the following teacher actions to cause misbehaviours; having an attitude that looks down on students, bearing grudge, bestowing privileges on certain students, dramatizing small problems, interrupting students or not listening to them, being boring whilst teaching a lesson, utilising strategies which do not engage students or do not diversify materials, ignoring the strengths of students and focusing on their weaknesses, doing activities and assigning tasks without considering students' characteristics, and behaving inconsistently. According to Ataman (2005);

1. If the teacher does not react to students' behaviours appropriately or if the teacher does not explain the right and wrong behaviours clearly then students cannot learn how to behave in the classroom.

2. If the teacher does not reward desirable behaviours and only focuses on misbehaviours then the number of misbehaviours is likely to increase. The teacher should also reward desirable behaviours.

3. If the teacher's expectations are not parallel to students' abilities then the students would experience problems in responding to teacher's expectations and -therefore- would be more inclined to misbehave. For example, if the homework is at a level which the student cannot complete then the student will be more inclined to not do the homework.

4. If the teacher is does not pay enough attention to students' individual characteristics and expects all students to show the same reactions then this can lead to misbehaviours.

5. If the teacher does not provide a role model for students to follow then students might copy and repeat the misbehaviour they observed their teachers do.

6. If the teacher often deals with misbehaviours by giving punishments and shouting at students even when they do small mistakes then this can result in misbehaviours among students.

Students' previous learning experiences, abilities and interests, values, attitudes, beliefs, and characters can also cause misbehaviours. Being too much dependant on the teacher, having difficulties in concentration, being unorganized, having negative attitudes towards teachers and peers, lack of self-care abilities, being introvert, being aggressive towards peers and teachers, being unmotivated, having low levels of academic achievement (Akçadağ, 2015), and mood swings caused by adolescence can cause students to exert misbehaviours. Students' desire to look independent might result in a number of misbehaviours such as rebellion, not listening to the authority, resistance, and angry responses to critics (Akar, 2003). Similarly, students' attempts to conceal their failures, attract teachers' and peers' attention, retaliate, external provocations, being bored of easy tasks, being bored of difficult tasks, uncertainties resulting from not understanding the directives given to complete a task, being emotionally disturbed, and having a lack of attention can result in misbehaviours (Montague, 1987). Prete (1981) and Myers et al. (1987) underlined the existence of a relationship between student behaviours and academic success. This relationship is bidirectional: students whose grades are low are more likely to exert undesirable actions and students who behave in an undesirable manner are more likely to become unsuccessful (Hartzell & Thomas, 1996).

Publications such as television, computers, cinema, newspapers, magazines, and novels can cause the development of bad habits and students might try to imitate movie characters (Akçadağ, 2015). Media which encourage violence and brute force can have an effect on student behaviours. Students who take movie characters as role models are likely to try to behave like them (Özdemir, 2004). And this pushes students to misbehave. Students who watch too much TV have been found to be too active, experience sleeping disorders, be unwilling to do homework, daydream, imitate TV characters, and be introvert (Küçükkurt, 1989 as cited in Taş, 2015). It is possible to argue that cell phones, in today's world, also encourage student misbehaviour in the classroom (Nair, 2019).

A school which only praises academic success causes a tense, uneasy, and stressful atmosphere for everyone. Overcrowded environments, big classrooms, and administrators' groundless pressure can also cause misbehaviours. Physical conditions such as gloomy buildings and floors, lack of game and sports activities, lack of ventilation and heating, having a small teachers' room, lack of teaching materials, and not exhibiting students' academic, sportive and non-academics achievements are among the reasons for discipline problems (Humphreys, 1999).

Misbehaviours in the classroom can also be caused by the family factor. The negative developments affecting family lives following urbanization can cause many problems such as students not being able to express their ideas, becoming anxious quickly, not being able to perform their potential, lack of entrepreneurship, and socialization problems (Topses, 2000). Children whose parents are divorced can experience affective disharmony, various behavioural disorders, and failure in school. Furthermore, as a result of their mothers' not being able to care for them, students can become shy and abstain from participation in classroom activities (Tezcan, 1996). Families' indifference to their children's education, having negative attitudes towards their children (Aksoy, 2000), children not being able to meet their emotional needs, wrong and inconsistent reward-punishment practices, giving students responsibilities above their capabilities (Arıcak, 2005), being perfectionist, having high expectations from their children, overprotection, denial, neglect, and perceptions of teachers (Özdemir, 2004) can also cause misbehaviours in the classroom.

The way teachers respond to student misbehaviours affect what kind of individuals those students will become in the future. When responding to student misbehaviours, teachers should pay attention to students' physical and psychological health and teachers should prioritize not harming the learning atmosphere in the classroom. There is not a magical or unique method to deal with student misbehaviour. One method that works with a student might not work on the other. Moreover, it might be necessary to use different strategies for the same student at different points in time. Therefore, it is important to know about the various strategies that can be used (Çelikkol, 2015). Charles (1996) studied 20 different models developed to explain how various misbehaviours should be responded to. Furthermore, teachers' main duty in the classroom is to realize learning objectives. Student misbehaviours that teachers encounter in the classroom can prevent teachers from realizing those objectives. Studies that are conducted to understand the reasons for the emergence of student misbehaviours and generate solutions to such misbehaviours can allow teachers to focus their attention on their main duties, teaching.

In Turkey, education is carried out in state schools and private schools. Public schools and private schools are different in many aspects (i.e. resources). Consequently, the problems experienced and the solutions found to the problem can differ. Nevertheless, one of the shared problems in both public and private schools is the misbehaviours encountered in the classroom. Bingölbalı (2018) states that students in private schools behave disrespectfully and rudely towards their teachers, do not want to do homework, do not obey the rules, and even put pressure on them. According to Gürler (2020), teachers in private schools are more tolerant and cannot apply pressure to students because they receive their salaries from the institution they work for. Therefore, it is considered it is a necessity to conduct research on the problems and solutions faced by teachers working in private schools regarding misbehaviours. It is thought that the study will benefit the teachers and school principals working in private schools in terms of what misbehaviours are their causes and solution methods.

The aim of this research is to determine the opinions of teachers and students about the misbehaviours encountered in private secondary school classrooms, their causes and solution methods. The answers to the following questions were sought for the purpose of the study. According to the opinions of teachers and students;

1. What student misbehaviours are encountered in the classroom?
2. What are the reasons for the misbehaviours encountered in the classroom?
3. What reactions do teachers show to misbehaviours?

METHOD

Research Model

The present study was designed as a case study which is one of the qualitative research designs. In case studies, one or more cases (i.e. an incident, a person or groups of people) are studied in depth (Cohen, Manion, & Morrison, 2005; Yıldırım & Şimşek, 2011). Since it aimed to undertake an in depth investigation of student misbehaviours in two private high schools via teachers' and students' perspectives, the present study fits the criteria of a case study.

Participants

The participants in this study were selected among 35 teachers and 252 students who worked/studied in two branches of a private high school and 21 teachers and 188 students of that population participated in the study. The reason why the study included only one private school was the researcher's ease of access to and convenience of that particular school. Maximum variation sampling strategy was utilized in recruiting participants. Both male and female teachers who taught different subjects at different levels and male and female students who studied in different classes were included in the study sample.

17 of the teachers participating in the study were female and four were males. Five teachers taught mathematics, five taught literature, two taught chemistry, two taught history, two taught English, two taught geography, one taught biology, one taught physical education, and one taught physics. 91 students were male and 102 were females. 67 of those were in the 9th grade, 67 were in the 10th grade, 38 were in the 11th grade, and 21 were in the 12th grade.

Data Collection Tools and The Process of Collecting Data Collection

Data were collected utilizing two semi-structured interview schedules (one for teachers and one for students) consisting of three questions each. The questions in the interview form were created by scanning the

relevant literature. While preparing the questions, attention was paid to the aim of the research, to be easy to understand and to include a single subject. The data was collected via the Internet utilizing Google Forms. The following questions were asked to the students in the interview form;

1. What misbehaviours do you encounter most in your classroom?
2. Why do students, who behave undesirably, behave this way in your opinion?
3. How do your teachers react when misbehaviours occur in your classroom?

The following questions were asked to the teachers in the interview form;

1. What are the misbehaviours you encounter in the classrooms?
2. What are the causes of misbehaviours in your opinion?
3. What kind of reactions do you give to the misbehaviours you encounter in the classroom?

Data Analysis

Content analysis was used to analyse the data. Qualitative research data in content analysis can be analysed in four stages: coding data, finding themes, organizing codes and themes, and defining and interpreting findings. In the coding phase of data, coding was carried using a framework. In this type of coding, the general themes are determined beforehand and the codes under these themes are revealed after the analysis of data (Yıldırım & Şimşek, 2008). Moreover, the frequencies of the codes for teachers' and students' perceptions under each sub-theme were calculated and tables were created to represent the statistics.

External validity in qualitative research relates to the transferability of the findings to other situations, and internal validity relates to the plausibility of the findings and whether the findings are meaningful (Miles & Huberman, 1994). In order to increase the internal validity (plausibility) of the findings, the researcher paid special attention to the integrity and consistency of the findings. In order to increase external validity (transferability), the data were collected utilizing an interview schedule and stages of the analysis were detailed. Moreover, in order for other researchers who wish to study a similar topic to be able to compare the findings, the results (themes, sub-themes) were detailed and clearly described.

Reliability in qualitative studies is related to the consistency of research processes. In order to increase the external reliability of the data (confirmability), the researcher's stance, the theoretical framework utilized in the study, and processes involved were explained to the participants. In order to increase the internal reliability (conformability), the data were analysed utilising a pre-determined theoretical framework. The results of the study were presented clearly and as a whole (Miles & Huberman, 1994).

Additionally, the data were coded separately by two independent coders and inter-coder agreement between the coders was calculated. It has been stated that agreement levels above 70 % provide a satisfactory level of reliability (Miles & Huberman, 1994). The level of agreement between coders was calculated as 72 % which was considered to be a satisfactory level of reliability.

Research Ethics

The current study follows all ethical issues in the research procedure. Additionally, XX University Ethical Committee approves the study.

FINDINGS

Below student and teacher perceptions of student misbehaviours in the classrooms of private high schools are presented.

Findings in Relation to Misbehaviours in The Classroom

Student misbehaviours encountered in the classroom are presented in Table 1 from the perspective of teachers and students.

Table 1. Teachers' Perceptions of Misbehaviours in the Classroom

Theme	Sub-themes	Codes
Student misbehaviours	Misbehaviours that prevent student learning (f=25)	Paying attention to things other than the course during the lesson (f=5; i.e. watching videos unrelated to the course using tablet PCs, attempting to play games using tablet PCs, checking mobile phones)
		Coming to the lesson unprepared (f=4; i.e. not having the course materials)
		Not doing homework (f=2)
		Being late to the class (f=2)
		Not paying enough attention to the course (f=2)
		Other (f=10; i.e. trying to pressure the teacher so that they can leave earlier, being reluctant to participate in classroom activities, not listening to the lesson, wanting to talk about things other than the course, not being able to identify goals about the future, putting their heads on the desk, not participating in classroom activities, being bored, being angry whilst establishing communication, and sleeping)
	Misbehaviours aimed at peers (f=6)	Communication problems with peers (f=5; i.e. being disrespectful towards peers whilst talking to them), not paying attention to peers
	Misbehaviours aimed at teachers (f=3)	Talking to teachers in a disrespectful manner (f=2), interrupting teachers whilst they speak
	Noise (f=3)	

Teachers underlined the following as misbehaviours they encountered in the classroom; misbehaviours that prevent student learning (i.e. paying attention to things other than the course, coming to the lesson unprepared, not doing homework, being late to the class, not paying enough attention to the course), misbehaviours aimed at peers (i.e. communication problems with peers), and misbehaviours aimed at teachers (talking to the teachers in a disrespectful manner, interrupting the teacher), and noise.

Table 2. Students' Perceptions of Misbehaviours in the Classroom

Theme	**Sub-themes**	**Codes**
Student misbehaviours	Noise (f=89)	
	Misbehaviours that prevent student learning (f=20)	Laughing (f=3),
		Asking unrelated questions during the lesson (f=3),
		Not being able to concentrate in the class (f=2),
		Other (f=12; i.e. eating, walking in the classroom, reluctance to participate, not paying attention to the course, using cell phone and playing songs/videos, being late to the class, asking the teacher for permission to leave the class, efforts to create a humorous environment, making comments to everything, providing the answer of a question whilst it is being answered by another student, talking without being given the right to, loud laughter, singing)
	Misbehaviours aimed at peers (f=16)	Mockery (f=8),
		Quarrelling with peers during the course (f=3),
		Considering oneself to be superior to peers (f=3),
		Other (f=2; provoking peers, insulting peers).

	Shouting (f=10)
	"There are no misbehaviours" (f=38)

Students noted the following as misbehaviours in the classroom; misbehaviours that prevent student learning (i.e. laughing, asking unrelated questions during the lesson, not being able to concentrate in the class), misbehaviours aimed at peers (i.e. mockery, quarrelling with peers during the course, considering oneself to be superior to peers), and shouting. It is worth noting that students, unlike teachers, made more frequent references to noise and shouting.

Findings on the Reasons of Misbehaviours

Findings on the reasons of misbehaviours from the perspective of students and teachers are provided below

Table 3. Students' Perceptions of Misbehaviours in the Classroom

Theme	Sub-themes	Codes
Reasons of misbehaviours	Student-sourced reasons (f=39)	Being non-compliant (f=11),
		Characteristics of adolescence [f=7; not being able to complete the process of adolescence (f=2), the desire to stand out as because of adolescence (f=2), not being able to complete the personal development that adolescence brings in, emotional confusion caused by adolescence, students' focus on developing social skills rather than academic because of their age)
		Screen addiction starting from early ages (f=2),
		Students getting bored of the lesson (f=2),
		Students not being aware of their responsibilities (f=2),
		Other (f=15; lack of concentration, disliking studying, having everything prepared for themselves, sense of wonder, lack of dreams and ideals, not having goals, disliking the school, not being able to blend in to the school culture, lack of desire to learn, disliking studying and listening to courses, disliking the class and peers, lack of self-confidence, imitating behaviours of those in their immediate environment, tiredness, being uninterested in difficult subjects, not wanting to make an effort)
	Family-sourced reasons (f=2)	Having family-related problems,
		Lack of education received from the family

Teachers noted the following to be the reasons for encountering misbehaviours; student-sourced problems (i.e. being non-compliant, characteristics of adolescence, screen addiction, getting bored of the lesson, not being aware of responsibilities) and family-sourced problems (i.e. having family-related problems, and the education received from the family).

Table 4. Students' perceptions with regards to the reasons of misbehaviours

Theme	Sub-theme	Codes
	Student-sourced (f=88)	Wanting to attract attention (f=12)
		Not wanting to listen to the lesson (f=9),
		Wanting to disrupt the lesson (f=8),
		The perception that they have fun when they create problems (f=8),
		Not caring about the lesson (f=5),

		Disliking the lesson (f=4), As a reaction to annoying incidents (f=3), Adolescence (f=3) As a result of not having any goals or concerns for the future (f=3), Not being able to concentrate on the lesson (f=3), The desire to prove oneself (f=3), Irresponsibility (f=3), Not understanding the lesson (f=2), The course not being able to arouse any interest (f=2), Stubbornness (f=2), Lack of stimulation (f=2), Not knowing how to act in certain situations (f=2), Other (f=14; having too much energy, trying to explain everything they know, lack of punishment, not being able to control oneself, desire to be successful, jealousy, holding grudge, having a bad day, not being adult enough, disrespect, stress, being lazy, being smarty, and abusing teachers' actions)
Reasons of misbehaviours	Getting bored (f=33)	
	Family-sourced (f=11)	The manner of upbringing in the family (f=8), As a result of family related problems (f=3),
	Teacher-sourced (f=3)	Teachers' inactivity, Teachers' covering too many topics in a given course, Since teachers treat students well
	Education system and school management (f=3)	Long lesson times, Having too many lessons on a single day, Lack of punishment by the school management
	Friends circle (f=2),	Friends circle, Experiencing problems with friends,
	"I have no idea" (f=26)	
	"There are no misbehaviours" (f=13)	

Students underlined the following as reasons of misbehaviours; student-sourced (i.e. wanting to attract attention, not wanting to listen to the lesson, desire to disrupt the lesson, the perception that they have fun when they create problems, not caring about the lesson, disliking the lesson, reaction to annoying incidents, adolescence), family-sourced (the manner of upbringing in the family, family-related problems), friend-sourced, teacher-sourced (teachers' inactivity in the classroom, teachers covering too many topics in the classroom, as a result of teachers' being too nice), and education system and school management related problems (long lesson times, having too many lessons on a given day, lack of sanctions).

It is worth noting that students, more frequently than teachers, mentioned getting bored in the classroom. Furthermore, whilst teachers generally considered students and family as sources of misbehaviours, students highlighted teachers, friend circles, and education system and school management as sources of misbehaviour.

Findings on Reactions Towards Misbehaviours

Findings in relation to student and teacher perceptions of what reactions teachers show when they encounter misbehaviours are summarized below (see Table 5).

Table 5. Teachers' Perceptions of the Reactions that Teachers Give When They Encounter Misbehaviours

Theme	Sub-themes	Codes
Teacher reactions to misbehaviours	Having a one-on-one conversation with the student (f=7)	Explaining why a certain behaviour should not be performed (f=2) Trying to convince students that there will be a more productive learning environment, Trying to raise students' awareness by telling anecdotes
	Motivating students to the lesson (f=5)	Starting the class by attracting students' attention, Including 3D videos, experiments, and various animations in the lesson, Focusing on practical rather than theoretical information, Gamifying the lesson, Following various strategies in order to engage students
	Warning (f=5)	Giving a verbal warning to students who misbehave
	Referring students to the counselling service (f=4)	Referring students to the counselling service if the same behaviour is repeated
	Following a step by step approach (f=3)	Warning the student who misbehave in the class as the first step, If the student continues acting the same way then having a one-on-one conversation with him/her, If the misbehaviour continues then referring the student to the counselling service or contacting the school administration in an effort to find a solution, Referring the student to the disciplinary committee as a last resort
	Aiming to increase student success (f=3)	Asking students easy questions and waiting for a response, Making revisions of previous units prior to starting a new one, Making an effort to increase student success and, more importantly, eliminate bias
	Other (f=7)	Applying rules, turning off the internet, relocating the student to a new seat, contacting the school administration, making the student wash his/her face, making the student ask question to the teacher, good lesson preparation

Teachers indicated that they gave the following reactions when they encountered misbehaviours; motivating students, having one-on-one conversations with students, warning them, referring them to the counselling service, following a step by step approach, and aiming to increase student success.

Table 6. Students' Perceptions of the Reactions that Teachers Give When They Encounter Misbehaviours

Theme	Sub-themes	Codes
Teacher reactions to misbehaviours	Warning (f=37)	Telling students to be quiet and asking them not to repeat the same behaviour,
	Shouting (f=31)	
	Getting angry (f=23)	
	Attracting students' attention (f=16)	Waiting the student to be quiet (f=8), Teachers increasing their voice (f=4) Looking at the student in an angry manner (f=3), Using the ruler to hit on the table
	Having a one-on-one conversation with the student in the class (f=7)	Teachers talk to us (f=3), Teachers take us out of the class and talk to us, Teachers explain the problem regarding the misbehaviour, Teachers explain that they should teach course content, Teachers talk to the whole class and the whole class try to find a solution to the problem
	Explaining the consequences if the same behaviour is repeated (f=7)	Telling the student that s/he will be referred to the discipline committee (f=3) Telling the student that s/he will be referred to the school principal or the vice-principal (f=2), Telling the student that s/he will be sent out of the class, Telling the student that s/he will get a minus, Telling the student that s/he will be unsuccessful in the exam if s/he does not listen to the lesson
	Showing no reaction (f=6)	
	Referring students to school administrators (f=5)	Referring the student to the vice-principal (f=4), Noting down student names and giving the name list to the school administration
	Stopping to teach (f=5)	
	Changing students' seat in the class (f=4)	
	Showing a step by step reaction (f=3)	Getting angry, warning the student, and getting angry after a while (f=2), Teachers talk to the student nicely, maybe, get a little bit angry and then ask the student to leave if s/he continues the same behaviour
	Informing the family (f=2)	Teachers note down our names and inform our families (f=2),
	Other (f=12)	Teachers show a reaction to students whom they do not like, punish the student, leave the class, increase students' participation in teaching/learning activities in an effort to prevent talking, do not treat students badly since they have good intentions, discuss issues with students, give advice, send students out of the classroom, remorse, get angry and hit an object, confiscate cell phones, warn the student once and then do nothing.
	"I do not know" (f=13)	
	"There are no misbehaviours" (f=9)	

Students noted that their teachers showed the following reactions when they encountered misbehaviours; warning, shouting, getting angry, attracting students' attention, having a one-on-one or a whole class conversation with students, explaining the consequences if the same behaviour is repeated, showing no reaction, referring

students to school administrators, not teaching the lesson, showing a step by step response, and informing the family.

Unlike students, teachers did not mention reactions such as shouting, getting angry, attracting students' attention, and referring students to school administrators, or informing family members. It is clear that teachers' and students' perceptions of teacher reactions to student misbehaviour are different from one another.

DISCUSSION & CONCLUSION

The present study investigated student misbehaviours experienced by teachers in private schools. The study aimed to identify the misbehaviour, the reasons for their emergence as well as the reactions teachers gave. A qualitative research methodology was adopted for gaining insights into teachers and students' perceptions of misbehaviour. Misbehaviours that are student-sourced (i.e. paying attention to other things than the lesson during the class, coming to the lessons unprepared, not doing homework, being late to the lesson, not paying enough attention to the lesson, laughing, asking unrelated questions), aimed at peers (communication problems with peers, making fun of peers, quarrelling during the lesson), and aimed at teachers (talking to the teacher in a disrespectful manner, interrupting the teacher) were reported to be experienced in private high schools. Talking in the classroom have been found to be the most frequently encountered misbehaviours in the studies conducted by Kesici and Sarpkaya (2019) and Siyez (2009). The findings (i.e. speaking during the lesson without being given the permission to, paying attention to other things than the course during the lesson, being late to the lesson, and being disrespectful to the teacher) of the meta-synthesis study carried out by Yıldırım and Aydın (2019) which analysed 11 studies are parallel with the results of the present study. On the other hand, Dirlikli et al. (2015) identified misbehaviours such as indifference to the lesson, coming unprepared to the lesson, noise, paying attention to other things than the course during the lesson. Moreover, results (i.e. indifference to the lesson, not being able to concentrate on the course content, paying attention to other things than the course, not doing homework, coming unprepared to the lesson, and walking in the classroom) found by Gökyer and Doğan (2016) are parallel with the findings reached in the present study. The reasons for making noise, paying attention to things other than the course, not being able to concentrate enough to the course content could be that teachers teach following only one strategy, do not diversify their teaching materials or strategies, thus, become unsuccessful in engaging students in the classroom as well as teachers' incompetency in classroom management and dealing with student misbehaviours.

The reasons for student misbehaviours have been reported to be; student-sourced (i.e. wanting to attract attention, not wanting to listen to the lesson, to disrupt the lesson, the perception that they have fun when they create problems, not caring about the lesson, disliking the lesson, as a reaction to incidents that annoy the students, adolescence, being non-compliant, screen addiction, and not being aware of responsibilities), getting bored, family-centred (i.e. the manner in which families raise their children, family-related problems), and education system and school management related problems (long lesson times, having too many lessons on a single day, lack of sanctions by the school management). Findings such as students' lack of goals, characteristics of adolescence (Yıldırım & Aydın, 2019), disliking the lesson, jealousy, lack of concentration, not having goals (Gökyer & Doğan, 2016), adolescence, family, media, and friend circles (Bilir, Kuru, & Tezcan, 2007) are in line with the findings of the present study. In this study, while the teachers expressed students and their families as the source of misbehaviours, the students reported the factors as following; fellow students, boredom, family, the education system and friend circles. According to the teachers, the source of misbehaviours is the fact that students break the rules. Starting as early as primary school, it is necessary to try to teach students the ability to obey the rules. Primary and secondary school teachers should also make the necessary effort to establish the rules in the classroom. In this sense, there is a need for all teachers, even school administrators, to act jointly. The students indicated that trying to draw attention and interest were the causes of misbehaviours. It is important for primary school students to receive the appreciation of the teacher. Beginning from middle school, the liking of friends begins to gain importance for children. Students may engage in misbehaviours in order to attain the appreciation of their classmates. For example, starting from middle school, students may oppose the teacher in the classroom. There may be different reasons for their opposition. One of these reasons may be to gain the admiration and appreciation of his friends as "Wow, how did he go against the teacher?".

Another reason for misbehaviours mentioned by the participants was "getting bored". It is possible that teachers' continuous presentation of course content tires students' minds which result in distraction and, consequently, the emergence of misbehaviours. Media tools such as TV and smart phones cause students to

become accustomed to dynamic and continuously changing stimulators. Therefore, students can get bored of activities in the school (Erden, 2008). Aydın's (2001) study indicated that students got bored of the lesson because of various factors such as; not being able to understand the course content, teachers' not being active whilst teaching the course content, students' not studying to the course content, course difficulty, long lesson times, not having understood course content covered in previous lessons, and teachers' being unsuccessful in teaching course content.

It was identified that when encountered with misbehaviours, teachers showed reactions such as; warning, shouting, getting angry, having one-on-one or whole class conversations, explaining the consequences if the same behaviour is repeated, showing no reaction, referring students to school administrators, not teaching the lesson, showing a step by step reaction, informing families, motivating students, referring students to the counselling service, and aiming to increase student success. While students more frequently stated that they encountered teachers' reactions such as getting angry, shouting, and warning students, teachers reported that they reacted to misbehaviours by motivating students to the course as well as having a one-on-one conversation with students exerting misbehaviours. The reason why teachers and students give different reactions to misbehaviours may be due to the teachers' desire to convey what they want to say by softening their reactions. A number of teacher reactions to misbehaviours are in line with the findings of related studies in the literature; warning, having one-on-one or whole class conversations, referring students to the counselling service or the principal, getting angry, changing students' seat, shouting, staring at students angrily, acting as if they do not care (Atıcı & Çekici, 2009), scolding, warning, asking students to leave the classroom, making changes to the course (Maya, 2004), having one-on-one conversation, warning, informing families, asking for support from the counselling service, getting angry, and shouting (Siyez, 2009). It does not seem possible to say that there is only one effective method for misbehaviours. The teacher can determine a reaction style by looking at the low, medium and high level of the behaviour, the conditions under which the misbehaviour occurs, the characteristics of the student, etc. While overcoming misbehaviours, teachers can use different ways such as their reactions during the behaviour, the techniques they use to prevent the misbehaviour from occurring, and getting support from the families, school administration or school the counselling service. Teachers should take into account the psychological health of students when reacting to the occurrence of misbehaviour. They should be able to control their own negative emotions. In a tense environment, it is the teacher, not the student, who should be patient first. It does not seem possible for teachers to overcome all misbehaviours in the classroom.

In conclusion, in private high school classrooms, noise is encountered the most. In addition to this, misbehaviours that prevent the student's own learning, misbehaviours towards students' friends and misbehaviours towards teachers are encountered. Misbehaviours can be caused by the students themselves, boredom in the lesson, families, teachers, the system or the school management. Teachers' reactions to misbehaviours are warning, shouting, getting angry, drawing attention to the lesson, speaking one-on-one or with the whole class, etc. Teachers should identify the causes of misbehaviour and react according to those reasons. Teachers should receive in-service-training on what misbehaviours are, their causes and how to solve them. Considering teachers' reactions to misbehaviours such as getting angry, shouting, expelling from the class, threatening with a grade, leaving the class, it can be argued that teachers should receive adequate training on how to deal with misbehaviours via in-service training as well as during pre-service education. In particular, teachers should be informed about the models developed to deal with misbehaviours.

Recommendations

Teachers will always encounter misbehaviours in the classroom. What is important is to identify the reasons for their emergence in an attempt for giving the kind of reactions that will allow students to change their behaviours. Teachers can focus on realizing student outcomes so long as they can deal misbehaviours. It is not possible to argue that there is a single method to deal with student misbehaviours. Teachers can decide on what reactions they would show by considering various parameters such as the seriousness of the misbehaviours, the conditions in which they occur, and student characteristics.

Statements of Publication Ethics

This research was approved by XX University Ethical Committee. Besides the author states that he/she followed all ethical issues in the study.

Researchers' Contribution Rate

The author of the article prepared all of the manuscript.

Conflict of Interest

There is no conflict of interest.

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BARÜ Bartın University Journal of Faculty of Education BUEFAD

2023, Volume 12, Issue 1, 30-46
dergipark.org.tr/buefad
DOI: 10.14686/buefad.927281

An Evaluation of an English Language Course Given via Distance Education

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Research Article
Received: 24.04.2021
Revised: 09.10.2022
Accepted: 30.10.2022

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ABSTRACT

Distance education has turned into the only option with the unexpected Covid-19 pandemic for many countries all over the world. In the system of Turkish higher education, it is frequently used for the compulsory basic English courses. This study aims to evaluate the effectiveness of the English course given at a state university in Istanbul in order to see the perceptions of the students in the distance education. It was a descriptive study conducted with 121 freshmen during the academic year of 2018 and 2019. The data were collected with a 5-point Likert type scale and analyzed via SPSS software. The findings revealed that the students were content with their experience of the distance English course. Moreover, they were pleased with the process at most and there was rather less satisfaction with the context, input, and the product of a course. However, the majority still consider face-to-face language instruction as a more satisfactory mode of learning. This study revealed a moderate satisfaction with the distance English course in general, and the main source of this satisfaction has been identified as the course instructors. Therefore, instructors need to be supported in their preparation for distance education courses with their rich materials and trainings. Moreover, the students found the course less efficient to develop writing and speaking, and needed a direct contact with the instructors at times. So, these courses should be designed to focus on productive skills more and to include some face-to-face or synchronous sessions along with the distance education classes regularly.

Keywords: Course evaluation, EFL, distance education, higher education, students' views

Uzaktan Eğitimle Verilen İngilizce Dersinin Değerlendirilmesi

ÖZ

Uzaktan eğitim Kovid-19 pandemisi ile dünyada pek çok durumda tek seçenek haline gelmiştir. Türkiye'deki yükseköğretim sisteminde ise zorunlu temel İngilizce dersleri için sıklıkla kullanılmaktaydı. Bu çalışma, İstanbul'da bir devlet üniversitesinde uzaktan eğitim ile verilen İngilizce dersinin etkinliğini öğrenci görüşlerine dayanarak değerlendirmeyi amaçlamaktadır. Çalışma, 2018-2019 akademik yılında birinci sınıfta okuyan 121 öğrenci ile yürütülmüş betimsel bir araştırmadır. Veriler, 5'li Likert tipi bir ölçek ile toplanmış, SPSS programı ile analiz edilmiştir. Bulgular, öğrencilerin uzaktan İngilizce dersi deneyimlerinden memnun olduklarını ortaya koymuştur. En yüksek memnuniyet, dersin süreç boyutuna ilişkindir. Öğrenciler dersin bağlam, girdi ve çıktı boyutlarına ilişkin daha düşük düzeyde bir memnuniyet bildirmişlerdir. Yine de çoğunluk yüz yüze eğitimi daha tatmin edici bulmuştur. Bu çalışmada uzaktan İngilizce dersine ilişkin orta düzeyde bir memnuniyet olduğu ve bunun temelde dersi veren öğretim elemanlarından kaynaklandığı anlaşılmıştır. Bu yüzden, uzaktan eğitim ile ders verecek öğretim elemanlarının eğitimlerle ve zengin materyallerle hazırlık aşamasında desteklenmesi önemlidir. Buna ek olarak, öğrenciler dersi yazma ve konuşma becerilerinin gelişimine katkısı açısından yetersiz bulmuşlar ve öğretmenleri ile zaman zaman doğrudan iletişim kurma ihtiyacı hissettiklerini belirtmişlerdir. Bu nedenle, uzaktan İngilizce derslerinin üretim odaklı becerilere daha fazla ağırlık verecek şekilde tasarlanması ve uzaktan eğitim ile yürütülen derslerin zaman zaman yüz yüze ya da eş zamanlı oturumlarla desteklenmesi önerilebilir.

Anahtar kelimeler: Ders değerlendirme, yabancı dil olarak İngilizce, uzaktan eğitim, yükseköğretim, öğrenci görüşleri

To cite this article in APA Style:
Denkci Akkaş, F. (2023). An evaluation of an English language course given via distance education. *Bartın University Journal of Faculty of Education, 12*(1), 30-46. https://doi.org/10.14686/buefad.927281

INTRODUCTION

Distance education has turned into the only option for millions of educators and learners with the unexpected Covid-19 pandemic all over the world, yet it is not a state-of-art concept. It is rooted into the ancient times "when early civilizations used drums, fire and smoke, petroglyphs and ultimately the printed word to communicate" (Threlkeld & Brzoska, 1994, p. 42). Distance education has always been shaped with the technological developments (Harry & Perraton, 1999); it was first carried out by writing letters, then with audio-visual aids like radio or TV, and finally, since the 1990s it has been framed by the Internet or Web-based technologies (Bozkurt, 2017; Demir, 2014; Kırali & Alcı, 2016; Özbay, 2015; Tulunay-Ateş, 2014).

Distance education means "a form of education in which learner and instructor are separate during the majority of instruction" (Johnson, 2003, p. 1). It is not a kind of self-study since it is conducted by institutions (Johnson, 2003; Simonson et al., 2011). Also, students and teachers are separated in place and/or time (Simonson et al., 2011; Tinio, 2003). This naturally brings in the advantages of availability and convenience both for teachers and learners (Yüce, 2022). Moreover, there is an effective interaction among learners and instructors thanks to such technologies as e-mails, teleconferencing, or videoconferencing (Simonson et al., 2011).

Distance education classes are carried out as either synchronous or asynchronous sessions (Işık et al., 2010; Kırık, 2014; Toker-Gökçe, 2008). Synchronous systems, as the name suggests, refer to the distance education classes in which participant teachers and students can have two-way communication in real-time; that is, all the students and the teacher are expected to be online at the same time (Balaban, 2012; Demir, 2014; Johnson, 2003). This allows students to interact with the teacher and each other, to have discussions, to ask and respond questions, and to do tests collaboratively (Baki et al., 2009; Toker-Gökçe, 2008). The paramount gain in this system is the immediate feedback learners can get when they face any difficulty or trouble and it promotes their academic achievement and learning motivation (Demir, 2014; Şenkal & Dinçer, 2012). However, this also requires all the participants to be equipped technically and technologically as well as to be competent in using the necessary technology. Additionally, participants always need continuous and broad bandwidth for their internet connection which may not be supplied by the current technical infrastructure (Işık, et al., 2010). This may cause problems for data transfer, and students may suffer from low-quality interaction (Şenkal & Dinçer, 2012; Yüce, 2019).

Asynchronous systems provide more flexibility since they allow learners to participate in classes from different places and at different times (Balaban, 2012; Johnson, 2003). That is why students are free to decide where and when to take classes and they can revisit the recorded sessions as many times as they wish (Demir, 2014; Toker-Gökçe, 2008; White, 2003). This type of distance education is considered as a more learner-centered method since students need to be more autonomous and take responsibility for their learning (Beyhan, 2007; Işık et al., 2010). Moreover, it is technologically less demanding compared to the synchronous sessions as minimum infrastructure and a normal bandwidth usually work for asynchronous systems (Işık et al., 2010; Şenkal & Dinçer, 2012). However, this may have negative effects on students' feelings of belonging and involvement due to the lack of immediate feedback from a teacher and other participants (Yorgancı, 2014; Yüce, 2022).

Distance education provides solutions to various educational problems in underdeveloped, developing, and developed countries. It reduces expenses of education in underdeveloped countries while it is a significant facilitator for mass education in developing countries. Such countries usually face difficulties in supplying compulsory education with traditional educational institutions, so they utilize distance education to compensate for this deficiency. On the other hand, developed countries benefit from distance education to meet lifelong learning needs in society and to improve the quality of education. Having well-functioning and established traditional educational institutions, these countries usually seek for flexibility and convenience (İşman, 2011, p. 5; Özkul & Aydın, 2020). Moreover, distance education is considered advantageous due to the following benefits: it saves time, reduces costs, gives access to more students, provides more education opportunities, supports the production, and spread of information. It also allows for convenient and fast communication, grants more learning and satisfaction, and finally results in creating values and making more profits (Balaban, 2012, p. 3; Yüce, 2022).

Turkey carried out distance education on its agenda after Dewey completed his "Report and Recommendation upon Turkish Education" in 1924. At the very beginning of the education system, the fundamental idea was to make use of distance education to increase the literacy rate in society. However, the plans were not put into practice until 1956. When the first real distance education system was set up with the correspondence education, TV channels were included in the distance education system for the first time thanks to TRT in 1968. In 1981, the first

open distance education faculty was founded by Anadolu University. As for the 1990s, many other universities and other schools from different educational levels (high schools and secondary schools) have opened various distance education programs which have made up a significant portion of the overall system (Bayram & Aksoy, 2002; Bozkurt, 2017; Cabi & Ersoy, 2017; Düzakın & Yalçınkaya, 2008; Kaçan & Gelen, 2020; Kırık, 2014; Özbay, 2015; Özer, 1989; Tulunay-Ateş, 2014; Yavuzalp et al., 2017).

In the Turkish higher education system, distance education is frequently used for the "common compulsory courses" which are usually known as 5i courses due to the article number of the related law (Yükseköğretim Kanunu, 1981). According to it, in all higher education programs the following three courses are compulsory: Ataturk's Principles and History of Turkish Revolution, Turkish Language, and Foreign Language. Regardless of their departments, all undergraduate students have to take these courses in Turkey so as to complete their BA. These courses are offered to a huge number of students and they bring about some challenges for the universities. For instance, they need enough academic staff to give these courses and enough space in buildings and weekly schedules which may become extremely challenging for some crowded schools with insufficient infrastructure. At this point, distance education is considered as a solution to these kinds of limitations (Adıyaman, 2002; Eroğlu & Kalaycı, 2020; Erol-Şahin, 2019; Fidan et al., 2018; Kocatürk-Kapucu & Uşun, 2020; Meriçelli et al., 2014; Pepeler et al., 2018; Yaman, 2015).

LITERATURE REVIEW

When the previous research upon applications of the distance education in the Turkish education system is considered, it is understood that teachers and learners point out some crucial concerns about it although they mention its advantages. For instance, Işıklı (2017) revealed that the higher education students who experienced the face-to-face version of 5i courses mandatorily were quite unsatisfied with the versions given via distance education stating that the face-to-face classes were much more sufficient. Likewise, in another study, Metin et al. (2017) concluded that the students found English courses in the distance education less effective than the face-to-face ones, and most of the participant students did not prefer taking the English course via distance education. In Tuncer and Bahadır's study (2017), the participant students stated that they could not learn the course content with distance education. Moreover, Yıldız (2015) revealed that the academic staff agreed with the learners on the inefficiency of distance education due to the lack of powerful interaction and direct communication from which they could benefit in physical classrooms. In short, there are various studies which show that distance education applications are evaluated negatively and considered less effective compared to the face-to-face sessions (Erfidan, 2019; Eroğlu & Kalaycı, 2020; Gürer et al., 2016; Keskin & Özer-Kaya, 2020; Pepeler et al., 2018; Şen-Ersoy, 2015).

Although some studies have revealed that students attending into the distance education courses are more successful than the ones taking face-to-face classes (Seven, 2012). A considerable majority have concluded that achievement decreases with distance education due to the lack of regular learner participation (Barış & Çankaya, 2016; Demirkan et. al, 2016; Gürer et al., 2016; Metin, et al., 2017; Özgöl et al., 2017). In Tuncer and Bahadır's (2017) study, the participant students stated that they tended to get lazier and more irresponsible with distance education courses. Therefore, especially students who lack self-discipline or autonomy may not follow the lessons regularly and cannot learn the content of course properly which will result in low levels of success or a direct failure. Adıyaman (2002) clearly states that regular and active participation are a key factor for the achievement in foreign language courses conducted with distance education.

There are some other significant drawbacks of distance education uncovered by the related research. One problem is the lack of preparation for distance education courses especially at higher education institutions. When teachers or instructors do not have a chance to get prepared for a distance education course, they tend to implement the content designed for the face-to-face sessions which are likely to result in loss of interest and motivation both for the teachers and learners (Gürer et al., 2016; Yaman, 2015). Likewise, students may not be accustomed to or ready for the distance education which may create dissatisfaction, negative attitudes, stress, or frustration (Gürer et al., 2016; Şen-Ersoy, 2015). Therefore, students expect to get oriented for such courses to feel safe within this new system (Erfidan, 2019; Şirin & Tekdal, 2015). Another issue is the inequality among the learners taking distance education courses. These are studies which show that there are a considerable number of students who do not have access to proper technology such as sufficient internet connection and quota or a personal computer to benefit from the distance education courses effectively (Erfidan, 2019; Gürer et al., 2016; Metin et al., 2017; Pepeler et al., 2018; Şen-Ersoy, 2015). Even if everyone had an equal opportunity to access the system, both teachers and students face irritating technical problems owing to insufficient infrastructures (Barış & Çankaya, 2016; Erfidan, 2019; Gürer et al., 2016; Özgöl et al., 2017; Şen-Ersoy, 2015; Yıldız, 2015). One final and

significant shortcoming is the inconsistency in testing and evaluation processes (Erfidan, 2019; Yaman, 2015). Generally, students complain about having face-to-face tests for such courses or doing super easy tests compared to the course content since they are not tested on vital language skills like speaking or writing (Eroğlu & Kalaycı, 2020; Metin et al., 2017; Özgöl et al., 2017). On the other hand, teachers and instructors consider cheating as a serious problem for online tests used in the evaluation of distance education courses (Kınalıoğlu & Güven, 2011; Uluğ & Tuncer, 2017).

Besides all the drawbacks mentioned-above, some notable advantages of distance education have also been revealed by the related literature. First, technology itself is a motivating element for learners and it provides flexibility and mobility for them. That is why they are free from time and place while taking their classes and they get the opportunity of learning by stopping or re-watching the videos if they wish in their own pace (Barış & Çankaya, 2016; Erfidan, 2019; Gürer et al., 2016; Özgöl et al., 2017; Şirin & Tekdal, 2015; Yüce, 2022). Furthermore, they feel more comfortable and less anxious out of physical classrooms; therefore, they get more self-confident, self-disciplined, and autonomous (Barış & Çankaya, 2016; Tuncer & Bahadır, 2017). If they attend the classes regularly, distance education increases their achievement and due to feeling successful, they develop positive attitudes towards such courses (Pepeler et. al, 2018; Seven, 2012).

Distance education is getting an inevitable place in our education system, and it has significant benefits as summarized-above. Therefore, it would be important to look for ways to improve it. It is necessary to evaluate the quality of distance education programs or courses to reveal their weaknesses and to plan how to compensate for the deficiencies and improve the effectiveness. To sum up, this paper serves a similar purpose for an EFL course given at a state university in Istanbul.

This study seeks to answer the following research questions: to the following research questions:

1. To what extent are the students satisfied with taking the English Course with distance education?
2. What are the strengths and the parts to be improved in the program of English Course conducted via distance education?
3. Do the students' perceptions vary in terms of their gender, their access to a personal computer or free internet access, the situation of their usage of a distance education course before, the average time that they spend on the internet per day, and their preference for distance education for the course?

METHOD

Research Design

This study has a descriptive research design in which the data are collected with a survey tool. Descriptive-survey research is a quantitative research type commonly used in educational studies and the purpose is generally to describe groups at one point in time or to detect differences between groups in terms of some demographic variables (Lodico et al., 2006, p. 174-175). Moreover, this research aims to describe the effectiveness of the English Course given via distance education based on the perceptions of the students taking the course. In other words, it is intended to reveal to what extent the students are satisfied with taking the English Course with distance education as well as to detect the strengths and the parts to be improved in the course program. It is also searched whether the students' perceptions vary in terms of the following factors: gender, having a personal computer and free internet access or not, having taken a distance education course before or not, their average time on the internet daily, and their preference of distance education for the course. In survey studies, information is gathered through self-reporting questionnaires or interviews like Likert type scales where participants are asked for degrees of their agreement with a statement (Hutchinson, 2004, p. 285; McDonough & McDonough, 2006, p. 176-177). Similarly, this study uses a 5-point Likert type scale to reveal what the participant students think about the distance education course.

Research Sample

This study was conducted with 121 freshmen who took the English Course via distance education at a state university in İstanbul during the 2018 and2019 academic year. Table 1 presents the background information in relation to the participant students.

Table 1. Sample of the Study

Variables		*n*	*f (%)*
Gender	Female	69	57
	Male	52	43
Faculty	Dentistry	3	2.5
	Arts and Humanities	45	37.2
	Education Sciences	6	5
	Law	14	11.6
	Engineering and Natural Sciences	11	9.1
	Health Sciences	10	8.3
	Art, Design, and Architecture	7	5.8
	Political Sciences	25	20.7
Having a personal computer	Yes	71	58.7
	No	44	36.4
	Missing	6	5
Having free internet access	Yes	86	71.1
	No	34	28.1
	Missing	1	0.8
Having taken a distance education course before	Yes	35	28.9
	No	86	71.1
Average time spent on the internet daily	0-2 hours	27	22.3
	3-5 hours	66	54.5
	6 hours +	26	21.5
	Missing	2	1.7
Total		121	100

As presented in Table 1, 69 of the participant students are female and 52 of them are males. Most of the participants are from the Faculty of Arts and Humanities (n=45) and Political Sciences (n=25) since these are the most crowded faculties of the university. Additionally, 58.7% of the students have a personal computer (n=71) and 71.1% have free internet access (n=86). However, only 28.9% of them have taken a distance education course before (n=36). It means the English course is the first distance education experience for the rest 71.1% (n=86). According to Table 1, 54.5% of the participant students (n=66) spend 3-5 hours on the Internet daily whereas there are also fewer students who spend less and more time.

Research Instruments and Procedures

The data were collected via the Scale of English Language Course Curriculum Conducted by Distance Education which was developed by Orhan and Çeviker-Ay (2017). This scale was found suitable for the aims of the study since it was specifically developed to evaluate 5i English programs based on the perceptions of university students taking it as a distance education course. These English courses are named after the article number in Law of Higher Education which states that all undergraduate programs are to offer Foreign Language, Turkish Language and Ataturk's Principles and History of Turkish Revolution as the three compulsory courses at Turkish universities (Yükseköğretim Kanunu, 1981). Therefore, almost all universities offer A1 and A2 level compulsory English courses in the freshman year by force of article mentioned-above in the law (Yaman, 2015). There are totally 36 items in the scale that make up the following four factors: context (6 items), input (8 items), process (9 items), and product (13 items). These factors refer to the components of the CIPP (context, input, process, product) model which asks four main questions for the program evaluation: "What should be done?," "How should it be practiced?," "Does the practice comply with what was planned?" and "Did the program become a success?" (Stufflebeam, 2003). To put it more explicitly, *context* includes items regarding the objectives and appropriateness of the course for the students' level, needs and expectations whereas *input* refers to the course content such as tests, materials, and resources. In addition, *process* is related to the actual implementation of the program and the teaching methodology while *product* covers the outcomes of the program. The scale involves five-point Likert-type items and the participants were asked to evaluate to what extent they agreed with each item as follows: 1= strongly disagree, 2= disagree, 3= neither agree nor disagree, 4= agree, and 5= strongly agree. The Cronbach's Alpha coefficient was calculated as .98 for the whole scale, and the reliability values for each of the factors are as follows: .92 for "content", .94 for "input", .93 for "process" and .97 for "product". The other personal information

about the participants' gender, faculty, personal computer, internet access, previous distance education experience, and the habit of internet usage were collected with a short questionnaire delivered along with the scale.

This study was conducted with the freshmen who took the English Course with the distance education at a state university in İstanbul during the academic year of 2018 and 2019. This course is compulsory for all the undergraduate programs with no exception, and it is given both for the fall and spring semesters to teach A1 level and A2 level English subsequently. At the beginning of the academic year, all the freshmen take an exemption test and the ones who fail automatically register to this course. The data were collected in the spring semester of the 2018-2019 academic year when 551 students in total registered for the course. It was a face-to-face course beforehand, but it was transformed into distance education, and it was the first year of its implementation at the university. The lessons were delivered as synchronous live sessions thorough Advancity Learning Management System (ALMS) which is the most used distance education platform at Turkish universities (Kocatürk-Kapucu & Uşun, 2020). Attendance in the live sessions was not mandatory, so the recorded lessons were available on the platform for the students who wanted to watch later or again. However, the students were given a classic written test with multiple-choice questions at the end of the semester. That is the assessment was not conducted online due to the legal restrictions. The scale that was used to collect the data was delivered to 200 students, but 121 of them were included in the analysis since the others did not respond to the items properly or did not return the scale at all.

Data Analysis

The data were analyzed with SPSS 22 software. To find out the appropriate statistical analysis techniques (parametric or non-parametric tests), the assumptions of normality and homogeneity were tested. First, the Kolmogorov-Smirnov test was conducted to assess the normality of the data since parametric testing requires normal distribution (Martin & Bridgmon, 2012, p. 35, 144) and the results are given in Table 2.

Table 2. The Results for Kolmogorov-Smirnov Test

Values		The scale total
N		121
Normal Parameters	$\bar{x}$	2.95
	sd	.913
Kolmogorov-Smirnov Z		.062
p		.200*

* p>.05

As understood from Table 2, the data show normal distribution (p= .200) which means that the first condition for parametric testing is met. As the second step, the homogeneity of the data was tested for each of the variables, and the results were considered significant at the level of p>.05 (Lodico et al., 2006; p. 256). The test results show that the requirement for homogeneity is met with the following variables: gender (p=.34), having a personal computer (p=.53), average time spent on the internet per day (p=.11), and the preference for distance education (p=.79). However, the assumption of homogeneity is rejected for these two variables: having free internet access or not (p=.01) and having taken a distance education course before or not (p=.02). Consequently, nonparametric tests are warranted in the analysis for these two variables whereas parametric testing is conducted for the others (Bryman & Cramer, 2005, p. 144). In short, Mann Whitney U Test, Independent Sample t -Test, and One-Way ANOVA were conducted to analyze the data, and the results of the tests were considered statistically significant at the level of p<.05 (Bryman & Cramer, 2005, p. 146-147).

Research Ethics

The data were collected from the students after they completed the course and the evaluation procedure. The participation was completely voluntary, and the students were not asked for any information related with their identity. Also, necessary permissions were taken from the school to collect data and from the researcher to utilize the data collection tool.

FINDINGS

This section introduces the findings of the study based on the research questions. The first one was stated as "To what extent the students are satisfied with taking the English Course with distance education?" The means for the Scale of English Language Course Curriculum Conducted by Distance Education Scores are displayed in Table 3.

Table 3. Means for the Scale of English Language Course Curriculum Conducted by Distance Education

Factors	$\bar{x}$	*sd*
Context	2.97	1.01
Input	2.92	.98
Process	3.28	.93
Product	2.73	1.02
The Scale Total	2.95	.91

According to Table 3, the mean score ($\bar{x}$) of the total scale is 2.95 which can be interpreted that the participant students are quite satisfied with the course in general. When the factors are considered separately, it is seen that the students are pleased with the process at most ($\bar{x}$=3.28). Moreover, it is understood that they stated low levels of satisfaction with the context ($\bar{x}$=2.97), input ($\bar{x}$=2.92), and product ($\bar{x}$=2.73) of the distance English course. In short, it can be concluded that the students are content with their experience of distance English course although the mean scores show the low levels of satisfaction even if they do not refer to dissatisfaction. Table 4 shows the participant students' preferences for the English language course conducted via distance education which also gives a clue about their satisfaction levels with it.

Table 4. Frequencies of the Students' Preference for the English Language Course Conducted by Distance Education

Variables		n	f (%)
Their preference	I would rather have had this English course face-to-face.	67	55.4
	I am pleased to have had this English course via distance education.	48	39.7
	Missing	6	0.5
Total		121	100

As seen in Table 4, 55.4% of the students (n=67) stated that they would rather have had the English course face-to-face whereas 39.7% of them (n=48) were pleased to have taken it as a distance education course. That is why most of the students find face-to-face language instruction as a more satisfactory mode of learning considering their experience with distance education for the English language course.

The second research question asks about "the strengths and the parts to be improved in the English Course program that was conducted by distance education". The means for the items within each of the factors (context, input, process, and product) are presented in the following tables. First, Table 5 displays the findings for the context of the course.

Table 5. Means for the Items about the Context of the English Language Course Conducted by Distance Education

Items	$\bar{x}$	sd
1. The length of the course is enough to achieve the objectives.	3.27	1.16
2. The objectives of the program are responsive to the student needs.	3.07	1.26
3. The program is appropriate for the students' language levels.	3.05	1.21
4. The objectives of the program are responsive to student expectations.	2.96	1.22
5. The program is complimentary for the other courses.	2.88	1.16
6. The English course conducted by distance education develops English knowledge.	2.59	1.23
Total	2.97	1.01

As shown in Table 5, the mean score for the context is 2.97 which means that there is neither a real dissatisfaction nor full contentment with this dimension of the distance education English course. That is why the participant students are indecisive about the suitability of the length ($\bar{x}$=3.27) or the objectives of the course since they are not sure if it meets their needs ($\bar{x}$=3.07) or expectations ($\bar{x}$= 2.96). Moreover, they are hesitant about the appropriateness of the course program for their language levels ($\bar{x}$=3.05) and they do not think the program is

relevant to their other courses ($\bar{x}$=2.88), or it helps to develop their English knowledge ($\bar{x}$=2.59). Table 6 presents the means of the items with which the students evaluated the input provided in the course.

Table 6. Means for the Items about the Input of the English Language Course Conducted by Distance Education

Items	$\bar{x}$	sd
1. The number of tests uploaded in the portal is enough.	3.25	1.15
2. The content of course is sufficient.	3.10	1.11
3. The learning resources and materials used in the portal are sufficient.	2.98	1.11
4. The portal provides enough resources to improve English listening skills.	2.91	1.15
5. The portal provides enough resources to improve English grammar.	2.88	1.18
6. The portal provides enough resources to improve English reading skills.	2.86	1.23
7. The portal provides enough resources to improve English writing skills.	2.76	1.17
8. The portal provides enough resources to improve English speaking skills.	2.70	1.20
Total	2.92	.98

As seen in Table 6, the mean score for this dimension is 2.92 which indicates that the participant students express some degree of dissatisfaction with the content provided in the distance education English course. Although they seem more positive about the number of the tests provided in the portal ($\bar{x}$=3.25) and overall course content ($\bar{x}$=3.10), they are obviously hesitant about the sufficiency of the learning resources and materials ($\bar{x}$=2.98). Moreover, it is understood that they find the resources for writing ($\bar{x}$=2.76) and speaking ($\bar{x}$=2.70) less sufficient than the ones for reading ($\bar{x}$=2.86), listening ($\bar{x}$=2.91), or structural knowledge ($\bar{x}$=2.88). Table 7 shows the findings related to the process of the English course conducted by distance education.

Table 7. The Means for the Items about the Process of the English Language Course Conducted by the Distance Education

Items	$\bar{x}$	sd
1. All exams are held without any problems throughout the course.	3.49	1.18
2. The instructors carry out the course in accordance with its objectives.	3.40	1.16
3. The instructors use the appropriate teaching methods for the topic/objective.	3.33	1.20
4. The instructor explains the topic clearly in the portal videos.	3.33	1.07
5. The instructors utilize the materials effectively.	3.24	1.13
6. It is easy to ask questions to the instructors.	3.23	1.16
7. Any problem during the implementation of the program is cared for a proper solution.	3.22	1.06
8. The instructors try out ways to help to teach the topic easily.	3.20	1.21
9. The tests and materials provided in the portal are used to consolidate the topic.	3.10	1.16
Total	3.28	.93

Table 7 shows that the mean score for the process of distance education English course is 3.28, and this is the most satisfactory dimension according to the students' perceptions. When the means for each item about the process of the course are considered, it is understood that there is a satisfaction with the process although there is also room for the improvement. Almost all the items about the process are directly related to the course instructors which could be the source of relative satisfaction expressed by the students. It is seen in Table 7 that the most satisfying aspects of the process are the implementation of the exams ($\bar{x}$=3.49) and the instruction of the course in accordance with the objectives ($\bar{x}$=3.40). Furthermore, the way the instructors used the course materials ($\bar{x}$=3.24) and their teaching methods ($\bar{x}$=3.33) in addition to their explanations for the topics ($\bar{x}$=3.33) are perceived quite positively. The students are also pleased with consulting the instructors for their questions ($\bar{x}$=3.23), and the problem-solving approach adopted throughout the course ($\bar{x}$=3.22). Finally, it can be concluded that the students believe the instructors should try out other ways to ease their learning ($\bar{x}$=3.20) and the materials, and resources should be more sufficient for consolidation purposes ($\bar{x}$=3.10). Table 8 presents the means for the items that evaluate the product of the English course conducted by distance education.

Table 8. Means for the Items about the Product of the English Language Course Conducted by Distance Education

Items	$\bar{x}$	sd
1. The program has improved my memorial strategies for vocabulary.	2.87	1.14
2. The program helps to improve the ability to guess the meaning of unknown vocabulary in the texts.	2.83	1.13
3. The program has improved my reading comprehension skills.	2.83	1.17
4. The program has improved my distance education skills.	2.81	1.20
5. I am pleased with attending this program.	2.80	1.23
6. I believe that this program was beneficial for me.	2.77	1.22
7. I improved my vocabulary learning strategies at the end of the program.	2.76	1.17
8. The program has increased my interest in English.	2.76	1.23
9. I think the program has met its objectives.	2.75	1.18
10. At the end of the program I reached the level to utilize the strategies for using the proper vocabulary.	2.68	1.20
11. At the end of the program I reached the level to express myself in written English.	2.60	1.22
12. At the end of the program the students reach the level that is required in their undergraduate program.	2.55	1.21
13. At the end of the program I improved my communication skills in English.	2.55	1.20
Total	2.73	1.02

Table 8 presents that the overall mean for the items about the product of the English language course conducted by distance education is 2.73, and it refers to a dissatisfaction with this dimension. Although the means for every item indicate a tendency for indecisiveness, it is understood that the students demand improvement in each aspect. The most satisfactory outcome of the distance education English course is related to the vocabulary learning since the participant students believe that they improved their memory strategies ($\bar{x}$=2.87) and their ability to figure out the meaning of new words from the context ($\bar{x}$=2.83) at the end of the course. The course is also acceptable considering their enriched vocabulary learning strategies ($\bar{x}$=2.76). However, it is seen that the students do not regard the course much effective in terms of their progress in the productive skills as the mean (x) is 2.60 for writing and 2.55 for communication whereas it is 2.83 for reading. Moreover, they think that the course did not facilitate their English well enough for the requirements of their undergraduate program ($\bar{x}$=2.55), and they are uncertain about meeting the objectives throughout the program ($\bar{x}$=2.75) and their happiness about attending to the course ($\bar{x}$=2.80) or its benefits ($\bar{x}$=2.77). Finally, they believe that the distance education English course made a modest contribution to their distance education skills ($\bar{x}$=2.81) and to their interest in learning English ($\bar{x}$=2.76).

The third research question was expressed as “Do the students’ perceptions vary in terms of their genders, having a personal computer or free internet access or not, having taken a distance education course before or not, the average time they spend on the internet daily and their preference of distance education for the course?”. The results for the independent sample t-test which was conducted to find out if there are any significant differences in the students’ satisfaction levels in terms of their gender, having a personal computer, or their preference for distance education are given in Table 9.

Table 9. Independent Sample t-Test Results

Variables	Groups	n	$\bar{x}$	sd	t-test		
					t	df	p
Gender	Female	69	2.88	.950	-.940	119	.349
	Male	52	3.04	.862			
Having a personal computer	Yes	71	3.06	.926	1.638	113	.104
	No	44	2.78	.871			
Preference for distance education	Face-to-face	67	2.65	.840	-4.217	113	.000*
	Distance education	48	3.35	.909			

* p<.05

According to Table 9, the participant students’ satisfaction with the course varies significantly in terms of their preference for distance education (p=.00). When the means are considered, it is understood that the students who

are happy to have had the course via distance education are more satisfied ($\bar{x}$=3.35) than the ones who would rather have had face-to-face sessions ($\bar{x}$=2.65). Although there is no statistically significant difference according to the students' gender (p=.34) or having a personal computer or not (p=.10), it is seen that the males have expressed a higher level of satisfaction with the distance education English course ($\bar{x}$=3.04) than the females ($\bar{x}$=2.88). Moreover, the participants with a personal computer have stated more satisfaction ($\bar{x}$=3.06) than the ones who lack this facility ($\bar{x}$=2.78). The results of the Mann Whitney-U Test which was used to determine if there is a significant difference in the participants' satisfaction levels in terms of their having free internet access or having taken a distance education course before are presented in Table 10.

Table 10. Mann Whitney-U Test Results

Variable	Groups	N	Mean of Ranks	Sum of Ranks	U	z	p
Having free internet access	Yes	86	59.43	5111.00	1370.00	-.536	.592
	No	34	63.21	2149.00			
	Total	120					
Having taken a distance education course before	Yes	35	72.87	2550.50	1089.50	-2.375	.018*
	No	86	56.17	4830.50			
	Total	121					

* p<.05

The findings presented in Table 10 indicate that there is a statistically significant difference in the students' satisfaction with the English course in terms of their previous distance education experience (p=.01). Accordingly, the participants who had taken a distance education course before are more content than the ones who took this English course as their first distance education experience. However, it is seen that the accessibility to free internet does not make a significant difference in their satisfaction with the program (p=.59). The results for the Kruskal Wallis-H Test which was conducted to reveal if there is a significant difference in the students' satisfaction level with the distance education course in terms of the average time they spend on the internet per day are shown in Table 11.

Table 11. Kruskal Wallis-H Test Results

Variables	Groups	N	Mean of Ranks	X^2	df	p
The average time spent on the internet per day	0-2 hours	27	67.39	1.660	2	.436
	3-5 hours	66	58.37			
	6 hours+	26	56.46			
	Total	119				

* p<.05

According to Table 11, the participants' satisfaction with the distance education course does not vary significantly in terms of the average time they spend on the internet per day (p=.43). Still, the results of the analysis have revealed a decrease in their contentment with an increase in the time they spend on the internet. In other words, they tend to get more pleased with the course as they spend less time on the internet.

DISCUSSION & CONCLUSION

This section focuses on the results of the study that are briefly summarized and discussed in the light of the related literature asmentioned before. First, despite a low level of satisfaction, the participant students are quite satisfied with their experience of distance education English course. Still, most of the students find face-to-face language instruction as a more satisfactory mode of learning. This outcome is not surprising since it is consistent with most of the studies in literature (Doğan, 2020; Eroğlu & Kalaycı, 2020; Gürer et al., 2016; Işıklı, 2017; Metin et al., Pepeler et al., 2018; 2017; Şen-Ersoy, 2015; Tugen et al., 2010). Kocatürk-Kapucu and Uşun (2020) state that there is a dramatic increase in the use of distance education particularly for 5i courses at Turkish universities since 2010. They also conclude that there is not unity in terms of distance education applications among higher education institutions (Kocatürk-Kapucu & Uşun, 2020). Therefore, it is a new experience for all parties: the institutions, instructors, and learners which means that they need time for professionalization. Besides, it is understandable that Turkish students who have been exposed to face-to-face education up until the tertiary level

prefer it to the distance education. As they do not have much awareness of distance education applications, they do not consider such classes as a proper course. Thus, they do not give much importance to them or follow the lessons regularly (Metin et al., 2017; Yaman, 2015). As a result, such issues may prevent the effective learning and cause students to evaluate such distance education courses negatively in spite of their relative advantages. Second, there is neither a real dissatisfaction nor full contentment with the context of the distance education English course. The students are indecisive about the suitability of the length or the objectives of the course since they are not sure if it meets their needs or expectations. Moreover, they are hesitant about the appropriateness of the course program for their language level, and they do not think the program is relevant to their other courses or it helps to develop their English knowledge. These findings related to the context are consistent with the study conducted by Pepeler et al. (2018) who used the same scale to evaluate the distance education English course at a state university in the eastern part of Turkey, and it revealed that the participant students had negative perceptions about its context. This dissatisfaction can be explained with the last-minute transitions from face-to-face classes to distance education.. Not having proper preparation for a distance education English course or necessary teaching skills, teachers tend to make use of the program, materials, methods, and techniques they have designed for face-to-face courses (Gürer et al., 2016). It is not possible to conduct a needs analysis, either. Besides, the course is offered completely in the same way with the same content to all learners from various faculties and programs with different needs and expectations. Consequently, it gets tougher to achieve the course objectives or meet the learner needs.

Third, the participant students express some degree of dissatisfaction with the content provided in the distance education English course. Although they seem more positive about the number of tests provided in the portal and overall course content, they are hesitant about the sufficiency of the learning resources and materials. Moreover, they find the resources for writing and speaking less sufficient than the ones for reading, listening, or structural knowledge. This is a compatible finding with the other studies in literature as well (Eroğlu & Kalaycı, 2020; Işıklı, 2017; Pepeler et al., 2018; Şen-Ersoy, 2015, Şirin & Tekdal, 2015). Generally, the quality of the materials is problematic rather than quantity. Students do not think that they can benefit from the materials to develop their foreign language skills (Pepeler et al., 2018) and it has also been indicated that distance education courses are less efficient to improve the productive skills than the receptive ones (Doğan, 2020) which could be a natural consequence of lacking effective interaction and constructive feedback (Eroğlu & Kalaycı, 2020).

Fourth, there is a dissatisfaction with the product of the distance education English course. Moreover, Pepeler et al. (2018) concluded that product was the least satisfying factor in their study. Therefore, it is possible to deduce that students are highly skeptical of the course outcomes. The findings related to this dimension are also parallel to the results for the content as explained-above. For instance, the students do not regard the course much effective in terms of their progress in the productive skills which can be linked to the quality of the materials focusing on speaking and writing in addition to the inconsistency in testing procedures since they are not tested on these vital language skills (Erfidan, 2019; Eroğlu & Kalaycı, 2020; Metin et al., 2017; Özgöl et al., 2017). Moreover, the students think that the course did not facilitate their English well enough for the requirements of their undergraduate program. Besides, they are uncertain about meeting the objectives throughout the program and their happiness about attending the course or its benefits. As discussed-before, most of the time, distance education courses are not designed efficiently based on learner needs, expectations, or differences (Yaman, 2015). As a result, students find lessons tedious, and so they tend to give up the regular attendances. There are also a considerable number of students who find it enough to go over the previous years' test questions before the exams without attending any of the classes throughout the semester (Metin et al., 2017). As absenteeism reduces students' achievement in distance education courses seriously, it is important to motivate and encourage them to participate regularly (Seven, 2012). On the other hand, the most satisfactory outcome of the distance education English course is related to vocabulary learning. The students believe that they improved their memory strategies and their ability to figure out the meaning of new words from the context at the end of the course. The course is also acceptable considering their enriched vocabulary learning strategies. This finding also makes sense since students are generally given classic written exams in which they are tested on their knowledge of vocabulary, structure, and basic reading skills with multiple-choice questions (Eroğlu & Kalaycı, 2020). Therefore, they may tend to develop their memory strategies which help to memorize word lists and structural rules. Moreover, the students believe that the distance education English course made a modest contribution to their distance education skills. Students are not mostly trained for distance learning skills, and they expect to have an orientation about the distance education platform (Erfidan, 2019); otherwise, they can improve themselves in a limited extent. The students also believe that the distance education course did not increase their interests in English at most. This perception is in

harmony with the findings of Şen-Ersoy (2015) and Erfidan's (2019) studies which conclude that students do not consider EFL courses as suitable for the distance education due to the lack of practice and interaction. As a result of it students perceive English as a course to pass rather than a skill to get (Eroğlu & Kalaycı, 2020).

Fifth, although process is the most satisfactory dimension, there is a room for improvement as well. It is seen that Pepeler et al. (2018) came across the same result in their study since their participants were pleased with the process of the distance education course. The course instructors could be the source of this relative satisfaction. The most satisfying aspects of the process are the implementation of the exams and the instruction of the course in accordance with the objectives. Furthermore, the way the instructors used the course materials and their teaching methods in addition to their explanations for the topics are perceived quite positively. The students are also pleased with consulting the instructors for their questions and the problem-solving approach adopted throughout the course. These findings are also supported by Şen-Ersoy's (2015) study which reports that the participants were glad about their instructors' interest, enthusiasm, and attempt to interact with them. Thus, it is possible to conclude that instructors' teaching style in a distance education course has a considerable impact on the level of students' satisfaction with the program. However, Gürer et al. (2016) state that instructors are usually supported about technical issues by their institutions thanks to distance education units at universities, but they do not get enough assistance to improve their teaching skills for the distance education (Erfidan, 2019).

Lastly, the participant students who are happy to have had the course with the distance education are more satisfied with it than the ones who would rather have had face-to-face sessions. This is a natural consequence as dissatisfaction with the distance education leads learners to face-to-face courses which were revealed by Metin et al. (2017) as well. Moreover, the participants, who had taken a distance education course before, are more satisfied than the ones who took this English course as their first distance education experience. This finding shows that the students might have coped with the challenges of distance education with ease thanks to their previous experience. In other words, they were familiar with distance learning, and they were already equipped with the key skills and strategies. Therefore, they might have used this experience to have benefit more from the course which might have increased their success and satisfaction. However, it is seen that the accessibility to free internet does not make a significant difference in the satisfaction with the program which is consistent with the findings of Pepeler et al. (2018) whereas Metin et al. (2017) found a significant connection between two variables. This can be explained with the availability of free wireless internet and computer labs on campus for the participants, and sothey might not have considered internet access as a challenge for their distance education course. Similarly, the participants' satisfaction with the distance education course does not vary significantly in terms of the average time they spend on the internet per day. Still, it has been revealed that they tend to get more pleased with the course as they spend less time on the internet. Yaman (2015) states that students tend to get distracted by social media while watching their distance education lessons. It might be assumed that the learners spending more time on the internet found it more difficult to focus on the lessons due to a similar problem. Furthermore, the males have expressed a higher level of satisfaction with the distance education English course than the females, and the participants with a personal computer have stated more contentment than the ones who lack this facility even though these differences are not statistically significant. It is also consistent with the findings of various papers which studied gender as a variable (Işıklı, 2017; Pepeler et al., 2018; Seven, 2012; Şirin & Tekdal, 2015).

In a nutshell, this paper concludes that the participant students are quite pleased with their experience of distance education English course which indicates various aspects to be improved. The best part of the program seems to be the process thanks to the contribution of the course instructors. However, these aspects such as the course objectives, materials, testing procedures, productive skills, learners' and teachers' digital literacy and distance education competencies need to be promoted to satisfy learners more.

Finally, some suggestions are made in accordance with the conclusions and discussions above. It is crucial to invest in the instructors since they play a key role in the implementation of distance education courses. They should be trained for the necessary digital and pedagogical skills to design and conduct efficient distance education English courses. They should be given enough time to get prepared and supported in terms of technical issues and provided with a rich collection of materials. It should be the same for students as well. The distance education platform and course content should be introduced to them so that they can benefit from the lessons better. Since 5i English courses address various learners from different faculties and programs, a needs analysis will be useful to design a course that meets their needs and expectations. Such a course will require diversity and include interesting and motivating content for most of the learners, and this will eventually encourage them to participate regularly. It is seen that distance education English courses fail to develop productive skills in general, so these

courses should be designed to focus on these skills more. Students should be given more opportunities to practice speaking and writing. In addition, a system should be set up to provide them with constructive feedback on their production. Testing procedures should also include these skills to motivate students. Moreover, students need to communicate with their instructors directly. Therefore, the course should be designed to include some face-to-face sessions regularly along with the distance education classes. At least, synchronous sessions can be preferred to allow interacting with the instructor. This will provide a smooth transition from the traditional face-to-face lessons to distance education more effectively without developing negative attitudes towards such courses. This study has also used a quantitative data collection instrument to describe the current situation from the learners' perspectives. Therefore, it will be possible to get a deeper understanding if qualitative studies are also conducted to get both learners' and instructors' views about their experience with distance education English courses.

Statements of Publication Ethics

This paper does not require an ethics approval document according to ULAKBIM's (TR INDEX) new coverage criteria as the data were collected before 2020.

Conflict of Interest

There is no conflict of interest to declare in this study.

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Bartın University Journal of Faculty of Education BUEFAD

2023, Volume 12, Issue 1, 47-56
dergipark.org.tr/buefad
DOI: 10.14686/buefad.977978

Instructor's Written Feedback in Emergency Remote Teaching: EFL Learners' Perspectives

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Research Article
Received: 03.08.2021
Revised: 06.12.2021
Accepted: 13.04.2022

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ABSTRACT

In language education, instructor's feedback is considered to be of high value as it provides learners with individualized attention. Regarding the absence of personal interaction between learners and instructors in remote teaching, it is expected that instructor's feedback plays a more significant role compared to the case in face-to-face education because it does not only help to increase learners' performance in the target language and but it also serves as a tool in building a strong relationship between learners and instructor. Based on this, the present paper which was designed as a case study attempted to reveal university level English as a foreign language (EFL) learners' perspectives on written feedback given by their instructor on their writing assignments on the distance education platform of the university in emergency remote teaching. The data were collected through interviews conducted with eight English preparatory class students and the instructor's research diary. Thematic analysis was carried out on the collected data. The findings showed the interviewees had positive viewpoints about the instructor's written feedback. They stated that the instructor's feedback had an interpersonal side, gave them affective support and helped them improve in the target language. Moreover, the use of online distance education platform for giving feedback was found to be useful by the interviewees in that it provided the learners with the opportunity to have access to the feedback documents whenever they wanted. The results may imply new insights into the way foreign language instructors give written feedback.

Keywords: Written feedback, emergency remote teaching, language education.

Acil Uzaktan Öğretimde Öğretmenin Yazılı Geri Bildirimi: Yabancı Dil Olarak İngilizce Öğrenenlerin Görüşleri

ÖZ

Dil eğitiminde öğretmenin geri bildirimi, öğrencilere bireyselleştirilmiş ilgi sağladığından oldukça değerli kabul edilir. Uzaktan eğitimde öğrenciler ve öğretmen arasında kişisel etkileşim yokluğu hesaba katıldığında, öğretmen tarafından sağlanan geri bildirimlerin yüz yüze eğitime göre daha önemli bir rol oynaması beklenir. Çünkü bu geri bildirimler sadece öğrencilerin performansının artmasına yardımcı olmakla kalmaz, öğrenciler ve öğretmen arasında güçlü bir ilişki kurmak için de araç görevi görür. Buna dayanarak, vaka çalışması olarak tasarlan bu makalede, üniversite düzeyinde yabancı dil olarak İngilizce öğrenen öğrencilerin, acil uzaktan öğretimde üniversitenin uzaktan eğitim platformundaki yazı ödevlerine öğretmenleri tarafından sağlanan yazılı geri bildirimlere ilişkin bakış açıları ortaya konulmaya çalışılmıştır. Veriler, sekiz İngilizce hazırlık sınıfı öğrencisi ile yapılan görüşmeler ve öğretmenin araştırma günlüğüyle toplanmıştır. Elde edilen veriler tematik olarak analiz edilmiştir. Bulgular, öğrencilerin yazılı geri bildirimler hakkında olumlu görüşlere sahip olduğunu göstermiştir. Öğrenciler, öğretmen tarafından sağlanan geri bildirimlerin kişiler arası bir yönü olduğunu, onlara duyuşsal destek verdiğini ve hedef dilde gelişmelerine yardımcı olduğunu ifade etmişlerdir. Ayrıca üniversitenin çevrim içi uzaktan eğitim platformunun geri bildirim vermek için kullanılması, öğrencilere geri bildirim belgelerine istedikleri zaman ulaşma fırsatı sunması nedeniyle yararlı bulunmuştur. Çalışmanın sonuçları dil öğretmenlerinin yazılı geri bildirim verme yöntemlerine ilişkin yeni bakış açıları sağlayabilir.

Anahtar kelimeler: Yazılı geri bildirim, acil uzaktan öğretim, dil eğitimi.

To cite this article in APA Style:
Balıkcıoğlu Akkuş, G. & Altay, İ. F. (2022). Positive feedback and written corrective feedback in emergency remote teaching: EFL learners' perspectives. *Bartın University Journal of Faculty of Education, 12*(1), 47-56. https://doi.org/10.14686/buefad.977978

INTRODUCTION

Since English is the most frequently used language for international communication and business, many non-English speaking countries have been under the global impact of English for many years and Turkey is not an exception. Accordingly, keeping up with the latest developments in foreign language education by developing up-to-date education policies and practices has become a requirement. Together with the increase in partly-English and fully-English departments in higher education, learning English is seen as a must by university students to achieve academic success and to have better job opportunities in the future (Doğançay-Aktuna & Kızıltepe, 2005). Hence, there is a great deal of effort to equip learners with necessary language skills and to improve their linguistic and communicative competence, but this process is not without problems.

In Turkey, one of the main problems during learning and teaching English as a Foreign Language (henceforth EFL) is that the selected coursebook is often followed as the syllabus (Çakır, 2007). Such a teaching program falls short of including contextual factors. According to Bell (1983), English instructors' role in this process is to be the consumers of what is available to them and follow a predetermined route. The ready-made selection and grading of content are likely to ignore learners' individual needs as it causes the one-size-fits-all attitude to be dominant. To diminish the negative effect of this situation, as Hyland and Hyland (2006) state, giving feedback to students in any form is invaluable in that it provides individualized attention which is otherwise almost impossible in the classroom environment.

In this study, the researchers attempted to investigate university level English learners' perspectives on written feedback, which consists of the instructor's corrections and positive comments on the L2 paragraphs of the students. Due to the coronavirus (COVID-19) pandemic, Turkey has made a sudden shift to emergency remote teaching (henceforth ERT). In this mode of teaching, instruction is completely carried out through the use of remote teaching solutions which are easy to set up and available during an emergency circumstance (Hodges, Moore, Lockee, Trust & Bond, 2020). However, time constraints, limited interaction and difficulty in monitoring students pose major problems (Zhang, 2020), so it is not wrong to say that meeting learners' diverse needs, which is already a challenging task for an EFL instructor in face-to-face education, is much more difficult in emergency remote teaching. Moreover, the necessity to adapt quickly to the new situation in which there is no physical interaction could make learners take a negative attitude towards language learning process. The purpose of this paper is thus to examine whether the instructor's written feedback can be useful in terms of answering individual needs and having the students develop a more positive attitude to language learning during emergency remote teaching.

LITERATURE REVIEW

Feedback, which enables learners to see how other people evaluate their work and to learn from these comments, is regarded as an essential part of the L2 writing process in that it has the potential both for enhancing learners' writing performance and their motivation (Hyland, 2003; Hyland and Hyland, 2006). Although verbal responses provided by instructors and suggestions that learners receive from their classmates in relation to their writing tasks are highly favored as types of feedback in the L2 writing process, instructors' written feedback still maintains its importance. Instructors feel that they need to write comments on students' writing tasks so that they can respond to students' efforts as a reader and justify the marks they give. Similarly, written feedback is also appreciated by most learners since it is seen as vital to their development (Hyland, 2003). The crucial point here is to ensure that feedback is given effectively. As Hattie and Timperley (2007) emphasize, besides its being easy to understand and having a clear aim, effective feedback must be consistent with students' previous knowledge and provide sensible connections.

In the contexts where English is taught as a foreign language, continuous instructor-student interaction is of utmost importance because learners have limited exposure to the target language outside the class, so the instructor may be the only person with whom they can practise the language, talk about their learning process and evaluate the learning outcomes. In online teaching, owing to the absence of face-to-face interaction between the instructor and learners, feedback is considered to serve as a useful practice since it helps to individualize the learning process, strengthen the instructor-student relationship and increase the students' academic performance (Bonnel, Ludwig & Smith, 2007; Leibold & Schwarz, 2015; Pyke & Sherlock, 2010). As suggested by Leibold and Schwarz (2015), while giving feedback in this mode of teaching which is different from traditional course delivery, there are some points that the instructors must keep in mind. Accordingly, by addressing the learners by their names, the instructor must provide frequent, immediate, balanced and specific feedback, use a positive tone and ask questions to encourage thinking.

Among feedback types, corrective feedback is the most common one (Hattie & Timperley, 2007) and it mostly refers to corrections of grammatical errors in learners' oral and written tasks. It can be either direct or indirect. In direct corrective feedback, the instructor crosses out the wrong part and provides the correct form, and s/he can also include written meta-linguistic explanation by giving grammar rules and showing examples of correct usage. In indirect feedback, on the other hand, the instructor identifies the error but does not provide the correction. Instead, s/he can underline the error and use a code to show the type of the error, and the students are expected to correct the error with their own efforts (Bitchener & Knoch, 2010). However, when we look at the literature in the foreign and second language education field, we see that corrective feedback is a matter of debate. While some researchers (e.g. Sheppard, 1992; Truscott, 1996; Truscott; 2007) are against the use of written corrective feedback by claiming that it does not promote accurate writing, there are also various studies (e.g. Chandler, 2003; Ferris, 2006; Bitchener & Knoch, 2008) supporting the idea that it has potential to improve learners' grammatical accuracy in their writing. Despite this controversy, written corrective feedback is still a common practice in language classes. According to Kerr (2020), the main aspect to be considered while giving this type of feedback is that we, as instructors, should not only focus on learners' grammatical errors but also the content and organization of their writing. The results of the research conducted by Biber, Nekrasova and Horn (2011) demonstrate that the learners' improvements in grammatical accuracy were higher when feedback focused on both content and form.

Positive feedback, which is the other focal point of the present research, means the instructor's appreciative remarks showing the strengths of learners in relation to their writing tasks. Pedagogically, positive feedback is of high value because it gives affective support by fostering motivation, and it encourages learners not to give up (Ellis, 2009). Therefore, responding to learners' writing must go beyond correcting their errors and learners must also be informed of what they do right in their writing (Vengadasamy, 2002; Shvidko, 2020). Through positive feedback, the instructor has a chance to build a more supportive relationship with learners and when learners notice improvements in their efforts to write in English, their self-confidence is boosted.

In Hyland's study (2001), which investigates English learners' perspectives on feedback in distance learning, we see a variation regarding the learners' feedback preferences, but generally most of them were quite pleased with the feedback provided by their tutors and the tutors' comments about organization, structure, grammar and content were found especially more useful compared to the comments related to spelling, punctuation and academic conventions of writing. Another study conducted by Simpson (2006) which explores whether instructor's feedback changes EFL learners' attitudes towards writing reveals that the motivating feedback made them feel more confident as writers. The results of the study also show that when feedback included comments on content, the learners felt more satisfied than when feedback focused on only grammatical errors, but they still wanted their grammatical errors to be corrected by their instructor.

The results of the study conducted by Hişmanoğlu and Hişmanoğlu (2009) in the distance learning context in Turkey indicated that the students perceive teachers' feedback as beneficial because feedback enables them to discern their weaknesses. The students also believe that they can develop a more positive attitude towards learning process if their teachers show interest in their progress, which will most probably facilitate teacher-student dialogue. When the studies (Atmaca, 2016; Bozkurt & Acar, 2017; Şentürk, 2019), which focus specifically on the perceptions of the learners in Turkish EFL context are examined, it is seen that the learners favor receiving corrective feedback from their teachers.

Research Question

The present study was conducted to explore the university level EFL learners' perspectives on the instructor's written feedback during emergency remote teaching and in accordance with this purpose the following research question was prepared:

1. What are the preparatory class EFL learners' viewpoints on written feedback provided by their instructor on an asynchronous distance education platform called Learning and Content Management System (Moodle)?

METHOD

Research Design

Considering the exploratory nature of the research questions, this paper was designed as a case study that employed qualitative methods to gain a better understanding of the target EFL learners' perspectives on written feedback provided by the instructor in emergency remote teaching. The rationale behind the adoption of a qualitative case study is that, as Merriam (2009) states, "researchers are interested in insight, discovery, and interpretation rather than hypothesis testing" (p. 42). Since an important characteristics of a qualitative case study

is in-depth data collection, multiple sources of information such as "observations, interviews, documents and audiovisual material" (Cresswell, 2007, p. 75) are involved in this process. Accordingly, in the present research, the qualitative data were obtained through semi-structured interviews and the instructor's research diary.

Setting and Participants

The research was conducted at one of the foundation universities in Ankara with eight students who were enrolled in basic level compulsory English preparatory program in the fall term of 2020-2021 academic year during emergency remote teaching. The objective of this program is to make learners who have a limited knowledge of the target language achieve language proficiency at A2+ level based on Global Scale of English (henceforth GSE) objectives. Since the first author of the study was also the instructor providing feedback, the participant students were selected from the class she teaches. To decide on the participants, purposive sampling technique was employed. In this sampling technique, participants are chosen on purpose owing to the characteristics they have and the aim is to achieve a greater understanding about the research problem (Etikan, Musa & Alkassim, 2016). For this reason, eight students who were given regular written feedback on their writing assignments by the instructor on the distance education platform of the institution (Learning and Content Management System (Moodle)) were selected as the study sample. As it was aimed to achieve variation among the participants, the study included the students differing in terms of gender, departments and the scores of the first writing exam that they took at the preparatory class.

Table 1. Information about the Participants

Student	Gender	Department	Writing Exam Score (15 points)
1	Male	Electrical and Electronics Engineering	11
2	Female	Psychology	12
3	Female	Psychology	13
4	Male	Political Science and International Relations	14
5	Female	Industrial Engineering	15
6	Male	Radio, Television and Cinema	7,5
7	Female	Law	11
8	Female	Physiotherapy and Rehabilitation	11

Data Collection

Semi-structured interviews were conducted with the participant students. As noted by Merriam (2009), while carrying out qualitative studies, semi-structured type is the most common one among the interview types. This type of interview is led by a set of questions and problems to be investigated and specific information is required from all interviewees. However, there is not a predetermined order of questions, so they can be used flexibly. In the present study, first of all, the researchers asked for an expert opinion to check whether the interview questions were appropriate to the purpose of the study and piloted the questions with a student from the class. After the necessary changes were made, data collection process started. Prior to the interviews, the questions were sent to the participants so that they could do some preparation and take notes. The research participants were asked how they felt while reading the instructor's feedback (Figure 1), what the benefits of written feedback were for their development and whether their attitude towards language learning process changed in line with the feedback they received since the beginning of the term. Taking the proficiency level of the students into account, Turkish was used as the interview language to avoid misunderstandings. Each interview was conducted online on Zoom and lasted approximately ten minutes. To develop a thorough understanding of the research problem, the instructor's diary, in which she wrote about the feedback process and the students' reactions, was also included as a data source. The content of the research diary was created based on the interactions between the instructor and the students in synchronous online lessons and the students' responses to feedback documents.

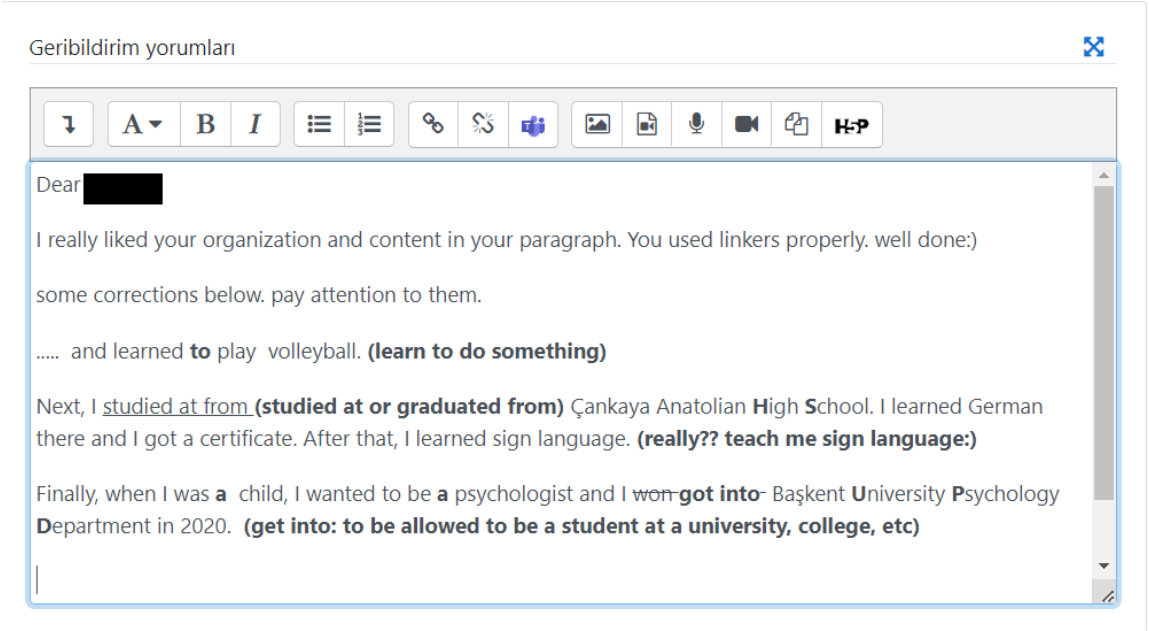

Figure 1. *A Sample of Feedback Document*

Data Analysis

After the recorded interviews were transcribed verbatim and translated into English, the researchers carried out a thematic analysis on the collected data in accordance with the purpose of the research. Thematic analysis is considered to be a useful method of qualitative data analysis in that it allows for determining patterns within and across data sets with regard to research participants' perspectives, behaviors, experiences and viewpoints, so it tries to reveal what participants do, feel and think (Braun & Clarke, 2017). In this study, as Braun and Clarke (2006) suggest, the researchers followed a six-phase approach to analyze the obtained data. First of all, they familiarized themselves with the data by reading and rereading the transcripts and generated initial codes relevant to the research questions. Next, they searched for themes in the codes to demonstrate meaningful and coherent patterns. After that, they reviewed the potential themes to check whether they work in relation to the data. Finally, they defined the themes and produced a final report based on the analysis. The same stages were followed to analyze the instructor's research diary.

Trustworthiness

To ensure the trustworthiness of the study, two strategies were followed: triangulation and member checking. Triangulation refers to the observation of the research problem from at least two different angles (Flick, 2004). Thus, in this study the researchers benefited from both the semi-structured interviews and the instructor's research diary so that they could compare these data sources and extend their knowledge about the research problem. As for the member checking, the interview transcriptions and the summary of the transcriptions were shared with the student participants. They were asked to confirm or revise their earlier statements.

Limitations of The Study

This study has some limitations because of its small-scale design. The first limitation is related to the number and English proficiency level of the interviewees. Only eight students from the low level English class were selected as the research participants. As for the second limitation, since all the interviewees received feedback about their writing tasks by the same instructor during the whole term, it might be expected that their perspectives on feedback show similarities to a great extent. If the study had been conducted with more participants differing in terms of their English level and the ones given feedback by different instructors, more valid results and detailed understanding of EFL learners' perspectives on written feedback and positive feedback could have been reached. Lastly, an independent coder during the coding process of the data was not included and this may affect the reliability of the study.

FINDINGS

Following the analysis of the qualitative data obtained from the semi-structured interviews through thematic analysis, the findings were presented under the titles of relevant themes. The quotes from the transcripts were

included to strengthen the interpretation of the data. The findings were enriched with the conclusions drawn from the instructor's research diary as well. Accordingly, university level EFL learners' perspectives regarding the instructor's written feedback in emergency remote teaching were summarized below.

The Role of Feedback As Affective Support

The interviewees verbalized that they felt pleased when they received positive comments such as "well done", "you have improved a lot", "I liked your organization", "rich content" about their writing tasks and stated that being appreciated by the instructor increased their self-confidence and helped them to develop a can-do attitude towards writing. As for written corrective feedback, none of the students voiced discontent. On the contrary, seeing their errors with corrections made the students more motivated not to repeat these errors in the upcoming writing assignments. The quotes below address this theme:

"You told me that I had good use of linkers in my paragraph. I really liked this comment and I tried to use them more in my writing assignments." (Interviewee 8)

"I feel more comfortable and motivated than before. I can make sentences more easily now." (Interviewee 7)

"When I read feedback about my first opinion paragraph, I felt bad. I shouldn't have made so many errors. This motivated me to write better. " (Interviewee 5)

"I am more eager to write because feedback shows me that I can write well and achieve more." (Interviewee 2)

Easy Accessibility to Feedback Documents

Another important point raised by the interviewed students was that the asynchronous distance education platform of the university from which the instructor benefited to give feedback allowed the students to record all their writing assignments and keep them in a file. Thus, the students were able to store each week's writing assignment with its feedback and when they started a new writing task, they examined the corrections of the former assignments and the instructor's comments, which gave them to opportunity to edit and review each new writing task in the light of the previous feedback. The students emphasized that written feedback provided on this platform is more memorable compared to paper based feedback and oral feedback. In this respect, interviewee 4 said that:

"Since all feedback is recorded in Learning and Content Management System, I can reread your comments and examine the corrections whenever I want. If you had given only oral feedback, I might not have remembered most of my mistakes." (Interviewee, 4)

The Significance of Feedback for Students' Improvement in The Target Language

The students remarked that they gained awareness of their strengths and weaknesses by means of the feedback they received regularly, so they found the corrections and suggestions made by the instructor in relation to their language use (grammar and vocabulary), content and organization necessary for their improvement. They articulated that feedback enabled them to reduce the frequency of committing the same errors while writing in English. The results of the analysis also show that what made the learners feel positive about the instructor's feedback is not only the progress they made in writing skill, but the transferability of what they learnt from feedback to the other aspects of the target language learning process as well. The interviewees explained their opinions about the significance of the instructor's feedback as in the following:

"*Thanks to feedback, I notice my strengths and weaknesses. For example, you usually tell me my organization is good. But I have problems in grammar. When I am writing, I cannot see my mistakes, but when you give me feedback, you say whether my sentences are right or wrong and how I can correct them."* (Interviewee 1)

"I try to write different paragraphs by using the corrected words and sentence structures. I see that my vocabulary knowledge has expanded." (Interviewee 5)

"If you didn't give feedback on our writing assignments, I would speak English less in class and participate less in class activities. Besides writing skill, my speaking skill got better." (Interviewee 3)

Interpersonal Side of Instructor's Feedback

In addition to the instructional and pedagogical value of feedback, the findings also revealed how the students perceived interpersonal side of instructor's written feedback during remote teaching process. Almost all

interviewees mentioned that one of the biggest drawbacks of distance education was that instructor and students were physically separate. Although the lessons were delivered in synchronous online classes where the students and instructor met in-real time, the instructor's individual attention to the learners was minimal due to class size, time constraints and loaded syllabus and it was uttered by some interviewees that this mode of teaching eliminated personal interaction. Therefore, they attached importance to feedback as it might be used as a tool to have a close relationship and personal communication with the instructor. The following quotes point to this theme:

"I think I introduced myself better thanks to writing assignments. I wrote several paragraphs about my life and you responded to them by asking some questions or making comments such as -Dear------ [the student's name], any restaurants you would suggest in Gaziantep? [the student's hometown] I cannot speak German. How did you learn it? [the student has a good knowledge of German and the instructor learnt it from a paragraph she wrote] (Interviewee 3)

"When I read the feedback, I feel like we are talking face-to-face. You always start feedback Dear…. [the student's name] You show interest in what I write and sometimes put emoticons. (Interviewee, 6)

The Instructor's Research Diary

Three significant themes emerged as a result of the analysis of the research diary. First, the findings indicated that the instructor's feedback was perceived as a means of building instructor-student dialogue. After getting the feedback, many students got in contact with the instructor to seek further clarifications, to take advice on how to improve their writing skill and so on. In this way, an ongoing dialogue was established between the instructor and the students. Second, receiving individualized attention in their L2 writing process encouraged the students to write more. Before the exams, they wrote extra paragraphs, sent them to the instructor and wanted to be provided with written feedback. Third, the researcher observed that some students were able to transfer from what they learned from the feedback on the writing assignments to speaking, which is the other productive skill. The comments and suggestions provided by the instructor to the students' written work had an effect on their oral production as well. All in all, the findings obtained from the instructor's research diary supported and complemented the statements of the interviewees.

DISCUSSION & CONCLUSION

The aim of the present study is to reveal EFL learners' perspectives on written feedback provided by their instructor on the distance education platform of the university during emergency remote teaching. The results of the analysis unearths that all the students in the study are content with the instructor's feedback and believe the necessity of feedback in their learning process of the target language, which is in line with what Hyland (2001 and 2003) states. When we look at the pertinent literature presented in this paper, it is recognized that interviewees' perspectives on positive feedback given by the instructor corroborate with the views of Vengadasamy (2002), Ellis (2009) and Shvidko (2020). The findings demonstrate that the positive comments that the learners received about their language use, content and organization in their writing tasks gave them affective support in terms of fostering motivation and increasing self-confidence.

As for the impact of written corrective feedback, the viewpoints of the students are in accordance with the studies (Chandler, 2003; Ferris, 2006; Bitchener & Knoch, 2008) which suggest that written corrective feedback has a role in improving grammatical accuracy in L2 writing. Based on the findings, it is seen that the students noticed some improvement in their L2 writing over time by means of the instructor's feedback. Furthermore, consistent with the instructor's observation notes stated in the research diary, some students said that they were able to use what they learnt from the instructor's written feedback in other aspects of language such as speaking skill and vocabulary knowledge. This can be considered to be a noteworthy result because it shows that the students benefited from the feedback. However, since the present research reflects only the perspectives owing to its qualitative nature, to what extent the students provided with written corrective feedback have improved their accuracy and whether there is a significant difference between their first writing task and the last one do not fall within the scope of this research.

In the field of English language teaching, there are a lot of studies (e.g. Simpson, 2006; Hamidun, Hashim & Othman, 2012; Agbayahoun, 2016) conducted in order to investigate the learners' perspectives on instructor's feedback, but in the present research, the researchers focused on how the instructor's feedback is perceived by the target EFL learners in the emergency remote teaching process. As it is known, this process includes the employment of several technological tools to carry out the course requirements. Thus, it is not surprising that while

talking about their feedback experiences, the students also mentioned the advantage of the online platform of the university designed for distance education in that it allowed them to save all feedback documents and to have access to them anytime.

Another important finding of this study is that the students recognized and appreciated the interpersonal aspect of the instructor's feedback. About this theme, the quotes belonging to the students indicate that the instructor responded to the students' paragraphs as a reader by providing personal commentaries, asking questions and sharing her own experiences. This finding is in line with Sommers (2013) who stresses that responding to students' texts should entail human dimension. By this means, instructors motivate and support their students by adopting the role of an interested reader and this nurtures the relationship between two sides.

Pedagogical Implications

Considering the findings discussed so far, several educational implications which address to what language instructors should do in relation to giving feedback can be drawn. First of all, they should be aware of the value of positive feedback in that it promotes effective learning by taking affective domain into account. Therefore, language instructors should not focus their attention only on identifying and correcting errors. They are advised to find what the learners' strengths are in L2 writing and respond to the students' texts accordingly. Secondly, even if face-to-face education starts, they should continue to make use of the online platforms to give feedback instead of relying on traditional ways. These platforms allow the learners to reach all their writing assignments whenever they want and so the learners have an opportunity for self-evaluation by comparing what they have written with what feedback they have received. Thirdly, in remote teaching the lack of individual attention to students which is caused mostly by physical distance is regarded as a big disadvantage, so instructor's responding to students' writing as a reader is worthwhile since it contributes to facilitating communication between instructor and students.

Statements of Publication Ethics

Ethical principles were followed in every stage of the study. The necessary ethical approval was obtained from Başkent University Academic Assessment Committee dated 06/01/2021 with the decision number of E-62310886-044-900. Prior to the interviews, the interviewees were asked to sign the informed consent form. All sources used in this research were cited in accordance with APA standards.

Researchers' Contribution Rate

First author collected and analyzed the data. Second author contributed to the interpretation of the findings. Both authors read and approved the final manuscript.

Conflict of Interest

There is no conflict of interest for this study.

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BARÜ Bartın University Journal of Faculty of Education BUEFAD

2023, Volume 12, Issue 1, 57-72
dergipark.org.tr/buefad
DOI: 10.14686/buefad.1134079

An Examination of Geography Perceptions of Primary School Teacher Candidates through Draw-Write-Tell Technique

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Research Article
Received: 21.11.2021
Revised: 11.10.2022
Accepted: 13.10.2022

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ABSTRACT

This study aimed to reveal the geography perceptions of primary school teacher candidates. The study group of the study that adopted a qualitative research method consisted of 160 primary school teacher candidates from all grade levels studying at a university in northern Türkiye during the 2021-2022 academic year. In the first stage of the study which was completed in three steps, students were asked to draw items that came to their minds with the word geography, clarifying their perceptions of geography. In the second stage, they were instructed to elucidate the connection between their drawings and geography term in detail through writing. In the third stage, unstructured interviews were conducted with 13 participants voluntarily selected from the study group to comprehend their motivations for choosing the drawings. Data were analyzed using the content analysis method. The drawing results demonstrated that it is possible to classify the broad geography perceptions of the students into nine different themes. In their drawings, the participants identified the most political events and phenomena with geography and reflected their perspectives in this direction. The reasons underlying the geography perceptions of the participants were divided into six different categories, including political and economic aspects. The study outcomes revealed that participants' geography perceptions took shape on the axis of modern-day political and economic issues, that geography is a critical power source at both local and global levels, and that it is a significative and determining factor for the future of living creatures.

Keywords: Geography perception, geography lesson, geography concept, draw-write-tell technique.

Sınıf Öğretmeni Adaylarının Coğrafya Algılarının Çiz-Yaz-Anlat Tekniğiyle İncelenmesi

ÖZ

Bu araştırmanın amacı, sınıf öğretmeni adaylarının coğrafya algılarını ortaya koymaktır. Nitel araştırma yönteminin benimsendiği araştırmanın çalışma grubunu 2021-2022 eğitim-öğretim yılında Türkiye'nin kuzeyinde yer alan bir üniversitede okuyan her sınıf düzeyinden 160 sınıf öğretmeni adayı oluşturmaktadır. Üç aşamada gerçekleştirilen çalışmanın birinci aşamasında coğrafya algılarını tespit edebilmek için öğrencilerden coğrafya denince akıllarına gelen şeyleri çizmeleri istenmiştir. İkinci aşamada çizimleri ile coğrafya arasındaki bağlantıyı ayrıntılı bir şekilde açıklayarak yazmaları istenmiştir. Üçüncü aşamada çalışma grubu içerisinden seçilen 13 gönüllü katılımcıyla çizimleri seçme nedenlerine yönelik yapılandırılmamış mülakatlar yapılmıştır. Verilerin analizinde içerik analizi yöntemi kullanılmıştır. Çizimlerden elde edilen sonuçlar, öğrencilerin genel coğrafya algılarının 9 farklı tema altında toplandığını göstermiştir. Katılımcılar çizimlerinde coğrafya ile en çok siyasi olay ve olguları özdeşleştirmiş ve bakış açılarını bu doğrultuda çizimlerine yansıtmışlardır. Katılımcıların coğrafya algılarının altında yatan nedenler siyasi ve ekonomik faktörler olmak üzere 6 ayrı kategoride toplanmıştır. Araştırma sonuçları, katılımcıların coğrafya algılarının günümüz siyasal ve ekonomik faktörler ekseninde şekillendiğini, coğrafyanın yerel ve küresel boyutta önemli bir güç kaynağı olduğunu ve coğrafyanın canlıların geleceğini belirleyici ve tayin edici nitelikte olduğunu ortaya koymuştur.

Anahtar kelimeler: Coğrafya algısı, coğrafya dersi, coğrafya kavramı, çiz-yaz-anlat tekniği.

To cite this article in APA Style:
Avcı, G. (2023). An examination of geography perceptions of primary school teacher candidates through draw-write-tell technique. *Bartın University Journal of Faculty of Education, 12*(1), 57-72. https://doi.org/10.14686/buefad.1134079

INTRODUCTION

Geography is a discipline of science that integrates the humankind and natural facts of a globalizing world (Bent, Bakx & Brok, 2014). As a science discipline, Geography originated from a social imperative encompassing a range of needs such as spatial orientation, land demarcation, area design to increase agricultural productivity, and political and military purposes. Nowadays, Geography's contributions to society are needed more than ever (Herman et al., 2020). Although Geography has been regarded as an encyclopedic discipline for long ages, it no longer corresponds to modern-day reality since geography has evolved into one of the most dynamic scientific fields characterizing, structuring, and directing the contemporary world (Arrowsmith et al., 2011). As a discipline, geography plays a critical role in meeting the changing needs of society and addressing real-world matters (Knight & Robinson, 2017). Undoubtedly, the significance of geography in ensuring a secure and healthy future cannot be overlooked (Artvinli & Kaya, 2010). In the broad spectrum of life, geography plays a vital role in enabling people to live sustainably in a world where they are interdependent (Opoku, 2019).

Since the ancient times, geography has accompanied humanity as a 'discipline', providing answers and existential alternatives, and continues to do so. People have perceived geography in various ways over time, and their perspectives have shifted in response to technical breakthroughs, scientific advancements, and the level of information gained on an evolutionary scale. Such perceptional variations have asserted themselves and continue to manifest at the social level among human communities today (Herman et al., 2020). Geography is a science field that begins with where people live and spreads throughout the globe, playing a critical role in their lives in a wide range. As a result, it has been incorporated into the educational programs of every country throughout history. With its shaping and guiding role in the lives of societies, geography holds a critical place and relevance in social sciences, which also interacts pedagogically with societal lives. Problems may be solved before they arise in the societies built by critical, enquiring, active, and participatory individuals who grow up with the versatile perspective of social sciences in general and geography in particular (Karatekin & Sönmez, 2016). Thus, in addition to people's survival, the existence of a viably ideal social life demonstrates the pedagogical value of geography.

Geography is expressed with diverse perceptions and definitions within the framework of several paradigms (Özgen, 2011). "Geography is a science that analyzes the interactions between people, places, and environments, and the link between people and the world." (National Council for Curriculum and Assessment/Department of Education and Skills, 1999: 6). In a specific definition, however, geography is a discipline that aims to clarify the character and formation process of places, the distribution of people in those regions, and the events and developments resulting from this distribution. In this context, Geography pertains to human being-environment relations in the setting of the particular areas and locations (Reinfried & Hertig, 2011). Geography science, which connects human and natural daily realities in a globalizing world (Bent, Bakx & Brok, 2014), plays a critical role in instilling patriotism (love of nation). Loving, administering and defending the place where one lives requires a qualified geographical thought and geography education. Geography education is also a collective responsibility for everyone and every segment of society (Meydan, 2013). Geography education begins with the 1st, 2nd, and 3rd grades in the primary schools, within the purview of life sciences classes. At these levels in geography, students are introduced to subjects and materials that help them comprehend the outer world and the surrounding ambiance in which they live. Geography education is incorporated in the social studies classes of primary schools at the 4th grade and secondary schools 5th, 6th, and 7th grades. These classes cover a broader range of themes and contents, allowing students to comprehend the world in physical, human, and economic dimensions, beginning with where they live (Taşoğlu, 2010). Geography, which examines human being-environment relations, should be taught in schools starting from primary school, according to the structure of geographical philosophy. Thus, students' adoption of their surroundings becomes easier, ensuring that they are to raise awareness about the events happening around them. Accordingly, geography enables people to think independently, solve issues, be versatile and creative, make predictions for the future, and apply the acquired knowledge to real-life situations. In this context, it is critical to overemphasize geography education beginning in primary school. Countless examples prove the significance of geography teaching beginning in primary school. The Tsunami disaster taking place in South Asia in 2005 is one of the most dramatic examples. A 10-year-old primary school student took advantage of the knowledge he had learned in a geography lesson about earthquakes and the formation of tsunamis. His evacuation of tens of people from the shore and saving many lives proved the significance of geography teaching (Meydan, 2013).

The term perception is used commonly and can be used synonymously with the term image worldwide. (Gans et al., 2018). The fact that geography generates conceptually robust bonds with diverse disciplines leads to various perceptions and definitions for the concept of geography. Some interpretations are based on spatial perceptions of the natural environment, while others are on social and temporal perceptions. Geography is an interdisciplinary science covering a wide range of research interests. Such encyclopedic and broad research interest causes diversity and differences in the perception and definition of the geography concept. As a result, geography perception may be defined as individuals' human-space interaction and the state of 'percipience' according to their feelings, opinions, and desires. This perception may vary based on the concepts of "-human, -space, -event, and -state". All perceptions may differ depending on individuals' cognitive and affective states (Özgen, 2011). It is critical to utilize the draw-write-tell technique in revealing such a fluctuating situation. With its emphasis on creativity, the draw-write-tell technique has long been employed in various disciplines, such as health, social care, and educational research (Angell, Alexander & Hunt, 2015). The draw-write-tell technique is based on students drawing on specific concepts, then writing their expressions, and finally articulating their thoughts about them. Drawings may be used to determine students' perceptions of notions (Pınar & Yakışan, 2016). The advantage of this technique is that thanks to its integrative analytical interpretation, it allows researchers to combine three different types of data (drawings, writings, and interviews), minimizing ambiguity and using-valuing all data equally. This technique also enables researchers to see the 'whole picture' and draw conclusions confidently from the data acquired (Angell, Alexander & Hunt, 2015).

Several studies in the literature utilized the draw-write-tell technique to measure perception, opinion, belief, and attitude in many distinct fields (Akman & Ekinci, 2021; Goha, Purwati & Permatasari, 2020; Green & Lliaban, 2020; Lunn Brownlee et al., 2017; Mutlu, & Nacaroglu, 2019; Pope et al., 2018; Üztemur & Dinç, 2018; Üztemur, 2020; Üztemur, Dinç & Ekinci, 2020). When the studies on geography perceptions are examined, it is clear that such studies attempt to expose the perception of geography by adopting various methods/techniques. Morley (2012) aimed to uncover the geography perception of the primary school teacher candidates and discovered that the participants' geography perceptions were both information-driven and theoretically oriented. In their study to assess the geography perceptions of the first-year primary school students through a metaphoric approach, Geçit and Gençer (2011) concluded that, although the geography perceptions of the teacher candidates were generally positive, they were relatively far from the contemporary geographical perspective. Catling (2014) investigated classroom teachers' acquaintance and comprehension of geography and geography teaching. As a result, she observed that geography education was discussed briefly in teachers' training at the international level; thus, the perception and comprehension of the primary school teacher candidates were below the necessary level. In their study on the geography images of classroom teachers with the interview technique, Şeyioğlu and Geçit (2010) concluded that teachers were unaware of the basic principles of geography adequately, that their geography perception was limited to physical geography subjects, and that landforms came to mind when considered the geography, and that their geography images, in general, had omissions and errors. Knight and Robinson (2017) conducted research among first-year undergraduate students in the geography department in South Africa, finding that geography played a vital role in resolving social and environmental issues and had the potential to provide skills, employment, and income. Demirbaş (2013) used the mind map approach to investigate the geography perceptions of social studies teacher candidates and discovered that the geography perceptions of teacher candidates were related to physical geography concepts. Öztürk and Alkış (2009) explored the perceptions of primary school teacher candidates towards geography with open-ended questions. They found that the teacher candidates' conceptions of geography intensely focused on physiography and anthropogeography.

The literature review indicated that Catling's typology (2004) was used in numerous studies to categorize the perception, notion, and opinion about geography and geography education. This categorization consists of five perspectives: Globalist (world characteristics; descriptive geography), Earthist (knowledge and comprehension about how the world works), Interactionist (interdependence and interaction between people and the environment), Localist (how places develop, what they look like, and why), and Environmentalist (sustainability; the impact of human activities on the environs) (Preston, 2015). Despite the recent increment in studies focusing on explaining geography understanding (Puttick, Paramore & Gee, 2018), there were limited studies and significant gaps in the field (Catling, 2014) when the study range on geography and geographical understanding of primary school teacher candidates were considered. Furthermore, no study adopted the draw-write-tell technique and supportive data to explore the perception of geography, despite numerous methods adopted in the literature to disclose the perception of geography.

Primary geography education is a critical aspect of teacher candidates' development. Experiences are essential in the professional development of teacher candidates, especially in disciplines like geography (Dolan et al., 2014). Future primary school teachers, consequently, the current primary school teacher candidates, bear primary responsibilities for effectively implementing geography teaching and raising geographical awareness among their students. The perceptions of teacher candidates towards the notion of geography will both influence their attitudes towards geography subjects in their future occupational lives and perspectives (Demirbaş, 2013). Teacher candidates are critical actors in recontextualizing geography education in the future. Hence, deliberating teacher candidates' perceptions and opinions about geography and geography education is crucial (Knecht, Spurná & Svobodová, 2020). Assessing the geography perceptions of prospective classroom teachers and their reasonings, on the other hand, may constitute insight into future students' potential perceptions and attitudes towards geography. The primary school confronts a vital educational level in forming the first geography perceptions, explaining geography issues, and establishing critical attitudes toward the environment, country, and the living world. To make all mental associations, it is necessary to explicitly reveal the perceptions of the prospective classroom teachers, the educators of the future classes, towards the phenomenon of geography. Therefore, this study aimed to analyze the geography perceptions of primary school teacher candidates created in their minds through drawings. The drawings data gathered were also supplemented by writing activities and interviews to study the geographical perceptions of the participants thoroughly and holistically. Answers to the following questions were sought within the context of the study's objectives:

Research Questions

1. What are the participants' perceptions of geography?
2. What are the fundamental reasons behind the participants' perceptions of geography?

METHOD

Research Design

This study aimed to reveal the geography perceptions of primary school teacher candidates by adopting the basic qualitative research design. While traditional qualitative research methodology is pertinent to constructing meaning, basic qualitative research design focuses on uncovering and interpreting meanings generated by individuals. As a result, the meanings generated by individuals in the context of research questions are discovered and explored in basic qualitative research design (Merriam, 2013). Interviews reveal individual experiences and the meanings ascribed to the phenomena (Creswell, 2013). Interviews also support drawings and written expressions in this context. The current research preferred the basic qualitative research design and focused on uncovering and interpreting the geographical perceptions of the participants. Furthermore, the focus of this study is the geographical perceptions of primary school teacher candidates.

Study Group

The study workgroup consisted of 160 university students selected from all grade levels by using convenience sampling, and they study primary school teaching program at a State University in Türkiye in the fall semester of the 2020-2021 academic year. The reason for choosing the convenience sampling in the current study is that the sample selection is easily accessible, suitable, and convenient for the study to be carried out (McMillan & Schumacher, 2010). In the interviewing stage, the number of participants was 13 (seven boys and six girls), and participation in the interviews was voluntary. The enrolment statuses of the students in the working group were as follows: 39 (21 girls, 18 boys) were in the first grade, 34 (18 girls, 16 boys) were in the second grade, 44 (24 girls, 20 boys) were in the third grade, and 43 (23 girls, 16 boys) were in the fourth grade.

Data Collection

The draw-write-tell technique was used to collect the research data. With the assistance of the integrative analytical interpretation in this method, it is possible to combine three different types of data (drawings, writings, and interviews), avoiding ambiguity and using-valuing all data equally. This function also allows seeing the 'whole picture' and concludes confidently from the data acquired (Angell, Alexander & Hunt, 2015). As a result, the current study, which aimed to reveal the geographical perceptions of primary school teacher candidates, was designed in three stages. Participants were informed about the research goal, process, and participant confidentiality before these stages were set. In the first stage, the participants were given a blank A4 sheet of paper and instructed to draw the first things that came to mind when they thought about the geography, the most associated with geography, and the most evocative objects envisaged before their eyes when they hear the word

geography, without regard to aesthetics, in a class hour. Thus, the first stage aimed to reveal a general geography perception of participants.

In the second stage, participants were asked to detail the connections between their drawings and geography as reasoning why they associated their illustrations with geography. At this stage, participants were asked to write out their justifications on the back side of the paper they had drawn about why that concept came to mind when the geography term was mentioned. As a result, while the first stage aimed to identify the broad geography perceptions of the participants, this stage focused on acquiring a thorough explanation and the reasons underlying participants' geography perceptions. The first and second stages of the data collection process were conducted simultaneously.

The third stage focused on unstructured interviews with 13 volunteers chosen from the working group to support the data acquired in the second stage with a different data collection method. The base of the third stage was the explanation texts written by the participants in the second stage. Thus, the third stage ensured the control of the second stage data and allowed to probe in-depth the geographical perceptions of the participants. The first and second stages lasted for one class hour. However, each interview averaged 20-25 minutes long in the third stage. Participants were given the necessary information for interviews, and their approvals were received before audio-recording the interviews. Furthermore, they were reminded that they could discontinue the interview at their convenience. Ethical principles were the priority in all stages of the study.

Data Analysis

The drawings made in the first stage were subjected to content analysis to reveal a general view of the geography perceptions of the primary school teacher candidates. The inductive approach was utilized to categorize the whole 160 drawings into specific groups. The data obtained in the second and third stages were subjected to content analysis and coded. Participants' statements made were regularly utilized in the coding process. Similarly constructed codes were categorized under the same groups in the next step. At the end of the abstraction process, these groupings were reviewed, and those with comparable characteristics were regrouped to establish the themes (Giorgi, 2009). Each participant was assigned a code name based on their gender and grade level. For instance, the participant with the code 1F3 refers to the third-place female student in the first grade. Student quotations from interviews were incorporated into the study to improve the research credibility. Furthermore, researchers coded on different occasions, then held meetings to discuss the codes and themes afterward to make necessary modifications to increase internal consistency.

Research Ethics

All ethical procedures were completed in this study. Ethical permission of the research was approved by Bartın University Social and Human Sciences Ethics Committee. Ethics committee document number is 2021-SBB-0511.

FINDINGS

The results were structured under two topics in this part of the study: Data obtained from the drawings and acquired from written expressions and interviews.

Drawings

The participants were asked to make a drawing that they identified with geography to disclose a broad view of geography in the first stage of the data gathering process. Table 1 shows the categories determined by the content analysis of the drawings.

Table 1. Geography perceptions of the participants

Category	Drawings and frequency values	%
Political power source (39)	Wars (f:13), Conflicts (f:8), Power Balances (f:7), Geopolitics (f:4), Geographical location (f:4), Colonialism (f:3)	24,3
Geography as a lesson (27)	Trip (f:6), Observation (f:4), Research-Exploration (f:4), Map (f:3), Compass (f:2), Sphere (f:2), Discovery (f:2), Mines (f:1), Stones (f:1), Traveler (f:1), Patterns (f:1)	16,8
Geography as a living space (23)	World (f:6), Universe, (f:4), Environment (f:3), Nature (f:3), Place to live (f:3), Society (f:2), Migration (f:2)	14,3
Climate change and global warming (17)	Extinction (f:4), Disturbance of natural balance (f:3), Seasonal variations (f:3), Glacier melting (f:2), Ozone layer depletion (f:2), Temperature rise (f:2), Greenhouse gas effect (f:1)	10,6

Geography as its vitality (15)	Natural Disasters (f:3), Life of living creatures (f:2), Future of economics (f:2), Weather conditions (f:2), Basic elements (f:2), Information required for life (f:2), Sustainability (f:2)	9,3
Geography as a science (12)	Physical geography: *Climate, vegetation, geographical formations* (f:6), Anthropogeography: *Population, settlement, tourism, industry, trade, agriculture*(f:4), Environmental science (f:2)	7,5
Geography from a global perspective (10)	Globalization (f:3), International organizations (f:3), International markets (f:2), Nations (f:1), Polarization (f:1)	6,2
Geography from an emotional perspective (9)	Destiny (f:3), Patriotism (f:2), History (f:2), Culture(f:2)	5,6
Geographical places (8)	Natural beauties: *fairy chimneys, travertines, waterfalls, canyons, plateaus, beaches* (f:8)	5

As demonstrated in Table 1, the participants' general perceptions of geography were divided into nine main categories. The geography perceptions of approximately a quarter of the participants were political and composed of political aspects, falling under the category of 'Political power source.' However, across all the categorizations, the most common drawing was in the form of an environment depicting war and conflict. Participants drew typical political conflict scenarios without indicating any specific conflict or struggle in these drawings. In supporting this scenario, the constant conflict state of the world and political games that take place in the form of confrontations from time to time were reflected in participants' drawings. In addition, the participant's illustrations exposed that geography is employed as a political tool; in other words, as a source of political power, and that there is a power balance in this regard. Such findings may be regarded that wars, conflicts, political strategies, and political power balances have crucial implications in shifting the world's agenda and directly impacting modern-day political and social structures. It is reasonable to argue, on the one hand, that more emphasis is put on the contents of political geography in geography education, as it encompasses more than wars, struggles, and conflicts. The fact that current international events (war, alliance, armistice), on the other hand, are broadcasted easily through the media seems to be bringing the political aspect of geography to the forefront predominantly. When the drawings in the 'Geography as a lesson' category are analyzed, the participants usually associate geography with travel, observation, and the research-exploration. As an explanation for this, it is safe to say that the travel-observation method, typically used in geography classes, is the determining factor in the research-explorations undertaken in this process. Students observe, examine, analyze, correlate, evaluate, and conclude geographical events on-site with the travel-observation method. As a result, geography perceptions of the participants seem to develop and take form in this manner.

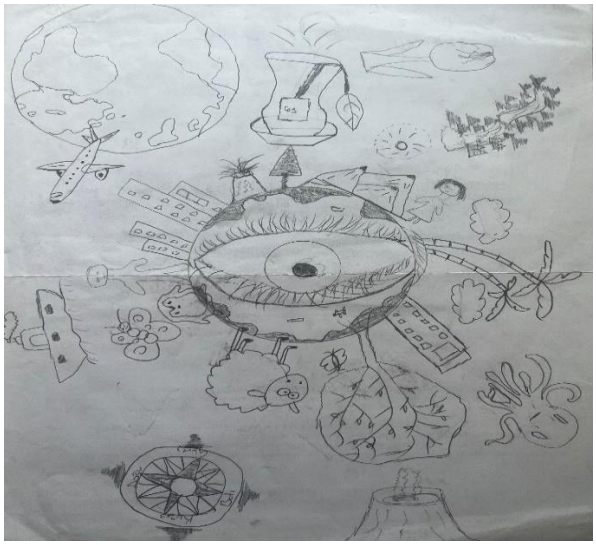
The Earth as the living environment of every living creature, and the Universe, which involves the Earth, were depicted in the participants' drawings expressing their geography perceptions in the 'Geography as a living space' category. In addition, geographical elements, such as the immediate surrounding, nature, and living arrangements, were depicted in the participants' illustrations, defining and reflecting the boundaries of social life. Participants also brought attention to the movement of people between living places, referring to the phenomenon of migration in their drawings. The fact that living space (habitat) is an inseparable aspect of geography may be the most fundamental reason why participants associate their geography perceptions with living space. Yet, everyone needs a place to live. On a large scale, the living space is the globe or the universe for the spatially-oriented participants; however, it is the immediate surrounding or residence for some participants on a small scale. The drawings in this category eventually depicted geographical perceptions of living spaces. When the 'climate change and global warming' category was assessed, some illustrations expressed pessimism, such as the extinction of living life, disturbance of the natural balance, and imbalance and disorder in nature. However, the detailed analysis of the drawings in this category remarked that disturbance and distortion in nature (seasonal variations, glacier melting, ozone layer depletion, and temperature rise) seem to occur unnaturally by the impact of human activities. Participants emphasized the consequences and outcomes arising from the interaction and interference of human and natural processes with each other when assessing from the perspective of the human-nature relationship. These findings suggest that the participants are aware of nature conservation, environmentally conscious, sensitive to the subject, and value life. In this context, it is encouraging that there are people who have the naturalist-environmentalist vision, prioritize issues related to nature and the environment, and emphasize environmental concerns and challenges. The participants' drawings in the 'Geography as its Vitality' category portrayed geography perspectives with the themes of vitality and survival by the principle of vitality. People will survive, sustain, secure their lives economically, and invest in the future when necessary through geographical knowledge/skills that are essential in the modern-day world and are also valuable in our daily lives. In line with

this information, the participants, who adopted a pragmatist approach, brought attention to the geoinformation, concepts, and skills required for their daily lives in their drawings.

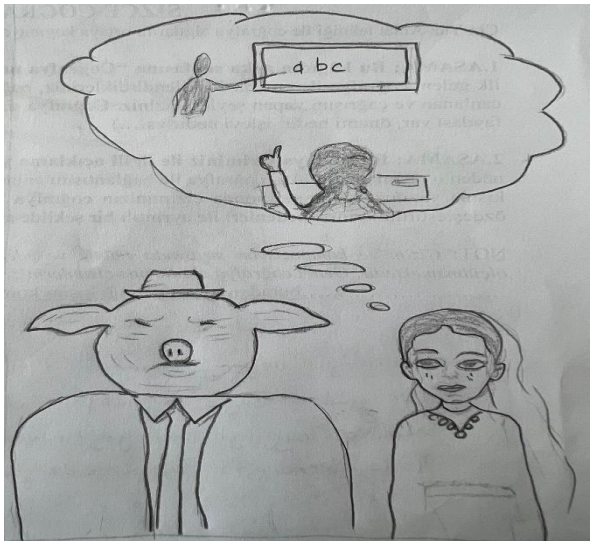
Analysis of the illustrations in the 'Geography as a science' category revealed that participants encompassed the unique and distinct geographical concepts, elements, and aspects. Participants reflected on the global issues and processes under the two topics: Physical geography and anthropogeography. As a result, participants' geography perceptions seemed to organize in this direction since physical geography matters such as climate, vegetation, landforms, and anthropogeography issues, including population and settlement, are emphasized in the geography classes and textbooks. Considering that geography education strives to teach information about human and physical systems, it is possible to argue that the participants' drawings also reflected these facts. However, the participants described geography in their drawings as environmental science and mirrored it as a discipline studying the environment. When assessing the category of 'Geography from a global perspective,' participants' illustrations identified geography from a global perspective with the aspects of globalization on an international scale. Such a standpoint might arise from the fact that globalization is a widespread and contemporary concept. However, the participants aligned their geography with the global economic systems and international organizations, integrated gradually. Analysis of the drawings in the category of 'Geography from an emotional perspective' revealed that participants consubstantiated geography in unscientific terms, for instance, destiny, and notably drew attention to economic injustice. Besides believing that geography is only destiny by ignoring the dynamics of the world, some participants in this category considered geography from a nationalist perspective, such as patriotism and domestication. While expressing their feelings, some participants also added cultural aspects to their illustrations, reflecting the geographical images in their minds. Finally, the drawings in the 'Geographical places' category indicated that they encompassed the most prominent and territorial natural beauties. The existence of this category proved that participants took notice of popular geographical locations while considering the spatial context. The followings are some images representing the particular categories:

Drawing 1. Geography as a living space-Migration

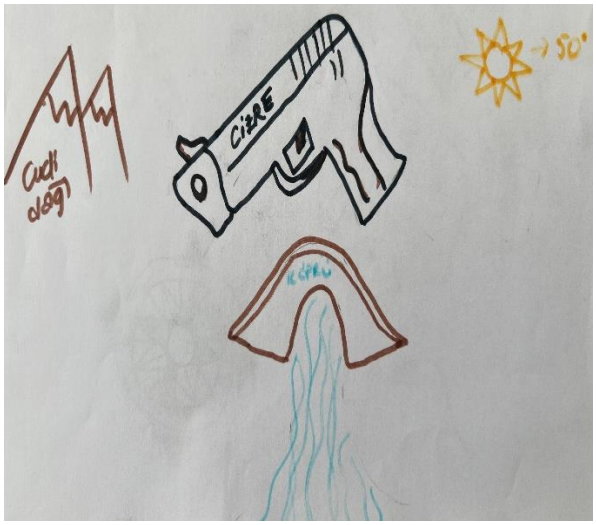
Drawing 2. Geography as its vitality-Natural Disasters



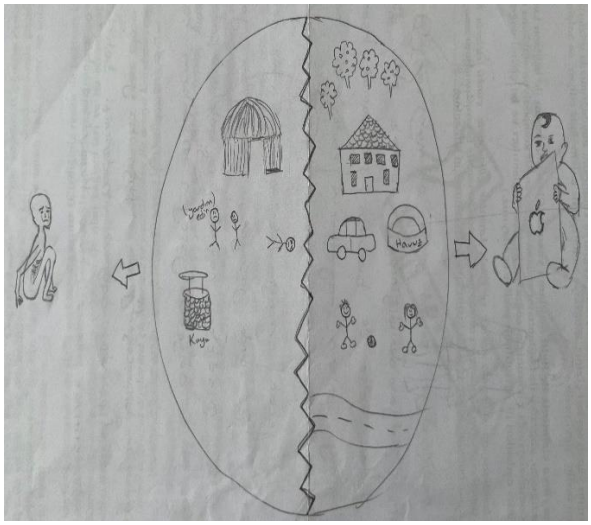
Drawing 3. Geography as a lesson-Observation



Drawing 4. Geography from an emotional perspective-Destiny

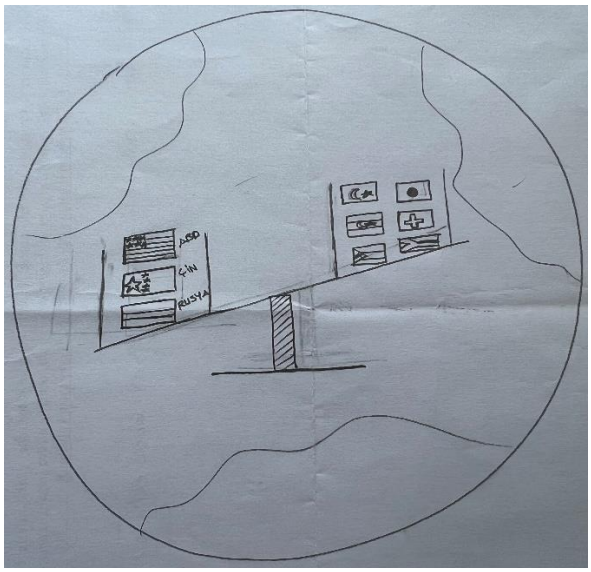


Drawing 5. Geography as a living space-Place to live



Drawing 6. Political power source-Colonialism

Drawing 7. Political power source-Power Balances



Drawing 8. Geography from a global perspective-Polarization

Written Expressions and Interviews

The relationship between participants' drawings and geography was established in this section. As a result, analysis of written statements and interview data revealed the categories listed in Figure 1.

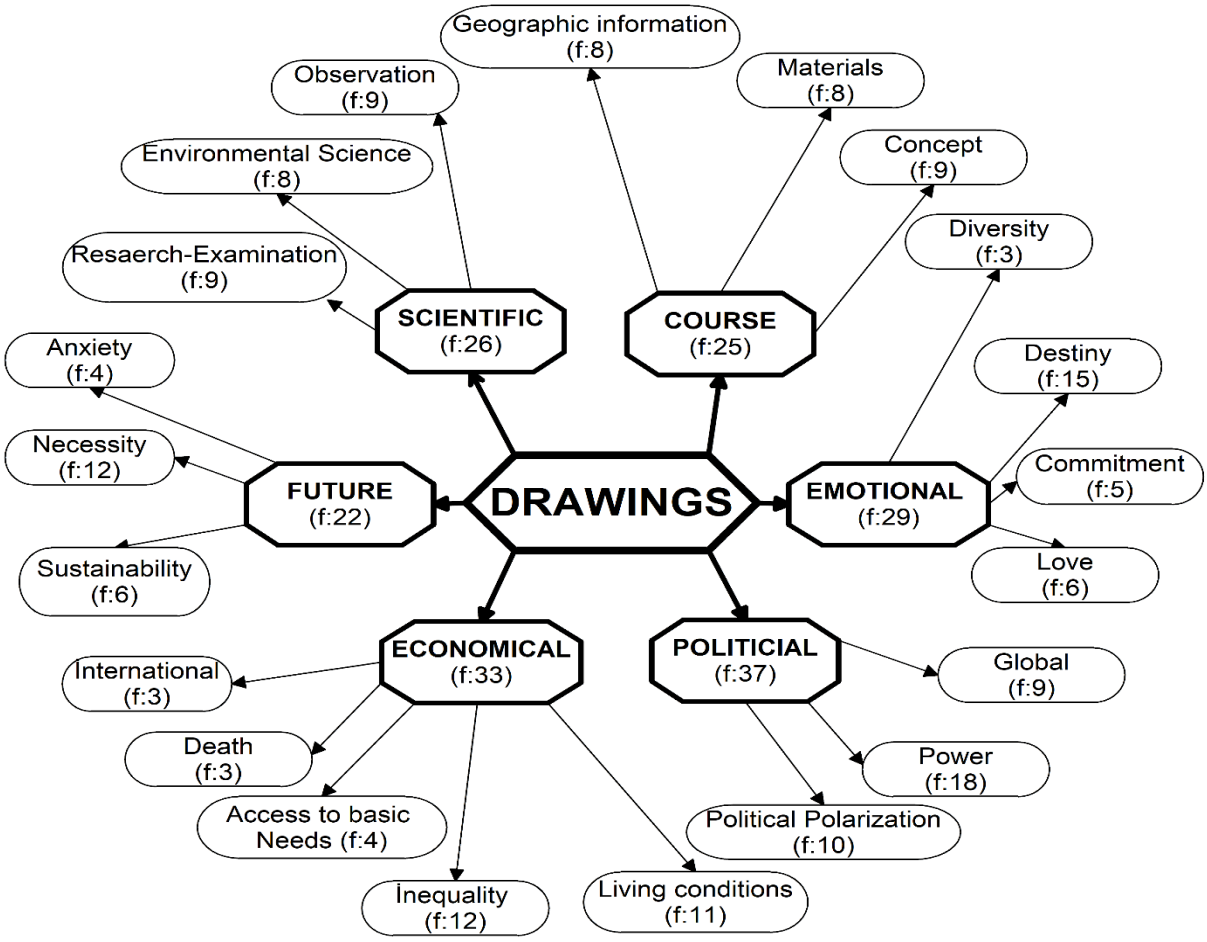


Figure 1. Relationship between Participants' Drawings and Geography

Figure 1 depicts that the logic behind choosing participants to draw such images is classified under six main categories. Furthermore, the drawings listed in the category of 'Economy' are grouped under five different headings, including international, death, access to basic needs, inequity, and living conditions. In the 'Economy' category, Participants stated that geography impacts individuals' economic living conditions and prospects and that financial balance and potential also shape the geography worldwide. Furthermore, participants commonly expressed the following issues: The economy determines the quality of human life, there are inequities and injustices at the international level, the global geography is under the influence of developed countries economically, and the least-developed countries have limited geographical opportunities. The opinions of participants with the codes 4M7 and 3F15 are given below as examples in this category:

"When I say geography, I think of global injustices. Because I believe that geography is like, some people live in wealth and prospect while others seek a slice of bread to survive. For example, in such a world, while people in America are obese from overeating, others in Africa are starving to death like skin and bone. There is more. It is a state where some girls have education, but others do not, and while some kids enjoy playing in the park, others sell handkerchiefs." (4M7).

"When I think of geography, the first thing that comes to my mind is economic inequity. I tried to convey this fact in my drawing. While people live in prosperity on one side of the world, children are starving on the other side. Again, while some people can buy a car by working for a short time in one region of the world, people like us struggle to buy even an old car after working for years, and thus these kinds of economic disparities come to my mind when geography is discussed. For example, while children in Africa die of starvation and diseases or die in inadequacy, I feel too sad that wealthy countries exploit them, violate their rights, and cause the deaths of

children. In conclusion, we have become a generation that should be concerned much about the economy since we now have to think three times before purchasing a coat or a pair of shoes due to our country's economic turmoil. Therefore, the first thing that comes to my mind when I think of geography is such inequities." (3F15).

The followings were emphasized in the quotations above; geography explicitly determines human living conditions, there are inequities worldwide, and even deaths may occur by the effects and causes of geography. Assessment of the category of 'political' concluded that the subject-related drawings mainly focused on power balances, political interests and interactions, polarization between countries, and war and conflict on a global scale. Participants in this category also linked geography to political events and their consequences. They also highlighted that political events, country-based political interactions, global challenges, and future policy scenarios are well intertwined with, albeit unseparated from geography subject. The opinions of the participant coded with 2M24 on this subject are as follows:

"There are wars in the world for centuries. War is not only fought with artilleries and rifles. In today's world, your one statement would be enough if you had an important role in the politics of a country... The history books do not write who rules the world or which countries have twisted the world in their fingers. Everyone makes their hero. It is like certain presidents we always see on the news are plotting to take over the world. There is always news like occupy there, blow up this place, kill someone… it never ends. People may be grateful for their current status when they imagine times in the Nazi administration, Saddam Hussein, or Stalin. But there is something we should not forget: History repeats itself. People differ, but tyranny does not. We are like a pawn on the chessboard. The squid game is a good example in this respect. It is a world where rich people monetize us, but they do not care about us. A world in which a worker, who has difficulty keeping his/her house with every increase in the dollar exchange rate, commits suicide. A world where people are killed in the middle of the street because they are black. It is an environment people are brutally raped and killed because of their religion and underground resources in their homeland. Yet, leaders are ruling us like playing ostrich. The industry giants also share this cruelty, which I did not include in my drawing. It is like a sector employing workers for a dollar a day for jean production in a factory on the brink of demolishing in India and does not even care about animals." (2M24).

It is possible to interpret from the quotation above that the same political scenarios recur across geographies and that the ambitions of the global political actors always overbuild on their interests and conflicts. Furthermore, the desire for geographical expansionism by politically powerful individuals or countries has existed throughout history and continues to exist nowadays. In other words, geography has been consubstantiated with especially political relations and their consequences. The 'Future' category included the concern, demand, and sustainability headings. Participants in the 'Future' category remarked that they were concerned not just for themselves but also for future generations regarding critical issues for human life such as food, water, shelter, health, safety, etc. It is encouraging that the participants, who reflect their perceptions of geography from a pessimistic point of view, consider future generations. However, the participants brought attention to the current status of the glove, stating specifically the realities of the world ravaged by humans. The followings are the views of the 4M8 and 4F11 coded participants who identify geography as a demand and requirement for our future:

"Geography is everything in this universe. If nothing existed in this universe, geography word would also not exist. It is like recognizing a tree from its fruits; if a tree did not have any fruit, no one would recognize what kind of tree it was. It would be a tree of nothing. Indeed, this universe is not empty; there are planets, trees, human beings, soil, water, and air, and they are all the fruit of the tree called geography. These fruits introduce geography to us. Our responsibility is to protect those fruits here. Because if those fruits are extinct, everything becomes futile. We must not harm ourselves, and above all, we must protect the geography in which we live. We must protect it. Because it is the tree called geography that sustains everything. Shortly, geography is life. Let me put it this way: geography is everything necessary for the continuation of the human generation." (4M8).

"I think geography is kind of a must. People lean on different thoughts to live in this geography. They make sacrifices to keep along with the geography. For these reasons, I liken geography to water, which is the most critical element for human life, that is, something giving life to human beings. The water is necessary for us to wash our hands and face in the morning, the air I breathe when I go out, the stars at night, the sky, etc. are all necessary, and they all mean geography. I attempted to demonstrate this manner in the picture I drew. I drew a bagel seller and a bagel buffet. For this bagel seller to keep up with this geography and survive, he must sell those bagels and hold on to life. Or, we can approach the issue from this perspective: Let us assume that the bagel maker has a newborn child. The fact that the newborn child needs the income from that bagel buffet to keep up with this geography to hold on to life shows that geography is a must." (4F11).

According to their quotations above, the participants stated that geography shapes the past, present, and future. They also emphasized the significance of learning from geographical occurrences and their consequences to build a better future. They called attention to the fact that geography impacts the future by its structure. Participants in the 'Emotional' category reflected geography as destiny, compassion, acceptance, and divergence. Participants primarily associated geography and destiny together, and their reflections were highly emotional, albeit far from being scientific. Some participants, however, emphasized the love of country and nation along with national sentiments. They also mentioned cultural differences while expressing their feelings. Quotations on the subjects of destiny and compassion, which are also included in this category, are given below:

"Geography is our destiny, and my destiny is the Cizre region with its Mount Cudi on one side, botte around it, birds hill, its historical beauties, and the river flowing with the love of Mem û Zîn. Geography is our destiny: It is a cliché, but it shapes our childhood, our future, and our whole life. What we choose and have to choose also defines our destiny. Cizre is a region where the violence took place during a period that shaped my destiny, and people broke down psychologically. It is a place where most people cannot see their beauty due to their prejudices; they are afraid and do not dare to take a step. It is my geography, my homeland, making me mature with its air and treeless terrain." (4M27).

"… It is possible to come across the ruins and traces of thousands of years of history in every corner of our country. Mesopotamia, which we call the cradle of civilization, is located in our country. Citizens of our country have also tried to protect this heritage from past to present. They did not let it be abused and preserved unity and solidarity. They respected all kinds of religious and political beliefs. Foreign forces tried to provoke disturbance when they realized that they could only divide us with such attempts. Sometimes they were successful, but sometimes the Turkish nation stood against and protected our country." (3M28).

It may be inferred from the statements above that geography from an emotional standpoint, which is dominated by a subjective point of view, may occasionally represent something to be proud of; but something to be sorry for sometimes. The participants associated their personal experiences with geography. Participants in the 'Scientific' category defined geography as a discipline that studies and explores the environment, emphasizing the scientific methods and techniques employed in geography. The opinions of the participants with the codes 4F31 and 2F22 are given below as examples in this category:

"To me, geography is the main source of many science branches that people primarily get to know themselves and improve their living standards. A person cannot achieve the desired success in any science field without understanding the planet he lives in and examining the air, soil, underground, and earth very well. For example, human beings may not know where and how to farm without learning the landforms, mountains, plains, and streams well; thus, they may fail to produce enough food, namely the basic source of life. They may also fail to do agriculture without analyzing the soil structure, plant species on the earth, and weather conditions. Or, they may not succeed in mining without knowing the element structures. Without knowing the air currents and the sunshine duration, people cannot suffice from wind and solar energy. When considering all these facts, it is critical to comprehend and explore our world very well with its earth forms, underground resources, soil, and air to develop almost all science branches and possess them to the service of people. Therefore, I believe geography is the most basic science." (4F31).

"In my opinion, geography is whatever we perceive when we sense it from a single center. That single center, as reflected in my drawing, is the eyes. When we open our eyes, we begin to communicate with the earth. In my opinion, geography is a discipline in which we communicate with all kinds of eyes in the world, encompassing from living to non-living…" (2F22).

It is possible to make inferences from the quotations that geography is a discipline that study the environment through observing, researching, and using them for the sake of humanity. Geography and geographical knowledge play a critical role in the sustainability and continuity of human life. Participants underlined that societies unable to comprehend the world in which they live, ignore their surroundings, and are unable to defend and care for the environment they live in fail to achieve their objectives. However, participants remarked that any activity without observing, examining, and researching the habitat would have detrimental consequences for humans. Geography discipline is educated as a course in schools. In the 'Course' category, participants identified geography with the knowledge, concepts, and materials they acquired, used, and practiced in the courses. Since the participants in this category had previously-attained extensive geography education, they frequently referred to geography materials (globe, map, compass, etc.), concepts (latitude, longitude, landforms, etc.), and significant geographical teachings

while explaining their drawings. The followings are the opinions of the 4F3 and 4F24 coded participants to serve as examples of their viewpoints in this category:

"...Landforms, maps, compass, regions, and countries come to my mind when geography is discussed. People also use maps, compasses, and similar devices to discover new places. Thanks to these discoveries, new inventions and works are being created. The fact that geography inspires innovations and demonstrates that geography exists in all aspects of life. As a result, the world and things taking place in the world; and works and innovations produced by these activities come to my mind when geography is discussed." (4F3).

"When I think of geography, I think of the geography classes like every student. In geography classes, we learn the shape of the globe, the formation of continents, in which climates animals live, etc. That is why the world naturally came to my mind, and that is why I drew a world map in my drawing. I also drew the mountain ranges in the world, which is an indispensable part of the geography course. I drew some animals on the map according to the continents they live in, like adding a penguin to the south pole and a polar bear to the north pole. Finally, I drew a tree to show the Amazon forests, known as the lungs of our world." (4F24).

As deduced from the quotations, the knowledge and concepts learned and the materials used in the geography courses had a long-term impact on the participants and significantly impacted their geography perceptions. Acquiring information for such a critical science branch permanently in the course is vital for geography education.

DISCUSSION & CONCLUSION

Geography is a broad discipline with significant implications across various professions. (Özgen, 2011). It is pointless to discuss a simple and singular geography perspective since it encompasses several academic topics, even bridging natural and social sciences. (Alkış 2009). The fact that geography has potent conceptual linkages with numerous disciplines results in the generation of various perspectives and definitions of geography. (Özgen, 2011). Consequently, disclosing the geography perception by a sole approach is unachievable. This study tested the geography perceptions among primary school teacher candidates in three stages. In the first stage, participants were asked to draw images associated with geography in their minds to determine their general perception. This approach allowed researchers to acquire more-detailed and deeper information by employing visual image elements where words were insufficient. (Üztemur, 2020). The first stage revealed categorizing the general geography perceptions of primary school teacher candidates under nine groups. A quarter of the participants perceived geography as a source of political power; in other words, a tool for politics. The geographical concept was primarily associated with wars, battles, and political unrest in the images. In a study conducted with high school students, Opoku (2019) discovered that geography was related to numerous academic fields, especially politics and political issues. In their study conducted with teacher candidates, Durmuş and Baş (2016) also determined that the participants linked geography with war metaphors. One of the teacher candidates in the study also associated geography with war metaphors, articulating his rationale for his views with the following words: *'Geography is for fighting. All living creatures on earth and countries should wage war to survive and live up to prosperously.'* Akman and Ekinci (2021) reported that the war phenomenon was portrayed frequently in the history category; the main reason for this was that participants were influenced by the events that occurred in their immediate surroundings in their recent past. In the current study, however, the depiction of wars, conflicts, and struggles for political power in the drawings might imply that the participants were influenced by contemporary battles (Russia-Ukraine war, political events in Syria, Afghanistan, etc.). As a result, inferring that past and recent events participants experienced may have invoked war themes. The geography perceptions of the Participants were also mirrored in the drawings by the geography lesson and science area, living space, and geographical spaces. Opoku (2019) determined that geography is an academic scientific discipline, according to the teacher candidate responses. However, several classroom teacher candidates reflected geography as a living space for geography within the category of 'geography as living space and place,' according to Geçit and Gençer (2011). Some participants described geography on a broad scale from a global perspective, while others described it as a subjective view on a small scale. Özgen (2011) reported that teacher candidates indicated their geography perspectives as taking global and national dimensions into account. Catling (2004) and Morley (2012) concluded that the international perspectives of geography perception were prevalently dominant in the drawings. The participants identified geography with 'destiny' from an emotional standpoint. Contrary to the contemporary geographical methodology and rational point of view, matching and linking geography with destiny is excogitative. However, illustrations also contained critical issues for life in the form of modern-day risks such as climate change and global warming. Sahin (2015) reported that most social studies teacher candidates associated geography with the category of 'life source.' Akman and Ekinci (2021) remarked that teacher candidates'

illustrations seek to call attention to raise awareness about events such as global warming and natural disasters that have a critical impact on modern-day human life. Catling (2014) pointed out that climate change was a geographically crucially key element in comprehending the global natural environment, especially for primary school students. Furthermore, she stated that global warming, which covers issues such as the ozone layer and the greenhouse effect, is also an equally critical issue. One of the most noticeable aspects of the participants' drawings was the emphasis that people pollute and damage nature and the environment, resulting in harmful changes in the world. Similarly, Özcan and Demirel (2019) stated that environmental issues such as global warming, the greenhouse effect, acid rain, and loss of natural resources were generally human-induced in the drawings. For a sustainable future, protection, and livability of our world, Kola-Olusanya (2017) indicated that people need to acquire knowledge and awareness of contemporary environmental and sustainability issues.

In the second stage of the study, the participants detailed their clarifications about the linking between drawings and geography. They also expressed their motivations for how they identified this drawing with geography. Similarly, the third step of the research focused on acquiring the participants' perspectives about geography through interviews. Thus, the reasons underlying their perspectives, whose broad geography perspectives had been exposed in the first stage, were attempted to be disclosed in the second and third stages. The analysis results of the written statements and interviews proved that the explanations of the primary school teacher candidates on geography were classified into six distinct categories. Analysis of the results of the second and third stages revealed that the structure of the participants' geography perceptions was consistent with the first stage. Because their expressions to clarify the drawings emphasized the written remarks and interviews. In the written statements and interviews, participants endeavored to depict geography by focusing on political and economic issues and phenomena. According to Knight and Robinson (2017), financial and political matters play a significant role in undergraduate geography students' opinions of fields of geography that are relevant to the modern-day world. The purpose of geography is to prepare individuals to become citizens by making them aware of current political, environmental, social, and economic issues. Hence, it is an ordinary inference for teacher candidates to describe the facts they frequently encounter in their journey to becoming a citizen and the events that are closely related. Similarly, Fatima (2016) reported that geography would be a decisive factor in a country's future development and planning. Consequently, participants in this study regarded geography as power balances, international markets, and mutual interest on a global scale, whereas they defined and explained geography as livelihood, injustice, and inequity on a local scale. Çiftçi and Dikmenli (2019) posed teacher candidates the question of why geography is necessary, and one-third of the participants responded; 'geography is necessary to govern the country and defend the homeland.' In his research on primary school students' geography perceptions, Senyurt (2014) also found that some students' statements about geography focused on issues such as 'domestic and foreign policy/geopolitical relations and placement among countries.' The participants in this study, on the other hand, characterized geography as the love of a country nourished by national feelings, and they also included geography in their narratives as an undesirable situation (destiny). The majority of the teacher candidates who participated in the study of Çiftçi and Dikmenli (2019) stated that geography teaching is crucial for fostering patriotism and raising awareness about homeland security. According to teacher candidates, nourishing patriotism and raising awareness for homeland security can only be instilled via understanding their homeland. Furthermore, teacher candidates underlined the significance of geography in correctly assessing the events taking place in their surroundings and around the world. They further reported that geography knowledge improved their interpretations of activities and that their attitude toward nature and all other living creatures changed. For some participants, geography was a historical lesson taken from the past, while for others, it was a prominent science to shape the future of living things. Geography is also required to understand better and appropriately utilize the immediate surroundings. Nowadays, we must efficiently use geography to maintain our existence on the planet, keep up with the rapidly changing globe, and plan for the future. Geography as science evolved from several social necessities, including space orientation, field planning, area organization to maximize agricultural productivity, political and military objectives, etc. Therefore, such needs make geography a crucial science branch that leads to discovering, understanding, solving, and preventing countless fundamental matters globally.

Drawings and verbal and written expressions made about those drawings disclosed the geography perceptions of the primary school teacher candidates. Some participants identified geography with a simple map, while others associated it with fairy chimneys or migration phenomena. Sometimes geography was a starving boy, and other times it was a girl enforced into marriage. For some participants, geography indicated cultural differences, while for others, it reflected a standardized human profile in a more globalized world. For some participants, geography was a love of country and nation that was unreplaceable with anything; for others, however, it was to depart from

their homeland unwillingly. One of the most critical findings of the study was that events taking place both in the world and in Türkiye signified the geographical perceptions of the participants. While the equivalent of geography is in the forms of physical geography, human geography, and physical-human aspects mirroring these two in the majority of the studies in the literature (Akman & Ekinci, 2021; Catling, 2004; Demirbaş, 2013; Dolan et al., 2014; Gökçe & Öztürk, 2013; Opoku, 2019; Öztürk & Alkış, 2009; Senyurt, 2014; Şeyihoğlu & Geçit, 2010), political and economic issues were dominating aspects in the current study. The perspectives of individuals around the globe, including Türkiye, have been molded by political and economic developments; nevertheless, this perspective may shift in response to current events. In other words, it is safe to say that the experiences and witnessed events have significantly altered and will continue to alter the perspectives and focal points of the participants. As a result, the current study discovered that the dynamic structure of the world arena shapes the geography perceptions of the participants in the context of contemporary political and economic factors, that geography is a critical power source locally and globally, and most importantly, that geography is a significative and decisive element for the future life.

This study utilized various data to unveil the geographical perceptions of students that pursue education in primary school teaching. Conducting further studies among diverse age groups and in several fields may ease uncovering participants' perceptions, attitudes, and opinions on the topics of interest. Pictures drawn can be used to capture reliable data, especially in young age groups when data collection is challenging, and such data can be supported by writing and narrating approaches. However, the draw-write-tell technique is recommended for collecting data on current and critical issues. The data gathered should be exposed to participants' discussion, evaluation, and opinion expression, and participants should be directed to new studies by guiding the process.

Statements of Publication Ethics

Ethical permission of the research was approved by Bartın University Social and Human Sciences Ethics Committee. Ethics committee document number is 2021-SBB-0511.

Researchers' Contribution Rate

The study was conducted and reported by the corresponding author.

Conflict of Interest

The author of this article declares that there is no conflict of interest in this study.

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BARÜ Bartın University Journal of Faculty of Education BUEFAD

2023, Volume 12, Issue 1, 73-84
dergipark.org.tr/buefad
DOI: 10.14686/buefad.993603

Determining the Effect of University Students' Technology Usage Levels on Digital Reading Self-Efficacy

Research Article
Received: 10.09.2021
Revised: 12.11.2021
Accepted: 16.11.2021

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ABSTRACT

This study aimed to determine the effect of technology use of university students studying in the field of health on their digital reading self-efficacy according to different variables, in this study. The survey model was determined to be suitable for the research and the data were obtained by convenience sampling method. The sample group consists of 461 (372 female-89 male) students studying at Sivas Cumhuriyet University. The research data were obtained by applying the "Reliability of the Technology Usage Scale" and the "Digital Reading Self-Efficacy Scale". Descriptive statistics, independent groups t-test, ANOVA, Tukey, CFA, and SEM techniques were used in the analysis of the data obtained. It was determined that students' technology use levels differed significantly in terms of internet usage time, digital reading self-efficacy in terms of grade level, and branch according to the research findings. In addition, it was determined that students' technology use levels had a positive effect on their digital reading self-efficacy levels and predicted all their factors.

Keywords: Digital reading, self-efficacy, SEM, technology use, university students

Üniversite Öğrencilerinin Teknoloji Kullanım Düzeylerinin Dijital Okuma Öz-Yeterlikleri Üzerindeki Etkisinin Belirlenmesi

ÖZ

Bu araştırmada sağlık alanında öğrenim gören üniversite öğrencilerinin teknolojiyi kullanma düzeylerinin dijital okuma öz-yeterlikleri üzerindeki etki düzeyinin belirlenmesi, farklı değişkenlere göre incelenmesi amaçlanmıştır. Araştırmanın modeli olarak tarama modeli benimsenmiş olup veriler kolayda örnekleme yöntemiyle elde edilmiştir. Örneklem grubu Sivas Cumhuriyet Üniversitesinde sağlık alanında öğrenim gören 461 (372 kadın-89 erkek) öğrenciden oluşmaktadır. Araştırma verileri Zincirkıran ve Tiftik (2014) tarafından geliştirilen "Teknoloji Kullanım Ölçeği" ve Akkaya ve Çıvğın (2020) tarafından geliştirilen "Dijital Okuma Öz Yeterlilik Ölçeği" uygulanarak elde edilmiştir. Elde edilen verilerin analizinde tanımlayıcı istatistikler, bağımsız gruplar t testi, ANOVA, Tukey, DFA ve YEM teknikleri kullanılmıştır. Araştırma bulgularına göre; öğrencilerin teknoloji kullanım düzeylerinin internet kullanım süresi, dijital okuma öz-yeterliklerinin sınıf düzeyi, branş ve internet kullanım süresi değişkenleri açısından anlamlı farklılık gösterdiği belirlenmiştir. Ayrıca öğrencilerin teknoloji kullanım düzeylerinin dijital okuma öz-yeterlik düzeyleri üzerinde pozitif yönde etkisi olduğu ve tüm faktörlerini yordadığı saptanmıştır.

Anahtar kelimeler: Dijital okuma, öz-yeterlilik, YEM, teknoloji kullanımı, üniversite öğrencileri

To cite this article in APA Style:

Arslan, A. (2023). Determining the effect of university students' technology usage levels on digital reading self-efficacy. *Bartın University Journal of Faculty of Education*, *12*(1), 73-84. https://doi.org/10.14686/buefad.993603

INTRODUCTION

Technology is increasing its influence in all aspects of life from health to education, traffic to shopping all over the world and making people's lives easier. The technology that individuals use in their education, professional and daily lives has an indispensable importance. There are overlapping aspects of the technology used in different areas, as well as differentiating aspects. All over the world, technological tools in numerous categories that are developing and developed at an incredible speed are being released. While technological tools such as computer, phone, tablet, gender, age, etc. appeal to everyone, the tools used in areas such as health, automotive, education appeal to a more limited segment. Technological devices developed specifically for all segments of society or for more specific areas are constantly updated in terms of their physical structures as well as their features. In this direction the internet, computer, mobile phone, tablet, mobile memory, CD, camera, etc. are used in the field of education, constantly evolving, both physically and in software (Öksüz & Karakoç, 2010). In this way, education does not lag behind technological development and becomes suitable for the era. The advantages of technology in educational environments offer great benefits by facilitating the learning process. Using technology in education, multiple learning environments are created, students' different learning needs are prioritized, and interesting methods are brought to the education environment in order to maximize students' interest in the lesson (Yalın, 2003). At the same time, since the use of technology reduces the loss of time spent in the education process, the time allocated for achieving the learning goal and making learning permanent is more (Katrancı & Uygun, 2013).

The materials that have a significant impact on learning should be used in learning environments by adapting them to the technology of the era and they should be constantly updated within the framework of emerging needs (Bozpolat & Arslan, 2018; Ellis, 1997). While the importance of all kinds of technological tools used in learning environments is emphasized, one of the important issues is the necessity of educators who need to use these tools to have the necessary competence (Dargut & Çelik, 2014). In this direction, educators at all levels of education should have the necessary level of competence (Allwright, 1981). Of course, a quality learning environment cannot be created just as a result of educators having technological competence.It is important that students as well as educators, develop their skills to use technology (Koehler & Mıshra, 2005).

Today, it is seen that technology is used in almost every lesson in educational environments. Technology, which is used in different courses for different purposes and techniques, not only contributes to students' lessons but also positively affects their success. The student whose course success increases also develops a positive perception of their learning becomes more active in lessons and develops self-confidence about learning. One of the contributions of technology to educational environments, perhaps the most important one, is that access to information occurs in almost seconds. The knowledge and skills related to many topics in different lessons are acquired not only from books, as in traditional teaching but also from platforms with different software and features based on the internet; but it is also important that the skills related to the use of this information are improved. The students who acquire information by reading from written different sources formerly (books, magazines, newspapers, brochures, etc.), should have digital reading skills by transferring this information to digital media. Otherwise, they have a limited chance to use this information. As with traditional learning, reading is more important in digital learning than other skills. Because reading skill is the basis of the student's learning and understanding of many lessons. In this context, students have to effectively read digital resources as well as printed materials (Güneş, 2016). As Luma (2002) says; it should not be forgotten that the reading skill has a decisive effect on the success of the individual in their academic life since reading is not limited to just reading the information straight, it includes the processes of discovering information, understanding, making connections, restructuring the mind by analyzing and evaluating (Güneş, 2016). For a person to adapt quickly to the developing and changing world, it is necessary to constantly improve the reading skill that she/he has throughout her education life since the moment he/she stepped into the school (Akkaya & Çıvgın, 2020). Of course, this development directly affects the development of the society in which the individual lives, as well as affects his/her own life. After all, all societies are made up of individuals (Bloom, 1979; İşeri, 1998).

Most of the information was obtained by reading from printed sources in the past. However, with the entrance of technology into our lives, information is now received through digital reading using a variety of technologies such as computers, smartphones, tablets, e-book readers, electronic signs, and visual screens. These tools not only make it easier for individuals to access, read and understand information, but they also allow rapid exchange of information via various social media platforms such as WhatsApp, Facebook, Instagram, and sharing e-mails. Digital reading, also known as screen reading or e-reading, is defined as loading new meanings into the information reflected on the displays of various tools and absorbing this knowledge through mental processes (Akkaya &

Çıvgın, 2020). People read by accessing the information they want with an internet connection without any restrictive factors such as place and time. This new type of reading, which is the result of the times we live in, includes different features that everyone, especially students, has not experienced before in their lives (Odabaş, Odabaş, & Sevmez, 2018). The benefit and functionality of digital reading are high, as it provides instant access to the needed information. Knowledge, language, and mental talents combine to generate a new kind of communication (Wolf & Barzillai, 2009). A personalized and interactive information flow is offered by digital tools. Moving texts and visual components add vitality to reading, making it more enjoyable. Thus, students of all ages can read without getting bored (Akkaya & Çıvgın, 2020). Although it appears simple to read digitally on a regular and continuous basis; it is required to have various technical and protective information such as the advertisements, harmful elements, text tracking functionality, and other distractions from the text (Odabaş, 2019). Furthermore, it is critical to learn how to use the screen, pay attention to screen indications, remember the information presented on the screen, and highlight important locations if necessary. In this way, skills such as high-level thinking skills, attention, comparison are also developed. Research reveals that young people use digital reading more efficiently and widely than older people. However, especially during the Coronavirus pandemic we are in, digital reading has also developed in older people, as many jobs need the use of technology (Akkaya & Çıvgın, 2020).

In order to use technology, which assists people in almost every profession, more effectively during the pandemic period, it is necessary to make accurate digital readings of information in many fields. In this sense, people's self-efficacy in digital reading is also important. In general terms, self-efficacy is accepted as a belief or judgment of a persons' abilities in a particular subject (Bandura, 1994; Pajares, 2002). In digital readings, it was thought that a person's strong self-efficacy perception may make the person more successful.

Currently, technology that causes changes in perception thought, and behavior in all areas has become a very important topic in the field of education, especially during the coronavirus pandemic. The pre-existing concept of "distance education" has become an indispensable part of the education of all students, not just a certain part of students, during this period. Although there are many studies on the reflections of distance education during the pandemic period, no study has been found on university students studying in the field of health. During the Covid 19 period, students' competence in using technology is very important for the quality of education. It is accepted that students' effective use of technology will positively affect their education. This issue is especially important in the field of health, which is one of the fields that should receive face-to-face training. As a result of the presupposition of the interaction between university students' level of technology use and their level of digital reading self-efficacy, it was decided to conduct this study. This study aims to determine the effect of technology use levels (TUL) on digital reading self-efficacy (DRSE) of students studying in the field of health. In addition to this purpose; it was also aimed to determine whether TUL and DRSE differ in terms of students' gender, grade level, branch, daily internet usage time. In this regard; it has been accepted that it is important to determine the effect of students' TUL on their DRSE, and this research on this subject will contribute to the literature. The research problems and hypotheses determined in line with the purpose of the research are as follows:

P_1: Is there a significant difference in TUL and DRSE of students receiving health education based on gender, grade level, branch, and daily internet usage time? The hypotheses developed in the context of this problem are as follows:

H_1: TUL and DRSE are affected by student gender.

H_2: TUL and DRSE are affected by student grade levels.

H_3: TUL and DRSE are affected by the student field of study.

H_4: TUL and DRSE are affected by students' daily internet usage time.

P_2: Is there an effect of the TUL of the students on DRSE? The hypotheses developed in the context of this Problem are as follows:

H_5: The students' TUL affects their DRSE.

METHOD

In this section of the research, information about the sample group, data collection tools, data collection, and analysis processes are presented.

Study Group

The data were obtained with the general scanning model, and the convenience sampling method was applied. In the general scanning model, each unit in the universe has a probability of being selected for research. In addition, each selected unit has a decisive effect on the probability of the other being selected. In short, there is a possibility of independent participation completely (Özen & Gül, 2007). It is possible to calculate the error rates

and accuracy levels of the data obtained from the participants (Kish, 1965). Based on d= ±0.03 sampling error at 0.05 significance level (Yazıcıoğlu & Erdoğan, 2014), 461 (372 female, 89 male) students were taken as a sample from 3356 students studying in different programs at Sivas Cumhuriyet University Vocational School of Health Services. Demographic information about the sampling is presented in Table 1.

Table 1. Demographic Information of the Sampling

Variables		(f)	(%)	Variables		(f)	(%)
Gender	1.Female	372	80.7	Daily internet usage time	1.1-2 hours	268	58.1
	2. Male	89	19.3		2.3-4 hours	161	34.9
Class level	1.1nd grade	173	37.5		3.5-6 hours	23	5.0
	2.2nd grade	288	62.5		4. 7 hours or more	9	2.0
Branch	1. Child development	94	20.4	Internet access reason	1. Lesson follow-up	116	25.2
	2. Audiometry	59	12.8		2. Communication	97	21.0
	3. Emergency and first aid	52	11.3		3. Social media	141	30.6
	4. Medical imaging	78	16.9		4. Get information	46	10.0
	5. Dialysis	36	7.8		5. Watching a movie	14	3.0
	6. Operating Room Services	48	10.4		6. Listening to music	13	2.8
	7. Physiotherapy	32	6.9		7. Others	34	7.4
	8. Laboratory techniques	30	6.5	Used tools	1. Phone	445	96.5
	9. Dental prosthesis	32	6.9		2. Computer	16	3.5

Data Collection

The research data were obtained by applying the "*Reliability of the Technology Usage Scale*" developed by Zincirkıran and Tiftik (2014), and applying the *"Digital Reading Self-Efficacy Scale"* developed by Akkaya and Çıvgın (2020).

Reliability of the Technology Usage Scale (RTUS): The scale developed by Zincirkıran and Tiftik (2014) consists of 12 items. It was prepared in a five-point Likert style with the answers "*Absolutely agree=5 ...Absolutely disagree=1*". The reliability of the scale was checked and the Cronbach Alpha value was found to be .84, and it was found to be .81 in this research as well. The scale scores a maximum of 60 and a minimum of 12 points to participants.

Digital Reading Self-Efficacy Scale (DRSES): The scale developed by Akkaya and Çivğın (2020) consists of four factors: "*Use=5, Access=4, Negativeness=4, Suitability for Purpose=5*" and a total of 18 items. It was prepared in a five-point Likert style with the answers "*Absolutely agree=5 ... Disagree=1*". The reliability of the scale was found to be .82, and it was found to be .83 in this research as well. The scale scores a maximum of 90 and a minimum of 18 points to participants.

Data Analysis

When applying the online questionnaire to the participants, the principle of volunteerism was respected and the identities of the participants were kept secret. The research data were obtained by applying the scales to the students studying from nine different programs at SCU-VSHS in the spring semester of 2020-2021. The data were analyzed using the SPSS and AMOS statistical package programs. For the assumption of normality, the Kolmogorov-Smirnov (K-S) test was used, and since normality values could not be obtained in some factors, the coefficient of skewness and kurtosis were checked. The coefficient of skewness and kurtosis were found to be within the limits of flexibility (±1.96). So the independent groups' t-test and ANOVA test, which are among the parametric statistical analysis methods, were applied (Kalaycı, 2014). Tukey analysis was used to determine the groups that were found to have significant differences in the ANOVA test. Tukey analysis is commonly preferred in research because it provides researchers to control the amount of error as the number of groups increases (Clever & Scarisbrick, 2001; Kayri, 2009). CFA analysis was applied to the scales to determine the effect of the technology use levels of the participants on their digital reading self-efficacy, and the scales were found to be within the accepted limits. Concordantly, the Structural Equation Model (SEM) was applied using the Maximum Likelihood

calculation method (Gürbüz, 2019). SEM analysis is in group describes as second-generation analysis techniques. The advantage of SEM is that it provides the solution to complex research problems in a single transaction (Bagozzi & Fornell, 1982). The path analysis method was applied to determine the fit of the variables in the model developed by SEM analysis. The results obtained whereby the analysis applied in the research are expressed in tables and figures with detail.

Research Ethics

The ethical permission of the research was obtained with the decision of the SCU Scientific Research and Publication Ethics Social and Human Sciences Committee, dated 07.06.2021 and numbered E-60263016-050.06.04-45661.

FINDINGS

The factor and item averages, standard deviation values, and reliability values obtained from the RTUS and DRSES of the students studying in the field of health are all expressed entirely in Table 2.

Table 2. Descriptive Statistics on Scales

	n	Lowest score	Highest score	$\overline{X}$	İtem average (1-5)	ss	Cronbach Alfa
RTUS	461	14	60	32.64	2.72	7.96	.81
DRSES	461	18	90	58.43	3.25	10.64	.83
Use	461	5	25	16.20	3.24	4.87	.87
Access	461	4	20	14.88	3.72	3.24	.74
Negativeness	461	4	20	12.80	3.20	3.74	.80
Suitability for Purpose	461	5	25	14.55	2.81	4.24	.81

According to the analysis of the scales in Table 2; it was determined that the average score of the students to RTUS was at a moderate level, and the average score of the students to DRSES was at a moderate level for use (usage), negativeness, and suitability for purpose factors and was at a high level for access factor. In addition, it was observed that the reliability values of the scale were generally at a high level.

The average scores of university students from the RTUS and DRSES were evaluated in terms of gender and class-level variables, and the Independent Groups t-Test results are presented in Table 3.

Table 3. Independent Groups t-Test Results by Gender and Grade Level Variable

	Gender	n	$\bar{x}$	ss	t	sd	p
RTUS	Female	372	32.68	7.90	.201	459	.841
	Male	89	32.48	8.24			
DRSES	Female	372	58.03	10.61	-1.650	459	.101
	Male	89	60.10	10.66			
Use	Female	372	16.02	4.93	-1.666	459	.098
	Male	89	16.93	4.58			
Access	Female	372	14.83	3.25	-.724	459	.470
	Male	89	15.10	3.22			
Negativeness	Female	372	12.71	3.82	-1.170	459	.244
	Male	89	13.19	3.38			
Suitability for Purpose	Female	372	14.47	4.27	-.827	459	.410
	Male	89	14.88	4.13			
	Class	**n**	$\bar{x}$	**ss**	**t**	**sd**	**p**
RTUS	1. 1nd grade	173	32.42	6.46	-.468	459	.640
	2. 2nd grade	288	32.77	8.74			

DRSES	1. 1nd grade	173	59.45	11.08	1.576	459	.116
	2. 2nd grade	288	57.81	10.34			
Use	1. 1nd grade	173	16.94	4.53	2.634	459	.009*
	2. 2nd grade	288	15.75	5.02			
Access	1. 1nd grade	173	14.57	3.21	-1.611	459	.108
	2. 2nd grade	288	15.07	3.25			
Negativeness	1. 1nd grade	173	13.27	3.56	2.123	459	.034*
	2. 2nd grade	288	12.52	3.83			
Suitability for Purpose	1. 1nd grade	173	14.67	4.36	.472	459	.637
	2. 2nd grade	288	14.48	4.18			

***p<.05**

When analyzing Table 3, according to the gender variable of the participants, there were no significant differences in the scores they received from both scales (p>05). It was determined that there was no significant difference in the scores of the students from the RTUS according to the class level variable, although there were significant differences in the scores they received from the DRSES in two factors (p<.05), and there was no significant difference in totally (p>.05). In the research, it was determined that H1, which was developed due to the P1 question, was not confirmed, and H2; while not verified for TUL, it was found to be verified for DRSE.

The results of the ANOVA test applied to the average score obtained by students according to the branch variable from the RTUS and DRSES are expressed in Table 4.

Table 4. ANOVA Test Results by Branch Variable

	Branch	**n**	**x̄**	**ss**	**Source of variance**	**sd**	**F**	**p**	**Significant differences**
RTUS	1. Child development	94	32.77	7.61	Between groups	8	1.925	.055	-
	2. Audiometry	59	32.49	6.93					
	3. Emergency and first aid	52	32.38	8.77					
	4. Medical imaging	78	34.91	7.70	Within groups	452			
	5. Dialysis	36	33.64	7.81					
	6. Operating Room Services	48	30.88	6.30					
	7. Physiotherapy	32	29.75	7.39					
	8. Laboratory techniques	30	31.00	7.47	Total	460			
	9. Dental prosthesis	32	33.38	11.62					
DRSES	1. Child development	94	57.64	10.67	Between groups	8	1.624	.116	-
	2. Audiometry	59	58.64	9.55					
	3. Emergency and first aid	52	58.10	7.92					
	4. Medical imaging	78	58.87	11.07	Within groups	452			
	5. Dialysis	36	56.47	7.24					
	6. Operating Room Services	48	58.35	10.75					
	7. Physiotherapy	32	62.38	12.29					
	8. Laboratory techniques	30	54.73	14.81	Total	460			
	9. Dental prosthesis	32	61.63	11.12					
Use	1. Child development	94	16.11	4.85	Between groups	8	.605	.774	-
	2. Audiometry	59	16.66	4.29					
	3. Emergency and first aid	52	15.38	5.14					
	4. Medical imaging	78	16.00	4.58	Within groups	452			
	5. Dialysis	36	15.53	4.25					
	6. Operating Room Services	48	17.00	3.99					
	7. Physiotherapy	32	16.63	5.40					
	8. Laboratory techniques	30	15.93	6.04	Total	460			
	9. Dental prosthesis	32	16.75	6.34					

Access	1. Child development	94	14.28	3.38	Between groups	8	5.538	.000	***3-1, *3-6, *3-8, *2-8, *4-8, *7-8, *9-8**
	2. Audiometry	59	14.93	3.07					
	3. Emergency and first aid	52	16.06	2.76					
	4. Medical imaging	78	15.47	3.47	Within groups	452			
	5. Dialysis	36	13.97	2.80					
	6. Operating Room Services	48	14.10	3.16					
	7. Physiotherapy	32	16.25	1.74					
	8. Laboratory techniques	30	12.73	4.03	Total	460			
	9. Dental prosthesis	32	16.00	2.33					
Negativeness	1. Child development	94	12.16	3.62	Between groups	8	1.905	.049	***7-1, *7-3,**
	2. Audiometry	59	13.20	3.18					
	3. Emergency and first aid	52	12.00	2.91					
	4. Medical imaging	78	12.62	3.94	Within groups	452			
	5. Dialysis	36	13.19	3.19					
	6. Operating Room Services	48	12.88	3.87					
	7. Physiotherapy	32	14.63	2.73					
	8. Laboratory techniques	30	13.47	4.93	Total	460			
	9. Dental prosthesis	32	12.75	5.07					
Suitability for Purpose	1. Child development	94	15.10	4.20	Between groups	8	1.989	.046	***9-8**
	2. Audiometry	59	13.85	3.89					
	3. Emergency and first aid	52	14.65	3.79					
	4. Medical imaging	78	14.78	4.38	Within groups	452			
	5. Dialysis	36	13.78	3.08					
	6. Operating Room Services	48	14.38	4.26					
	7. Physiotherapy	32	14.88	4.67					
	8. Laboratory techniques	30	12.60	5.16	Total	460			
	9. Dental prosthesis	32	16.13	4.56					

***p<.05**

When analyzing Table 4, it was determined that the scores obtained by the students from the RTUS did not differ statistically significantly according to the branch variable (p>.05). While there was no significant difference in total in the scores obtained by the students from the DRSES, it was determined that there were significant differences for the three sub-factors (p<.05). The H3 which is developed depending on the question P1, in the research; is not confirmed for TUL but is confirmed for DRSE.

Table 5 shows the results of the ANOVA test used to determine if the scores of students in the field of health from the RTUS and DRSES make a statistically significant difference based on daily internet usage times.

Table 5. ANOVA Test Results for Internet Usage Time Variable

	Time	**n**	**x̄**	**ss**	**Source of variance**	**sd**	**F**	**p**	**Significant differences**
RTUS	1.1-2 hours	268	32.91	8.25	Between groups	3	3.201	.023	***4-2**
	2.3-4 hours	161	31.67	7.48					
	3.5-6 hours	23	33.70	7.54	Within groups	457			
	4. 7 hours or more	9	39.33	4.03	Total	460			
DRSES	1.1-2 hours	268	57.85	10.06	Between groups	3	1.699	.166	-
	2.3-4 hours	161	58.62	11.80					
	3.5-6 hours	23	62.65	8.85	Within groups	457			
	4. 7 hours or more	9	61.22	7.90	Total	460			
Use	1.1-2 hours	268	15.87	4.75	Between groups	3	1.957	.120	-
	2.3-4 hours	161	16.56	5.13					
	3.5-6 hours	23	17.96	3.67	Within groups	457			
	4. 7 hours or more	9	14.78	5.47	Total	460			
Access	1.1-2 hours	268	14.87	3.43	Between groups	3	.949	.417	-
	2.3-4 hours	161	14.73	3.02					
	3.5-6 hours	23	15.43	2.21	Within groups	457			

	4. 7 hours or more	9	16.33	3.20	Total	460			
Negativeness	1.1-2 hours	268	12.57	3.62	Between groups	3	1.090	.353	-
	2.3-4 hours	161	13.05	3.87					
	3.5-6 hours	23	13.74	3.85	Within groups	457			
	4. 7 hours or more	9	13.11	4.57	Total	460			
Suitability for Purpose	1.1-2 hours	268	14.54	4.15	Between groups	3	1.617	.185	-
	2.3-4 hours	161	14.29	4.27					
	3.5-6 hours	23	15.52	4.42	Within groups	457			
	4. 7 hours or more	9	17.00	5.63	Total	460			

***p<.05**

When analyzing Table 5, it was found that there was a significant difference in the scores that students received from the RTUS, and this difference was in favor of students who used the internet for a longer period (p<.05). It was determined that student scores did not make a significant difference for DRSES both in total and for all factors (p>.05). The H4 which is developed depending on the P1 question in the research; was found that while it was confirmed for TUL, not confirmed for DRSE.

In line with the purposes within the scope of the study, CFA analyzes were conducted on both scales in order to determine whether the technology use levels of the students had a decisive effect on their digital literacy. The findings of the analysis are presented in Table 6.

Table 6. CFA Fit Index Values of Factor Structures

Model Fit Indices	**Acceptable Compliance Values**	RTUS	DRSES
		Values	Values
X^2/sd	0< X^2/sd< 5	3.84	3.28
RMSEA	0.00≤RMSEA≤0.08	0.07	0.07
NFI	0.90≤NFI≤1.0	0.90	0.88
CFI	0.90≤CFI≤1.0	0.92	0.91
IFI	0.90≤ IFI ≤1.0	0.92	0.91
GFI	0.85≤GFI≤1.0	0.94	0.90

When the model fit values in Table 6 were examined, it was determined that the results obtained were within the generally acceptable range. The factor structures of the RTUS and DRSES to be used in path analysis were confirmed by CFA analysis.

Table 7. Fit Values for RTUS-DRSES Structural Model

Model Fit Indices	**Acceptable Compliance Values**	**Model Fit Values**
X^2/sd	0< X^2/sd< 5	3.53
RMSEA	0.00≤RMSEA≤0.08	0.07
NFI	0.90≤NFI≤1.0	0.86
CFI	0.90≤CFI≤1.0	0.92
IFI	0.90≤ IFI ≤1.0	0.92
GFI	0.85≤GFI≤1.0	0.93

When the model fit values in Table 7 were examined, it was determined that the results obtained were within the generally acceptable range. The model fit values for the RTUS and DRSES were confirmed.

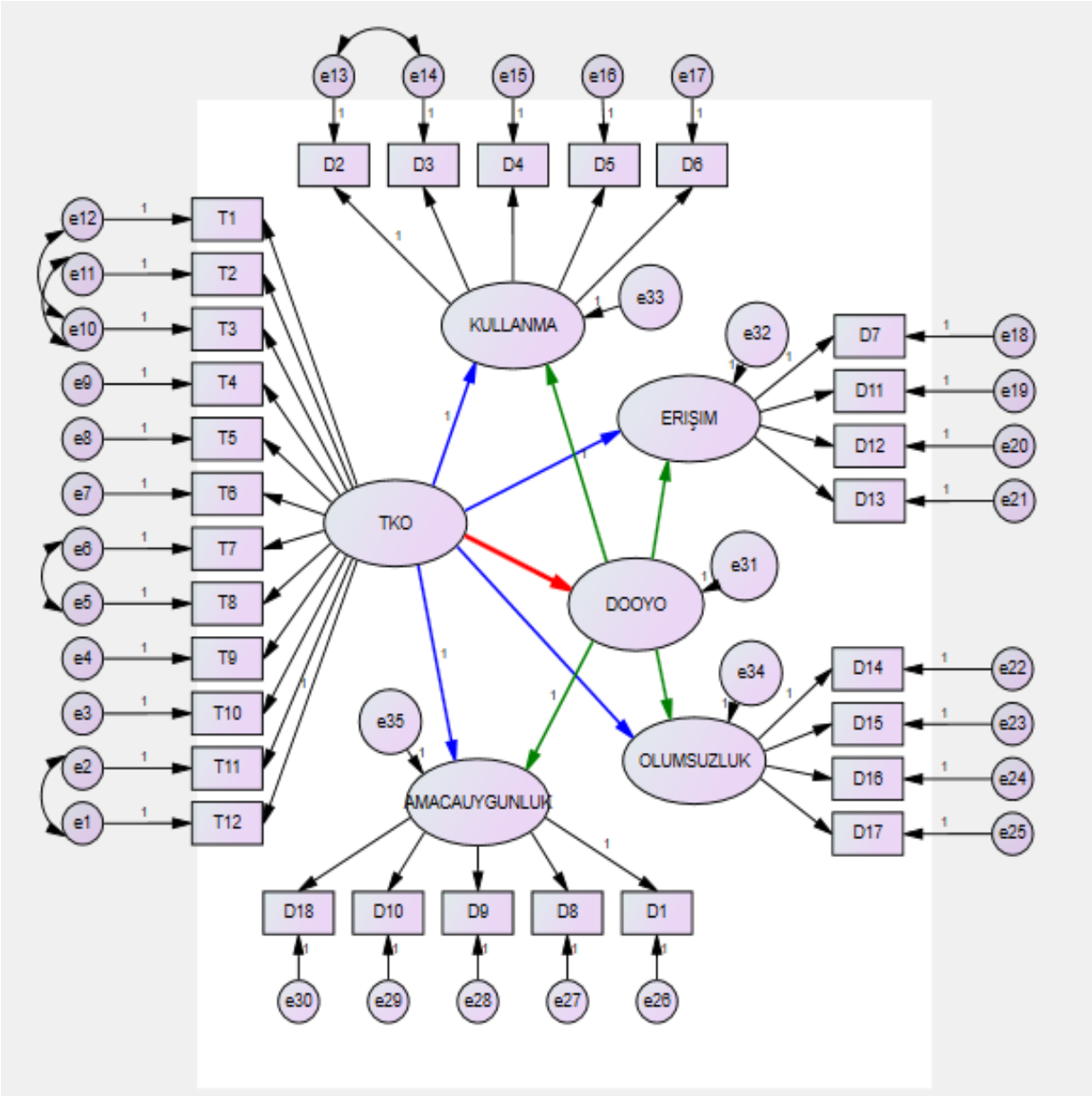

Figure 1. *Path Analysis Diagram*

Table 8. Structural Model Standardized Path Coefficients of the Research Model and Analysis Results

Hypothesis	Path		Estimate(ß)	S.E	C.R	p	Result
H1: RTUS	→	Use	1.117	0.040	5.392	0.000	**Accept**
H2: RTUS	→	Access	1.037	0.119	5.681	0.000	**Accept**
H3: RTUS	→	Negativeness	0.472	0.122	3.172	0.002	**Accept**
H4: RTUS	→	Suitability for Purpose	1.273	0.144	5.494	0.000	**Accept**

In Table 8, it was observed that the model was confirmed and the hypotheses of the research were tested in accordance with the structural model with implicit variables. The relationships between the factors of use, access, negativeness, and suitability for purpose of the RTUS and DRSES, "p" values of the were less than 0.05; this demonstrates that the correlations between factor attributions and latent variables are significant, in the analyzes. In the findings; it was found that the RTUS and DRSES positively affect the use factor (ß=1.117; p<.05), and positively affect the access factor (ß=1.037; p>.05), and positively affect the negativeness factor (ß=0.472; p<.05), and positively affect the suitability for purpose factor (ß=1.273; p>.05). According to the values of the regression coefficients, it was found that the students' technology use levels had a positive effect on their digital reading self-efficacy levels and statistically in all factors (p<0.05).

DISCUSSION & CONCLUSION

It was found that the average score of students on the RTUS was moderate level. The average score of the students from the DRSES; was determined that the total score was moderate for the factors of use, negativeness, and suitability for purpose, and the access factor was found to be at a high level. Additionally, it was found that the scale's reliability values were generally at a high level. In a study conducted by Aksoy (2018) on RTUS; in accordance with this study, it was found that the reliability of the scale meets the value found appropriate to use. It was found that the average score of students on the level of use of technology is compatible with previous studies (Aksoy, 2018; Seyitoğulları & Yalçınsoy, 2016; Zincirkıran & Tiftik, 2014).

It was determined that there were no significant differences in the scores that participants from the RTUS according to the gender variable. The result of Aksoy's study (2018) also supports the result of this study. In the study conducted by Karasakaloğlu, Saracaoğlu and Uça (2011), and Yılmaz, Üredi, and Akbaşlı (2015) for university students, similar results were reached in terms of the gender variables. It was found that the scores that students received from DRSES did not differ significantly in terms of gender variables. Ulu and Zelzele (2018) investigated students' self-efficacy for screen reading, and they did not find any significant findings in terms of gender. It can be considered that all young people studying at the university have to use technology in their education and that access to technology becomes very easy in this case is effective. It can be assumed that the fact that they are already performing digital reading in this sense on many platforms connected with technology also has an impact on this situation. Odabaş (2017) says that people perform reading the newspapers, magazines, news, novels, etc. on digital platforms nowadays. He even says that printed publications may lose their former importance after a while.

It was determined that there was no significant difference in the scores of the student got from the RTUS and DRSES according to the grade level variable in terms of total scores. The findings of the study conducted by Yılmaz et al. (2015), in order to determine the level of students' use of technology support the findings of this study. Because the technology has reached a point that it is accessible for everyone today, it proves that students are familiar with the technology before starting university education and that they already have competence in terms of many technologies. In parallel with this study, the results of the study conducted by Yıldız and Keskin (2016), for digital reading indicated that there were no statistical differences in class level.

It was found that there were no significant differences in the scores that students received from the RTUS and DRSES, based on the total score, in terms of the branch variable. However, it was found that there were significant differences in the scores of students on the DRSES in three sub-factors in total. Bulut and Karasakaloğlu (2019) investigated the digital reading tendencies of university students and found that there was a significant difference in terms of branch variables. It was found that there was a significant difference in the scores that participants received from RTUS according to the internet using time variable and this difference was in favor of students who used the internet for a longer time. It was determined that there was no significant difference in terms of DRSES. It was determined that this difference was in favor of students who used the internet for a longer time and that there was no significant difference in terms of DRSES. As internet usage time increased, significant differences were found in peoples' RTUS scores, while no significant differences were found in DRSES scores. This result coincides with the fact that students express that they use the internet, not for information or reading but rather to follow social media.

In this study, 25% of students stated that they used the internet mostly for following the lesson. 75% of the students state that they use the internet mostly for text messages with friends, watching movies, listening to music, and communicating with other people. Imren and Tekman (2020) investigated the impact of university students ' intensity of using technology on their cognitive abilities. They found that there was no difference in cognitive executive abilities of students who used technology for a longer time, but it affected maintaining attention and memory use.

CFA analyses of the scales used in the study were conducted, and it was determined that the fit values of the scales were ensured. Besides, model fit analysis was performed using the structural equation modeling of both scales. The produced model was found to be compatible. As a result of the path analysis, the fact that the "*p*" scores of the students in the relations between the use, access, negativeness, and suitability for purpose factors of the RTUS and DRSES were less than 0.05 indicates that the relations between factor attributions and latent variables are important. As a result, it was determined that the RTUS and DRSES had a positive effect on the factors of use, access, negativeness, and suitability for purpose. According to the values of the regression coefficients, it was

determined that the students' technology use levels had a positive effect on their digital reading self-efficacy levels with statistically in all factors. İmren and Tekman (2020) investigated the relationship between TUL and cognitive abilities of university students and determined that there was a low correlation between them.

A general evaluation of the research results showed that there were no significant differences in the total scores of students RTUS and DRSES, in all other demographic variables, except for the RTUS on the internet using time. However, it was determined that the RTUS had a positively significant effect on DRSES. Today, with including technology in educational environments, it is necessary to investigate these issues in learning environments; both in educational tools, educational methods, and techniques. In parallel with this research about digital reading self-efficacy, it is important to investigate many interrelated issues such as digital writing, digital listening, digital understanding, and digital presentation, together or with other factors. This study was performed at the university level. Şahenk-Erkan and Dağal (2018) investigated the opinions of university students about digital reading, digital writing, and digital presentation. They found that students had some negative thoughts as well as positive thoughts about understanding, interpreting, expressing, and presenting examples of what they read in digital environments. Although using technology in every field of education processes occurs somewhat quickly due to the coronavirus pandemic, the statements indicate that distance education applications will continue after the pandemic. In this direction, because distance education is provided at all levels of education during the pandemic, determining the positive and negative impressions of the educational process on digital reading and other issues will help the authority while preparing future curriculums.

Researchers' Contribution Rate

The study was conducted and reported by the corresponding author

Conflict of Interest

The authors of this article declare that there is not conflict of interest.

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BARÜ Bartın University Journal of Faculty of Education BUEFAD

2023, Volume 12, Issue 1, 85-96
dergipark.org.tr/buefad
DOI: 10.14686/buefad.1002223

Opinions of Pre-service English Teachers on Distance Practicum in the Covid-19 Period: An example from Turkey

Research Article
Received: 29.09.2021
Revised: 01.11.2022
Accepted: 25.12.2022

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ABSTRACT

Within the context of distant practicum procedures implemented during the coronavirus (COVID-19) period, the aim of this study is to highlight the experiences and views of pre-service English teachers on e-practicum. The study also examines whether pre-service teachers' experiences contrasted with what they expected from the standard practicum procedures. The participants of the study included 20 fourth-year prospective English teachers studying at a Turkish university. Data were collected through standardized open-ended interview questions and content analysis was used to categorize the responses. The findings of this study in general show that teaching practicum is a significant part of teacher education programs as pre-service teachers believe that it particularly supports gaining teaching experience in a real school environment. However, the outbreak of the COVID-19 pandemic has led to teaching practicum being sustained as a part of distance education, which has caused certain drawbacks, especially in terms of lacking face-to-face teaching experience. Findings revealed that distant practicum during COVID-19 had more negative sides for the participants than positive ones. Participants expressed their demands for e-practicum regulations that address all aspects of the teaching profession and give them the opportunity to put theory into practice.

Keywords: COVID-19, foreign language teacher education, practicum, pre-service teachers

Opinions of Pre-service English Teachers on Distance Practicum in the Covid-19 Period: An example from Turkey

ÖZ

Bu çalışmanın amacı, koronavirüs (COVID-19) döneminde uygulanan uzaktan öğretmenlik uygulaması süreci bağlamında, İngilizce öğretmen adaylarının çevrimiçi öğretmenlik uygulaması hakkında deneyimlerini ve görüşlerini ortaya çıkarmaktır. Çalışma aynı zamanda İngilizce öğretmen adaylarının deneyimlerinin daha önceki öğretmenlik uygulaması kapsamındaki beklentilerinden farklı olup olmadığını incelemektedir. Çalışmanın katılımcıları Türkiye'de bir üniversitede öğrenim gören 20 dördüncü sınıf İngilizce öğretmen adayından oluşmaktadır. Çalışmada veriler, standartlaştırılmış açık uçlu görüşme sorular yoluyla toplanmış ve verilen yanıtları sınıflamak için içerik analizi kullanılmıştır. Bu araştırmanın bulguları genel olarak, öğretmenlik uygulamasının özellikle öğretmen adaylarının gerçek bir okul ortamında öğretmenlik deneyimi kazanmayı desteklediğine inandıklarını, dolayısıyla öğretmen yetiştirme programlarının önemli bir parçası olduğunu gösterdiğini ortaya çıkarmıştır. Ancak, COVID-19 salgınının ortaya çıkması, öğretmenlik uygulamasının özellikle yüz yüze öğretmenlik deneyiminin yapılamaması açısından bazı dezavantajlara neden olan uzaktan eğitimin bir parçası olarak sürdürülmesine yol açmıştır. Katılımcılar, pandemi döneminin uzaktan öğretmenlik uygulamasını olumsuz açıdan etkileyerek genel anlamda öğretmenlik deneyiminden beklentileriyle çeliştiğini ifade etmişlerdir. Bulgular aynı zamanda, COVID-19 döneminde uzaktan öğretmenlik uygulamasının katılımcılara göre olumlu yönlerinden ziyade olumsuz yönlerinin daha fazla olduğunu ortaya çıkarmıştır. Katılımcılar, öğretmenlik mesleğinin tüm yönlerini ele alan ve onlara teoriyi pratiğe çevirme fırsatı veren çevrimiçi uygulama düzenlemeleri isteklerini dile getirmişlerdir.

Anahtar kelimeler: COVID-19, öğretmen adayları, öğretmenlik uygulaması, yabancı dil öğretmen eğitimi

To cite this article in APA Style:
Dündar, S. & Güvendir, E. (2023). Opinions of pre-service English Teachers on distance practicum in the Covid-19 Period: An example from Turkey. *Bartın University Journal of Faculty of Education, 12*(1), 85-96. https://doi.org/10.14686/buefad.1002223

INTRODUCTION

Second language (L2) teacher education has evolved and expanded significantly in recent years as a relatively new profession (Farrell, 2018). For a long time, L2 teacher education was dominated by the positivist view, which postulated that what effective teachers needed was "discrete amounts of knowledge, usually in the form of general theories and methods that were assumed to be applicable to any teaching context" (Freeman & Johnson 1998, p. 399). However, L2 teacher education witnessed a paradigm shift and the socio-constructivist view started to replace the positivist view. Consequently, teacher learning started to be viewed "as constructing new knowledge and theory through participating in specific social contexts and engaging in particular types of activities and processes" (Richards 2008, p. 164). As Burns and Richards (2009) stated, rather than viewing teaching and learning as the transmission of knowledge, the socio-constructivist paradigm approaches it as constructing opportunities for the construction of information and understanding through social involvement.

As a result of this paradigm shift, L2 teacher education programs now not only provide comprehensive academic and pedagogical knowledge on L2 education, but also provide pre-service teachers opportunities to experience a real-school environment through applications such as teaching practicum (Mirici & Ölmez-Çağlar, 2017). Taken in more depth, teaching practicum includes "supervised teaching, experience with systematic observation, and gaining familiarity with a particular teaching context" (Gebhard 2009, p. 250). It is considered a noteworthy part of a prospective teacher's educational life since it forms an introductory phase to the teaching profession and helps them to develop teaching skills and broaden their knowledge base on productive teaching practices (Collinson, Kozina, Lin, Ling, Matheson, Newcombe, & Zogla, 2009). Prospective teachers have the opportunity to become acquainted with real school environments, specifically with students, teachers, mentors, school administrators, and the school as an institution, through practicum. Numerous studies on teaching practicums found that practicums had a positive effect on pre-service teachers, such as familiarizing them with the teaching profession and fostering self-confidence (Guo & Wang, 2009), improving general teaching skills (Hascher, Cocard, & Moser, 2004), and classroom management skills (Pham, Nguyen, Ho, Hoang, & Pham, 2020). Thus, the outcomes of practicum overlap with the assumptions of the sociocultural perspective, which stresses that "knowing, thinking, and understanding come from participating in the social practices of learning and teaching in specific classroom and school situations" (Johnson 2009, p.13). Nevertheless, the sudden outbreak of COVID-19 prompted teacher education programs to re-conceptualize the practicum experience and search for alternative ways to ensure that prospective teachers are classroom ready (Sasaki et al., 2020). Different from other academic components which could be conducted through online and distance education, the practicum, being a practical activity in a classroom context, presented unique difficulties (Flores & Gago, 2020; Moyo, 2020). Following the outbreak of the pandemic, pre-service teachers had to stop their visits to educational institutions and had to track their mentors' activities online.

Some of the national, institutional, and pedagogical responses to the matter of practicum during the COVID-19 outbreak included using Virtual Reality (VR) technology in virtual classrooms (Sasaki et al., 2020), conducting microteaching tasks in virtual classrooms and receiving e-mentoring services (Ersin, Atay, & Mede, 2020), observing videos of classrooms and presenting online classes (Kim, 2020), conducting and following synchronous teaching activities (Flores & Gago, 2020), teaching to family members and friends, children in the nearby neighbourhood or local community, and composing TED-type mini lessons (Donitsa-Schmidt & Ramot, 2020), and even suspending the practicum and postponing it to future periods (Chan, 2020). When analyzed collectively, it is notable that all of these interventional approaches to the disadvantages imposed by the COVID-19 were structured around a distance and digitalized practicum model, which differed from the conventional practicum conducted in a real school context. Although a lot of attention has been paid to the COVID-19 and distance education recently, there is a small number of research that focuses on the positive and negative aspects of the distance practicum. Currently, the question that needs to be answered is whether or to what extent students benefited from the practicum applications they took part in during the pandemic. Therefore, even micro-level studies that focus on pre-service teachers' views in specific institutions are needed to address the pros and cons of distance practicum and students' suggestions for the improvement of digitalized practicum applications. Learning pre-service teachers' opinions about these practicum applications will provide researchers and educators with more viable ideas in the long run. Studies that address pre-service teachers' thoughts on the latest e-practicum practices will guide the authorities in case the COVID-19 process is prolonged or a similar situation is encountered in the future. Thus, it will be possible to identify the deficits in those practicum applications and search for alternative solutions to the issue of distance practicum when confronted with comparable circumstances.

CONTEXT AND RESEARCH FOCUS

In Turkey, pre-service teachers are required to take the 'School Experience Course' in the first semester and subsequently the 'Teaching Practice Course' in the second semester of their fourth year at foreign language teacher education programs (Yüksek Öğretim Kurumu [YÖK], 2007). 'School Experience Course' is merely based on experiencing the real-school environment through observation, and it requires prospective teachers to carry out certain tasks each week, such as observing teachers and students, improving teaching skills through observation, and getting acquainted with the school and school management. On the other hand, 'Teaching Practice Course' requires conducting the teaching activity itself at schools. In undergraduate programs, this course is 112 hours in total, including 6 hours of practice each week (84 hours in total) and 2 hours of theory (28 hours in total). According to the directive jointly prepared by the Turkish Higher Education Council (HEC), National Teacher Training Committee and Ministry of National Education (MoNe) Teacher Training and Development General Directorate, student teachers are expected to attend practicum regularly for at least 12 weeks and to teach courses at least 4 times in different weeks under the supervision of their mentor teacher and university supervisor. The university supervisor and the mentor teacher are also expected to collaborate and provide assistance to pre-service teachers.

Regarding the Turkish context, a large body of research illustrated that the teaching practicum format applied in L2 teaching programs had a positive effect on pre-service students in terms of changing their perceptions of the teaching profession (Köksal & Genç, 2019), boosting their self-confidence and competence in teaching (Yıldız, Geçikli, & Yeşilyurt, 2016), learning to establish student-teacher interaction (İşcan, 2017), improving their classroom management skills (Atay, 2007), enhancing self-efficacy and identity development (Kırmızı & Tosuncuoğlu, 2019), and having opportunities for discussion and peer feedback (Celen & Akcan, 2017). However, with the spread of COVID-19, teaching practicum was conducted through online distance education practices. Almost all educational institutions in Turkey, including both k-12 and higher education, were exposed to closures after March 23, 2020, and had to resume education through distance learning. Up to that point, pre-service teachers had a chance to actively carry out practicum activities only for 6 weeks. According to a consensus made between MoNe and HEC (YÖK, 2020), teaching practicum was considered as completed regarding the actively involved time period and practicum activities conducted at schools. Furthermore, the consensus stated that the theoretical part of the 'Teaching Practice Course' should be sustained through distance education and pre-service teachers should complete their practicum files by doing tasks assigned by their university supervisors. Consequently, Turkish universities designed distance education tasks and activities for pre-service teachers to fulfil the rest of their practicum weeks (Ersin, Atay, & Mede, 2020).

In the institution where the current study was conducted, these practicum practices included tasks such as conducting research on classroom management and writing a review or article on teaching methods and questioning techniques. Students were also asked to prepare a sample exam and answer key for one of the lessons given on EBA TV, which refers to an online education platform directed by MoNe. Moreover, they were required to observe an English lesson on EBA TV and write a critical report about it. They were also asked to create lesson plans and self-evaluation reports for the courses taught during the first weeks of the semester. Other tasks included preparing a lesson plan and digital materials based on the experiences gained during the first 6 weeks at school and designing a sample lesson of 15–30 minutes to be used in a digital environment. Student teachers were expected to do these tasks and upload them to the university's online system each week. Supervisors were also required to mentor student teachers by uploading the weekly course content to the online course system, teaching asynchronously, and giving feedback when necessary.

Within the context of these online practices conducted during the COVID-19 period at a Turkish university, the purpose of this study is to explore if pre-service English teachers' e-practicum experiences diverged from their expectations for the practicum experience. Therefore, the study focuses on the positive and negative aspects of the distant practicum for the participants in this study and highlights their suggestions for improving the applications for distance practicums. The study specifically covers the following research questions:

1. What were the pre-service L2 teachers' expectations from the teaching practicum before COVID-19?
2. What are the strengths and weaknesses of the distance practicum applications during the COVID-19 outbreak compared to face-to-face education?
3. What are the suggestions of the pre-service L2 teachers regarding the distance practicum in the case of a similar process?

METHOD

Research Design

This study has a qualitative phenomenological research design. Phenomenological research designs try to conceptualise human experience by analysing the descriptions, perceptions, feelings, or judgments of individuals (Patton, 2015). Hence, a qualitative phenomenological research design was used in this study to reveal the lived experiences of the participants in the distance practicum process. Standardized open-ended interview questions were used to collect data from pre-service L2 teachers at the end of the 2019-2020 academic year. The study used 'qualitative content analysis' to get "the subjective interpretation of the content of text data through the systematic classification process of coding and identifying themes or patterns" (Hsieh & Shannon, 2005, p. 1278).

Participants

The participants of the study included 20 fourth-year pre-service teachers (13 females and 7 males) studying English Language Teaching at a Turkish university during the 2019-2020 academic year. All the participants volunteered to take part in the research. The study used convenience sampling to select the participants. In convenience sampling, "members of the target population are selected for the purpose of the study if they meet certain practical criteria such as geographical proximity, availability at a certain time, easy accessibility, or the willingness to volunteer" (Dörnyei, 2007, p. 98). The average age of the participants was 22. The participants were guided by four different university supervisors and were expected to complete their teaching practicum at five different state schools, including all levels of education (i.e., primary, secondary, and high school) in Edirne, Turkey.

Data Collection

Data were collected through standardized open-ended interview questions. Thus, the exact wording and sequence of questions were specified beforehand, and interviewees were directed to the same basic questions in the same order. Interview questions were expressed in an entirely open-ended design. Using a standardized open-ended interview strategy has several advantages, such as increased comparability of responses, reduced interviewer effects and bias, and easier organization and analysis of the data (Fraenkel, Wallen, & Hyun, 2012). In this respect, three key interview questions were asked of interviewees by the researchers by the time they completed their online 'Teaching Practice Course'. As all the participants' native language was Turkish, the interviews were conducted in Turkish to make them feel more confident and express their thoughts without hesitation. The questions were emailed to the participants, and they were requested to audio-record their responses. One of the researchers, who is fluent in both Turkish and English, then transcribed and translated the data into English. Following the translation procedure, another bilingual Turkish-English speaker also compared the original text and the translated versions. The number of words across all participants was 13,427, and the mean number of words produced by participants in the interviews was 671,35.

The following interview question was addressed to the participants to highlight the first research question of the study:

1. What did you expect from the teaching practicum process before the COVID-19 outbreak?

In order to examine their views on the positive and negative aspects of the COVID-19 on their practicum experiences, the following interview question was directed to the participants:

2. What were the negative and positive aspects of the distance practicum applications during the COVID-19 outbreak?

In line with the third aim of the study, the researchers directed the following research question to the participants:

3. What are your suggestions for the improvement of distance practicum applications?

For data analysis, qualitative content analysis was used in order to examine the transcriptions. Conducting content analysis includes: 1) coding the data, 2) determining themes, 3) categorizing codes and themes, and 4) identifying and interpreting the findings (Yıldırım & Şimşek, 2018). Transcribed data were examined in detail and codes were determined by two raters. The themes coded by the raters emerged from the examination and evaluation of the interview data. Following the coding procedure, inter-coder reliability was calculated. Inter-coder reliability is "the extent to which different judges tend to assign exactly the same rating to each other" (Tinsley & Weiss, 2000, p. 98). Cohen's Kappa value was used to measure inter-coder reliability in this study and it was found to be .93, which signifies a strongly acceptable value (Lombard et al., 2010). Cohen advised that the Kappa result be interpreted as follows: values 0 showing no agreement, 0.01–0.20 suggesting none to slight agreement, 0.21–0.40 signifying moderate agreement, 0.41–0.60 indicating strong agreement, and 0.81–1.00 indicating nearly perfect agreement (McHugh, 2012). The categories and codes figured out through rater agreement are presented in the

following tables (see Tables 1, 2, and 3). Direct quotations from the participants are presented to reflect the transferability of the categories and the codes.

Research Ethics

This research study complies with research publishing ethics. The scientific and legal responsibility for manuscripts published in Bartın University Journal of Faculty of Education belongs to the authors.

FINDINGS

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Participants' Overall Expectations From Teaching Practicum Prior to The Covid-19 Pandemic

The first interview question aimed to identify the expectations of the participants from the teaching practicum experience before the COVID-19 outbreak. As a result of the content analysis, one main category and seven codes were formed (see Table 1).

Table 1. Overall expectations of the participants from teaching practicum before COVID-19.

Categories (Themes)	Codes	n	%
Expectations	1. Practice opportunities	11	55
	2. Real classroom atmosphere	10	50
	1. Gaining experience	8	40
	2. Interaction with students	7	35
	3. Making observations for professional development	6	30
	4. Supervision	5	25
	5. Classroom management	4	20

Results on Table 1 show that 55% (n = 11) of the participants expected that teaching practicum would give them practice opportunities and they would be able to put the knowledge base they had constructed during their university education into practice. As participant 20 stated, *"practicum is a very valuable process that presents opportunities for teaching practice. Theoretical knowledge is actually useful to some extent".* Similarly, participant 2 expressed that, *"with the feedback we received from the experienced teachers, I expected to put the teaching techniques and methods into practice and complete my development as a prospective teacher".* Participant 9 said that, *"I was expecting to gain experience in terms of teaching practice".*

50% (n = 10) of the participants thought that teaching practicum would provide them with the experience of being in a real classroom atmosphere. As participant 17 reported, *"I think teaching is mastered in the classroom. No matter how much you learn in theory, teaching is improved in the classroom, and my general expectations were to be in the classroom with the students".* Correspondingly, participant 14 stated that, *"before the pandemic, my expectation of the practicum was to apply what I had learned at the university in a real educational environment".*

Gaining experience was another expectation that 40% (n = 8) of the participants had in relation to the teaching practicum. Participant 1 said that,

I think taking an active part in the school contributes a lot in terms of gaining experience as it enables me to teach how to perform in a real educational setting. So, I expected to learn more from experienced school administrators and teachers.

Participant 5 reported that *"My expectation was to gain experience by learning how to act as a teacher and work with students at schools".*

Similarly, participant 12 asserted that *"Practicum was a chance for me to apply teaching skills in a real educational environment. So, it would be beneficial to gain experience from qualified teachers by getting involved in the school and classroom activities effectively".*

The fourth expectation that 35% (n = 7) of the participants had was to establish interaction with real students. As participant 15 put it, *"my aim was to communicate with the students. It was necessary for me to learn what kind of reactions we should give in different situations".* Participant 16 also stated that, *"I wish I could be in communication with students more. Because in the real classroom environment, students are so different and I planned to do a lot of things with them".* Similarly, participant 19 stated that *"during this period, I actually aimed to communicate with the students one-by-one and to observe their learning process".*

A total of 30% (n = 6) of the participants stated they considered the teaching practicum as a chance to make observations for professional development. As participant 10 put it,

First of all, my expectation from the practicum was to be able to observe the school environment, the teachers, the students, and the classroom environment closely. I wanted to observe the teachers, especially the experienced ones. I wanted to observe things such as how they plan their lessons, how they carry out the lesson, apply different methods and techniques, and communicate with their students.

Similarly, participant 12 stated that *"what I expected from the practicum before the pandemic was to be able to effectively observe school and classroom environments".*

Supervision was another expectation that 25% (n = 5) of the participants had from the practicum before the spread of the pandemic. As participant 13 stated,

before the pandemic, my expectation of the practicum, as I heard from previous graduates, was that we would have meetings with mentors and supervisors each week. During the practicum, our mentor and supervisor would guide us, we would share and talk about the problems we were experiencing. I had such high expectations.

Likewise, participant 1 pointed out that, *"apart from gaining experience, it was also in my expectations that both the administrators and the teachers would help and guide us during the practicum process".*

The final expectation that 20% (n = 4) of the participants had was to improve themselves in terms of classroom management. These participants had several concerns regarding how to handle classroom management in real classroom settings, and they were expecting to test themselves. As participant 17 stated, "*one of my major expectations from the practicum was to learn about the possible future problems in classroom management and also to learn how to deal with them".* Participant 1 also said that, *"one of my expectations from the practicum was to improve myself more in terms of classroom management".*

Positive And Negative Sides of The Distance Practicum

The second interview question asked the participants to refer to the strengths and weaknesses of the practicum application during COVID-19. Participants' responses were categorized into two sections as positive and negative aspects of the process, and a total of 7 codes were formed (see Table 2).

Table 2. Evaluation of the teaching practicum process after COVID-19.

Categories (Themes)	Codes		n	%
Positive Aspects	1.	Chance to observe online lessons	4	20
	2.	Flexibility of time and place	4	20
	3.	Experience in distance education	1	5
Negative Aspects	4.	Theoretical focus and lack of practice	12	60
	5.	Lack of having face-to-face interaction	10	50
	6.	Lack of mentor/supervisor support	4	20
	7.	Internet access	3	15

Opportunities

Regarding the positive aspects of the practicum process during the pandemic, 4 pre-service teachers (20%) stressed that the distance practicum process provided them with the chance to observe online lessons. Hence, they had the chance to evaluate the limitations and advantages of these applications by monitoring the distance education process. As participant 4 stated, *"I think the strength of this process is that we prepared a lesson plan when we were not teaching, watched EBA TV, and made comments about the online lessons".* Likewise, participant 7 stressed that "the strength of the practicum is observing lessons on broadcasting platforms such as EBA TV".

A total of 20% (n = 4) of the participants found the online tasks that they had to do as a part of the distance practicum easy and considered this an advantage. In particular, the flexibility of time and place made it easier for the participants to complete the desired tasks. As participant 8 stated,

First of all, let me start with the strength of the process because I think there is only one; that is, we were less stressed while preparing the practicum file. Normally, while preparing the file, it takes a lot of time because the

exams, the school, and the practicum are continuing at the same time. We do not need to attend a practicum right now; the practicum and other exams are all online. That's why we are more comfortable with that.

Participant 2 also reported that, "I think the only positive aspect of the distance practicum is probably that I had a more informal practicum as I did the assignments online from wherever I wanted".

The other positive aspect that 5% (n = 1) of the participants addressed was having experience in the implementation of distance education. As participant 10 stated, *"with regard to the strengths of the process, we have witnessed how distance education can be progressed and we have gained distance education experience as students. We have experienced the things that could be done at home".*

Challenges

On the other hand, most pre-service teachers declared that distance practicum during pandemic had certain handicaps. More than half of the participants (60%, n = 12) stressed that practicum in the pandemic period was mainly based on theoretical tasks and lacked practical applications. As participant 6 put it,

I think the pandemic process affected the practicum in a negative way. Since practicum is an applied course, we were negatively affected by its theorization. From my point of view, involving students in lessons and having fun while teaching is something totally different from writing articles about practicum.

Similarly, participant 7 argued that,

Unfortunately, my practicum experience during the pandemic did not make a great contribution to me. Actually, it was terrible. The reason is that we have been learning the theoretical part of the related courses for years. But as we all know, practice is very different from theory.

Half of the participants (n = 10) stated that they saw the practicum experience as a process where face-to-face interaction with students and mentor teachers was provided and they had expectations in that regard. However, decontextualization of the practicum eliminated their chances to take part in these interactional environments which further caused disappointment for them. As participant 8 put it, "one of the disadvantages of this process is that we, as pre-service teachers, could not gain any experience as a teacher since we could not meet with students in a real classroom setting". Participant 2 also noted that, "the practicum experience was terrible and exhausting. Because as a pre-service teacher, we were far from real school environment and lost our chance to interact and experience face-to face interaction with both our instructors and students". Similarly, participant 13 expressed that,

I think there was no advantageous situation; we were completely in the disadvantaged group. They asked us to observe lessons from EBA TV for the practicum, but there were no students there, there was no interaction, so it was a very artificial environment.

A total of 20% (n = 4) of the student teachers asserted that they did not get enough mentor teacher and university supervisor support, which caused them to feel isolated during the distance practicum process. As participant 11 pointed out,

We had some assignments, such as preparing a practicum dossier. However, when we asked our supervisor questions about the assignment, he never contacted us... Actually, many people did their assignments differently, so 8–9 people in my group completed their files very differently from each other. The only reason for this was that the questions we asked were not answered.

Similarly, participant 8 reported that, *"our supervisor informed us about how we should prepare our practicum dossier in the final week of the semester…We had no contact with our mentors; they never sent us messages or responded to our questions."*

Problems related to Internet connectivity were mentioned by 15% (n = 3) of the participants. These students stated that the practicum required Internet access, and some students had no or limited access to the Internet. As participant 20 put it,

Not everyone can get on the Internet the same way, and not all students have access to the Internet. Some of my friends returned to their villages, where they had no Internet access. Also, some students had a lot of problems while uploading their assignments, and some of them could not even submit them.

Student Recommendations

The final interview question aimed to identify the suggestions of the participants regarding the distance practicum in the case of a similar process. In this respect, two categories and seven codes were formed (see Table 3).

Table 3. Possible Solutions and Implications

Categories (Themes)	Codes		n	%
Modifications required	6.	Format of online teaching	10	50
	7.	Theoretical tasks	4	20
	8.	Organization	1	5
Suggestions	9.	Compensation education	5	25
	10.	Providing online communication opportunities	2	10
	11.	Resource support	2	10
	12.	Student coaching	1	5

Modifications

The findings on Table 3 in relation to the first category show that the participants would have modified certain practicum procedures if they had been given a chance. Accordingly, 50% (n = 10) of the participants stressed that the format of the online teaching practicum should have been different. Namely, the participants demanded that the practicum should have been performed through online teaching platforms in which they could have gotten in contact with real students and classroom-related issues. As participant 4 put it,

When we were informed that there would be distance education practicum applications, I thought that there would only be online lessons and lectures in the form of live conferences, but this was not the case. If it had been done through online lessons, I think it would have been much more useful in terms of motivation and socialization.

Participant 14 also asserted that,

If I had had the chance to make changes in the process, I would not have restricted the process to preparing lesson plans in the teaching part. I would have preferred a one-on-one online live class with our university supervisor and our mentor at the practicum school.

In parallel with this view, participant 1 stated that, "with the help of our mentors, we could have taught our classes through an online platform".

Another point that 20 % (n = 4) of the participants would have changed was the theoretical tasks that they had to complete during the practicum. As participant 7 put it, *"I would have eliminated theoretical assignments, because we, as students, have been doing this for years"*. Likewise, participant 1 said that, *"I would have definitely gotten rid of the assignment system. Because I don't think these assignments contributed to us in any way, as they were too theoretical"*.

Overall organization of the practicum process was criticized by one of the students, who stated that the university and faculty administration were too slow in taking the necessary steps to put a more effective distant practicum model into practice. The participant also thought that the university supervisors should have been informed systematically by the administration about the responsibilities that they and their students had.

Suggestions

In the context of the second category, the participants made a few suggestions that they believed could be implemented in the future. In this sense, 25% (n = 5) of the pre-service teachers suggested that compensation education should be done to fill the gaps created by the distance practicum. Participant 9 reported that,

During this crisis period, I observed that the practicum was not compatible with its nature. But in my opinion, instead of graduating without getting anything or learning anything in this way since our practicum is left unfinished, it could be completed in some way, either by delaying the period, that is, delaying the practicum for another period, or by performing the practicum in private institutions when normalization begins instead of leaving it like this.

Moreover, 10 % (n = 2) of the participants asserted that pre-service teachers should be provided with online communication opportunities that will maximize contact among pre-service teachers, university supervisor,

mentor teacher, and other students. As put forward by participant 19, *"I would like to do something like a meeting or an interview with my supervisor in a digital environment"*. Participant 8 also stated that *"talking to the students at least once a week would be nice, as we would get a chance to see who the real students are"*.

A total of 10% (n = 2) of the participants reported that pre-service teachers should be provided with the necessary resources in order to minimize the material-related drawbacks of distance practicum. Supporting this view, participant 8 said that, *"If I had a position at the higher levels of the state, I would somehow ensure that all students have computers and Internet access at their homes"*.

The final suggestion that one of the participants made was to integrate a student coaching model in which each pre-service teacher kept in touch with at least one student and monitored and guided her/his progress. As he put it,

At least we could do something like coach a student in the classrooms we attended. So at least we could observe one student, communicate with her/him, exchange ideas on homework assignments. We could communicate with them or instruct them about the topics they have problems with. In short, a distance education model where a high level of interaction with students takes place would be useful.

DISCUSSION & CONCLUSION

This study examined the experiences and opinions of prospective English teachers regarding the online practicum procedures conducted during the COVID-19 process. Participants, in general, think that the COVID-19 process affected their teaching practicum in negative ways that contrasted with their overall expectations of the practicum experience. The findings for the first purpose of the study reveal that prospective L2 teachers saw the practicum process as an experience of applying theoretical knowledge to practice and preparing themselves for the teaching profession with the in-class practices they conduct and the social and institutional relationships they establish. Hence, the participants' expectations of the teaching practicum were in line with the socio-constructivist view, which approaches teacher education as a process of building knowledge and skills through partaking in certain social environments and engaging in particular kinds of actions and practices (Richards, 2008). The expectations of the students from the practicum also coincided with the results of the studies conducted on the effects of the practicum on prospective teachers, which underscored that the practicum prepared the prospective teachers for the teaching profession by providing them with opportunities to put theory into practice and integrate them into a school context where they become familiar with all the stakeholders of education (Gebhard, 2009; Mirici & Ölmez-Çağlar, 2017).

The findings on the second research question of the study show that teaching practicum experience during the pandemic produced more negative results for the participants than positive ones. Considering the positive aspects of distance education, pre-service teachers indicated that they had the chance of observing online lessons on several broadcasting platforms, had a flexible program for doing the online assignments, and experienced how distance education was done. Participants, on the other hand, faced a number of significant challenges, including a lack of teaching practice, dealing with theory-oriented assignments, and missing opportunities to establish face-to-face interaction in an authentic classroom setting. These negative results both diverged in a completely different direction from the participants' previous expectations and showed that the positivist view centred on theoretical knowledge (Freeman & Johnson, 1998) once again largely involved in their education process. Therefore, within the margins of this study, the findings obtained show that the COVID-19 process caused a shift from a socio-constructivist view to a positivist one in L2 teacher education. This shift constitutes a problem since it took many years for L2 teacher education to evolve and internalize the view that teacher education includes not only realizing the skills and knowledge of language teaching regarding theory and pedagogy and their implementation in teaching but also noticing the concept of being a teacher by developing the identity of the teaching profession in a specific context in order to become effective teachers (Richards & Farrell, 2011). Therefore, educators need to shape their practices carefully by evaluating the educational philosophies and paradigm shifts that have taken place in particular fields, even in times of unprecedented crisis such as COVID-19.

In addition to these negative aspects, some of the participants complained about not getting enough support from their university supervisors and school mentors. Although the unresponsiveness of supervisors and mentors is an issue to be considered, other reasons behind these behaviors also need to be investigated by researchers. For example, a recent study by Duraku and Hoxha (2020) aimed to draw the attention of scholars to how the pandemic might have caused changes to teachers' and teacher trainers' emotional states and affect the quality of remote or online learning, teacher performance, and student knowledge and skills. Therefore, when a similar problem such as the unresponsiveness of supervisors is encountered, it is necessary to examine this problem in a multidimensional approach with all its elements.

Participants' responses to the third interview question produced several modification requests and suggestions that primarily addressed their solutions to the problems they encountered during the practicum. The majority of these modifications and suggestions were about creating more opportunities to put the theoretical knowledge they had into practice. Hence, they demanded major changes in the format of the online practicum and stated that the design of the practicum should have involved activities that would have helped them interact with students and teachers even on an online platform. They also criticized theory-based assignments as they emphasized that they were mostly in need of practice-based tasks that would be more fruitful for improving their teaching skills. As Johnson (2009, p.11) put it, the knowledge base of L2 teacher education programs should focus on three extensive parts: "(1) the content of L2 teacher education programs: What L2 teachers need to know; (2) the pedagogies that are taught in L2 teacher education programs: How L2 teachers should teach; and (3) the institutional forms of delivery through which both the content and pedagogies are learned: How L2 teachers learn to teach." The modification requests and suggestions of the participants show that while the practicum practice covered the first two parts of Johnson's proposal, it did not address the third component. Accordingly, some of the pre-service teachers even demanded compensation education as they thought that the practicum practice did not end the way they had anticipated as they could not experience face-to-face practicum. So, they still did not feel ready for the teaching profession at the end of their practicum. One of the interesting and valuable recommendations was online student coaching, which would enable them to monitor the progress of real students and provide guidance when needed. Supporting this view, several studies have shown that online coaching in education can be very useful and promote higher-order thinking (Stembom, Jansson, & Hulkko, 2016).

If conditions do not allow pre-service teachers to meet real students, even on online platforms, alternative useful practices that have been applied by other institutions can be used. For example, Sasaki et al. (2020) used a technology-based simulated classroom to support the practicum experience of pre-service teachers. Their study findings revealed increased levels of self-confidence and placement readiness for all study participants as a result of the simulation. In another study, Ersin et al. (2020) used a virtual classroom in which twenty-five pre-service English teachers acted as students and six pre-service teachers did microteaching to their peers. Following the e-practicum meetings, peers provided comprehensive feedback to the presenters, and the university supervisor delivered e-mentoring following the microteaching activities. Subsequently, each pre-service teacher reflected on their e-practicum experiences and e-mentoring procedures. Their study results revealed that pre-service teachers found the e-practicum valuable as it facilitated them to overcome their online teaching concerns. As the number of studies examining the effects of COVID-19 on practicum increases, institutions and planners should turn to the relevant literature, evaluate successful practices carried out by others, and create new regulations accordingly. In line with this argument, the current study also revealed that the faculty and school administration were not organized enough to sustain a successful practicum process during the pandemic. Although this sudden health crisis has led to confusion in every walk of life, it is necessary to make plans that are shaped around the main objectives of L2 teacher education and take other successful practices as a model.

Implications

The findings of this study in general show that teaching practicum particularly promotes gaining teaching experience in a real school atmosphere. However, the unexpected emergence of the COVID-19 pandemic has led to teaching practicum being sustained as a part of distance education, which has caused certain drawbacks, especially in terms of lacking face-to-face teaching experience. Thus, the present study highlighted pre-service teachers' expectations from teaching practicum and the challenges they have had in practicum during the pandemic. In accordance with the results of the study, the following suggestions for teacher education programs can be put forward:

1. Practicum should be carried out by creating a real classroom environment, even in an online setting,
2. Online practicum should involve practice-based activities rather than assigning pre-service teachers theoretical tasks,
3. Pre-service teachers should be provided with more communication and interaction opportunities with students and teachers on online platforms,
4. Faculties of education and schools should take necessary precautions in collaboration with each other and organize the process in terms of providing an effective teaching and learning environment for students,
5. Pre-service teachers should be regularly guided by mentors and supervisors,
6. Pre-service teachers having problems with technical equipment such as the Internet, computers, etc. should be supported by the institutions.

This study only included a small group of student teachers enrolled in a language teacher education program at a Turkish university. Further research with more participants and with different data collection instruments

regarding practicum during the pandemic will be useful for generalizing the results to larger contexts. Although there has been a lot of interest in COVID-19 and distance learning, very few studies focus on practicum. However, since the practicum experience has been situated in school-based contexts, more research is needed on how the teaching practicum is affected by distance education, what students' prerequisites are during this process, and how successful practicum procedures are carried out in different institutions.

Statements of Publication Ethics

Ethical compliance approval was obtained for this research in accordance with the decision of Trakya University Ethics Committee dated 07.07.2021 and numbered 6/12.

Researchers' Contribution Rate

The first author participated in the data collection, data analysis and writing (original draft) process of the research. The second author contributed to data analysis and writing- review and editing of this manuscript.

Conflict of Interest

There is no conflict of interest.

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BARÜ Bartın University Journal of Faculty of Education BUEFAD

2023, Volume 12, Issue 1, 97-110
dergipark.org.tr/buefad
DOI: 10.14686/buefad.973911

The Relationship between School Administrators' Learning-Centred Leadership Attitudes and Teachers' Organizational Identity Perceptions

Research Article
Received: 23.07.2021
Revised: 02.01.2022
Accepted: 02.01.2022

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ABSTRACT

This study aimed to reveal whether there is a significant relationship between the learning-centred leadership behaviours of school principals and teachers' perceptions about organizational identity according to teachers' views. 266 teachers working in secondary education institutions in the central district of Bolu province in the 2020-2021 academic year who voluntarily participated in the study make up the sample of this relational survey research study. Data were collected through learning-centred leadership scale and teacher organizational identity perception scale together with the personal information form. When the result of the research is examined, teachers' perceptions of learning-centred leadership and organizational identity are high. Variables such as gender, working time at the school, working time with the school principal did not make difference in teachers' views on learning-centred leadership and organizational identity perceptions; while the seniority variable created a significant difference in the teachers' views on learning-centred leadership in the sub-dimensions of providing learning support, managing learning programs and being a model, and it did not make difference in their perceptions of organizational identity. There is a positive, meaningful relationship between learning-centred leadership and organizational identity.

Keywords: Learning-centred leadership, organizational identity, teacher

Okul Yöneticilerinin Öğrenme Merkezli Liderlik Davranışları ile Öğretmenlerin Örgütsel Kimlik Algıları Arasındaki İlişki

ÖZ

Araştırmada öğretmenlerin görüşlerine göre okul müdürlerinin öğrenme merkezli liderlik davranışları ile öğretmenlerin örgütsel kimlik algıları arasında anlamlı bir ilişki olup olmadığını ortaya çıkarmak amaçlanmıştır. İlişkisel tarama yönteminin kullanıldığı araştırmanın çalışma evrenini 2020-2021 eğitim öğretim yılında Bolu ili merkez ilçede bulunan orta öğretim kurumlarında görev yapan ve çalışmaya gönüllü olarak katılan 266 öğretmen oluşturmaktadır. Araştırmada veri toplama aracı olarak kişisel bilgiler formu ile birlikte öğrenme merkezli liderlik ölçeği ve öğretmen örgütsel kimlik algısı ölçeği kullanılmıştır. Araştırma sonucuna göre, öğretmenlerin öğrenme merkezli liderlik ile örgütsel kimlik algıları yüksek düzeydedir. Öğretmenlerin öğrenme merkezli liderliğe ve örgütsel kimlik algılarına yönelik görüşlerinde cinsiyet, bulunduğu okulda çalışma süresi, okul müdürüyle çalışma süresi gibi değişkenler farklılık oluşturmamaktadır. Kıdem değişkeni öğretmenlerin öğrenme merkezli liderliğe yönelik görüşlerinde ölçek toplamı ile öğrenme desteği sağlama ve öğrenme programlarını yönetme ve model olma alt boyutlarında anlamlı fark oluştururken, örgütsel kimlik algılarında farklılık oluşturmamıştır. Öğrenme merkezli liderlik ile örgütsel kimlik arasında pozitif yönlü, orta düzeyli bir ilişki vardır.

Anahtar kelimeler: Öğrenme merkezli liderlik, örgütsel kimlik, öğretmen

To cite this article in APA Style:
Akgün, N. & Tabak, I. (2023). The relationship between school administrators' learning-centred leadership attitudes and teachers' organizational identity perceptions. *Bartın University Journal of Faculty of Education, 12*(1), 97-110. https://doi.org/10.14686/buefad.973911

INTRODUCTION

In the first quarter of the 21st century, change and competition conditions significantly affected the relationship between many variables that are effective in the success of organizations. Schools are the leading institutions that want to be successful and keep up with the changing conditions of the society. They are organizations that train people in line with the desires of the society. Given that the success of organizations is measured by the success of the leader heading the organization, many segments in society from policy makers to practitioners have accepted the importance of leadership (Zengin, 2019). This is because it is leaders' duty to set new goals for the people who are the source of change in organizations and to ensure that they adopt these goals and work effectively (Aydın Turan, 2019; Memişoğlu & Yılmaz, 2019). School leaders, namely school principals who are responsible for fulfilling many duties at schools, work for the effectiveness and success of the school (Aksoyalp, 2010; Gümüş, Bellibaş, Esen, & Gümüş, 2018). There is no doubt that school administrators have an important role to play in the educational activities of schools and to increase the quality of education in the school. Leadership characteristics of school administrators are of great importance in achieving the stated objectives (Akgün, Özdemir, Yıldız, Cerit, & Yılmaz, 2019; Ertürk, 2019a). School principals being solution-oriented, innovative, supportive, helpful, visionary and mission-oriented leaders contribute to the effectiveness of schools (Ertürk & Memişoğlu, 2018). Thus, the leadership of school principals becomes a very important factor at schools (Ertürk, 2019b).

Leaders who are defined as people having power and authority in management are people who have the required knowledge and experience to trigger a certain group of people for certain purposes. At schools, it requires knowledge and experience to organize all the partners of the school in terms of school's vision, mission and goals and to unite them around the goals (Akgün, et al., 2019; Eraslan, 2004; Özdemir & Sezgin, 2002). It is again the duty of the school leader to set new goals for teachers who are the source of change, and to ensure they adopt these goals and work effectively (Aydın Turan, 2019). Effective school principals focus both on teaching and learning at their schools. For them, students' learning is also important. Taking this into consideration, they coordinate the curriculum in line with the vision and goals of the school, and create strategies to develop teachers as well as students (Sun, Youngs, Yang, Chu & Zhao, 2012).

When the literature is reviewed, it is seen that there are many types of school leadership (Tan, 2014), and learning-centred leadership, which was initially seen as part of instructional leadership and which is also a leadership model that has become popular in recent years, and it has begun to be applied at schools, namely, educational organizations. As the instructional leadership focuses on the teacher's teaching skills and performance in the classroom, it is thought that learning takes a backseat to the idea that learning-centred leadership should be applied in schools (Gümüş et al., 2018). Liu, Hallinger, and Feng (2016) stated that learning-centred leadership differs from other leadership models in that it is based on instructional leadership and transformational leadership, and learning-centred leadership focuses on all employees' learning at school. While Marks and Printy (2003) on the other hand, emphasize the individual and organizational competencies of teachers (Marks & Printy, 2003), learning-centred leadership aims to develop the learning capacity of all employees at school (Liu et al., 2016). This situation shows that instructional leaders focus on the teaching aspect of teachers within the framework of the vision of the school while with learning-centred leadership, it is emphasized that total learning is important in the organization (Kılınç, Bellibaş & Gümüş, 2017). In learning-centred leadership, school administrators are expected both to be learners and to lead all the partners of the school by encouraging them to learn. Learning-centred leadership behaviours will contribute to the formation of organizational identity by supporting employees to get to know their institutions better and to identify themselves with the organization. Leadership behaviours which put learning in the centre are especially important in creating a school-specific identity. In some ways, we can say that a corporate identity suitable for the characteristics of the school is a product of learning-centred leadership behaviours.

Learning-centred leadership has two basic perspectives in literature. One of these perspectives belongs to Murphy et al. (2006). To them, learning-centred leadership is conceptualized with the combination of learning leadership and transformational leadership. Murphy et al. (2006) examined the dimensions of learning-centred leadership under 8 titles: developing vision for learning, teaching programme, training programme, assessment programme, learning community, acquisition and use of the sources, organizational culture and defence of rights. The second perspective, however, belongs to Liu, Hallinger and Feng (2016). They based learning-centred leadership on educational leadership and transformational leadership, and examined the learning-centred

leadership model in four dimensions: developing vision for learning, providing support for learning, managing the learning programme and setting a model (Kılınç, Bellibaş & Gümüş, 2017; Polat,2020).

Teachers who work at a school where their professional training is supported by the school administrator and where they are provided with such sources as time, money and training for their professional training can exhibit their potentials at a higher level. In addition, any teacher who feels the support of his/her school will do more than he is expected for the success of the school. Moreover, the communication between teachers develops and gets stronger at a school where the teachers working at a school are encouraged to learn from each other, and thus these teachers will share the projects that they will do with one another. While this situation supports the teachers' professional development, it also enhances their devotion and loyalty to the institution and thee profession.

Organizations where the individual spends much of his life affect the individual in every way. The individual, especially the identity of the individual, is an important factor affecting the organization. Identity is seen in two forms as individual identity and organizational identity. Individual identity begins to form in the early years of an individual's childhood and continues to develop throughout life (Kılıçkaya, 2019). Identity is a concept that allows a person to define and understand himself, and gives meaning to his existence (Arslan, 2019). Identity contains all the features that help the individual to be defined by others, and belonging and being an individual are accepted as the basic criteria in determining identity. The reason for this is that identity helps the person to be himself and to feel dependent on the organization (Dağ Yalnızlar, 2019). The identity of the individual affects the organization that he is in (Akgül, 2012). Understanding the concept of organizational identity first requires knowing the meaning of the concept of identity. The answers given to the questions "Who am I? or "Who are we?" enable the individual to express himself and the organization to define itself (Akgül, 2012; Dağ Yalnızlar, 2019; Erdinç, 2019; Kasap Çabanoğlu, 2008; Kılıçkaya, 2019; Taşdan, 2015; Taşdan, 2010). Organizational identity plays an important role in the survival of organizations, increasing their efficiency and productivity (Erdinç, 2019). Teachers' understanding of organizational identity is also considered very important at schools where efficiency and productivity are intended to be high, because organizational identity enables employees to identify themselves with the organization (Argon & Ertürk, 2013). A strong organizational identity unifies teachers with the school. It provides positive motivation for teachers. It enables qualified teachers to prefer that school. It builds trust in other partners of the school, especially in students. It increases the commitment and sense of belonging of teachers and all other employees to the organization (Filizöz & Koparan, 2016). The attitudes and behaviours of organizational leaders are effective in the formation of organizational identity in the integration of individuals with the organization, too (Ertürk, 2018a). Individuals with different identities work together at schools. Organizations, like individuals, have identities reflected in their behaviours, appearances and practices, and this is a feature that separates them from other organizations.

In their study, Bogler and Somech (2004) evaluated the teacher's identity as a higher-level concept than organizational identity. Thus, they examined the development of the teacher's identity in six variables: making a decision, professional development, status, self-efficiency, autonomy and effect. Christ, Van Dick, Wagner and Stellmacher (2003) explained the identity formation in 3 main variables, which are defining the career, team climate and organizational identity, and in 4 intervening variables which are emotional, cognitive, assessment and behaviour. Stating that teachers' organizational identity perceptions can develop with such organizational citizen behaviours as communication within the organization, sense of belonging to the organization, and sharing the values of the organization, Tabak and Boyacı (2019) explained the teachers' organizational identity perception in the sub-dimensions like support, belonging and communication in their study.

People have come together to form organizations to achieve certain goals, and over time this unity has led them to express themselves as a whole and with an identity. Such a corporate identity has provided the function of uniting the organization's employees with the organization and distinguishing the organization from its counterparts. This is similar at schools. Although the schools are similar in appearance, they can differ from each other in terms of teaching staff, student potential, and parent profile. These differences and the school's emblems, pennants, prominent subjects and reasons for preference constitute the identity of the schools. School principals also have great importance in the formation of the identity of schools. This is because the identity of the school is a leadership function and the school principal is the person who determines or leads the determination of the vision, mission and strategies of the school. School principals who show learning-centred leadership while contributing to the learning of the school as a whole also help the development of teachers' organizational identity. In this respect, learning-centred leadership can be an important predictor of organizational identity by creating an organizational culture that is effective on the unity of the school. Therefore, this research aims to determine the

relationship between teachers' views on learning-centred leadership and organizational identity. In line with this purpose, answers to the following questions were sought:

1. At which level are the teachers' perceptions on learning-centred leadership and organizational identity?

2. Do teachers' perceptions on learning-centred leadership and organizational identity differ significantly in terms of demographic information (gender, professional seniority, working time at school, working time with their principal)?

3. Is there a significant relationship between teachers' perceptions on learning-centred leadership and organizational identity?

METHOD

The research is in relational survey model. The relational survey model aims to determine the existence and/or degree of co-variance between two or more variables (Karasar, 2014).

Participants

The population of the research consists of 266 teachers who agreed to volunteer for the study out of 873 teachers working in secondary schools in the central district of the province of Bolu between 2020 and 2021. The demographic characteristics of the teachers in terms of the variables of gender, professional seniority, working time at school and working time with the principal are as follows: 50.8% of the teachers are female and 49.2% are male. In terms of professional seniority variable, 10.5% of teachers are between 0-5 years, 11.7% are between 6-10 years, 18.8% are between 11-15 years, 29.7% are between 16-20 years, 29.3% of them have 21 years or more professional seniority. In terms of the variable of working time at school, while 41% of teachers are working at their school for between 0-5 years, 24.8% are between 6-10 years, 18.4% are between 1-15 years, 15.8% are between 16 years and above. 26.7% of teachers work with the same school principal for less than 1 year, 41% for 1-4 years, and 32.3% for 5 years or more.

Data Collection Tools

Personal information form, learning-centred leadership and teachers' organizational identity perception scales were used as data collection tools in the study.

Personal information form: In this form, there are demographic variables such as gender, professional seniority, working time at the school and working time with the school principal.

Learning-Centred Leadership Scale (SCLS): Learning-centred leadership scale developed by Liu et al. (2016) was adapted to Turkish culture by Gümüş Kılınç et al. (2017). Internal consistency values of the items of the scale vary between .88 and .91. In this study, Cronbach Alpha coefficient of the scale was determined as .97 in the sum of the scale, as .94 in the sub-dimension of creating a vision for learning, as .94 in the sub-dimension of providing learning support and as .94 in the sub-dimension of managing the learning programme and being a model. The scale consists of three sub-dimensions: creating a vision for learning, providing learning support, managing the learning program and being a model and 19 items; 5 in creating a vision for learning, 7 in providing learning support, and 7 in managing the learning program and being a model. This shows that the scale has a high internal consistency. The scale is of a 5-likert type (between “I do not agree at all.” and “I agree totally.”)

Teachers’ organizational identity perception scale: The scale developed by Tabak and Boyacı (2019) and being of a 1-likert type (“not fit at all (1)”, “not fit (2)”, “partly fit (3)”, “fit (4)” and “totally fit (5)”) consists of 17 items and three sub-dimensions; support (8 items), belonging (4 items) and communication (5 items). The Cronbach Alpha parameter of the scale was .94 in total. It was calculated as .94 in the support dimension, .80 in the belonging dimension and .80 in the communication dimension. And in this study, the Cronbach Alpha parameter was .96 in total; It was calculated as .94 in the support sub-dimension, .81 in the belonging sub-dimension, and .94 in the communication sub-dimension. This situation shows that the scale is a reliable measuring tool.

Data Collection and Data Analysis

Population of this study consists of a total of 873 teacehers.. However, 480 of them have been accessed and 266 teachers have answered the scales, therefore these 266 teachers have been included in the study. Of the scales distributed to 480 people in the study universe of the research, 281 have returned. Of the returned scales, 15 scales have not been evaluated due to data loss, in 266 scales, the normality of the distribution of the data was examined

with the Kolmogorov-Smirov test and it was determined that the distribution was not normal (p<05). Accordingly, for the analysis of the data within the scope of sub-problems, percentage, frequency, arithmetic mean and standard deviations were calculated, and non-parametric tests (Mann Whitney U and Kruskal Wallis) and Sperman Rho Correlation analysis were used for the analysis of the variables.

FINDINGS

The findings of the analyses made within the scope of the problem statements of the research and the comments made on the findings are included in this part.

Findings and Comments on the First Sub-Problem

Table 1. Mean and Standard Deviation Values for Teachers' Perception of Learning-Centred Leadership and Organizational Identity

Scale	Sub Dimensions	n	X̄	ss
Learning-Centred Leadership	Developing a Vision for Learning	266	3,92	,787
	Providing Learning Support	266	3,59	,829
	Managing the Learning Program and Being a Model	266	3,69	,794
	Total	266	3,71	,765
Teachers' Perception about Organizational Identity	Support	266	3,95	,858
	Belonging	266	3,99	,798
	Communication	266	3,88	,892
	Total	266	3,94	,765

When Table 1 is examined, in the sub-dimensions of developing a vision about learning, teachers' views on learning-centred leadership (X̄=3.9248), providing learning support (X̄=3.5972) and managing the learning program and being a model (X̄=3.6960) and in total (X̄=3.7198) the scale is at the level of “I agree”; and their views on organizational identity perception were found to be at the "convenient" level in terms of support (X̄=3,9507), belonging (X̄=3.9972) and communication (X̄=3,8895) sub-dimensions and in total (X̄=3.9436). This finding shows that teachers' perceptions about both learning-centred leadership and organizational identity are high.

Findings and Comments on the Second Sub-Problem

Table 2. Mann Whitney-U Test Results for Teachers' Perception of Learning Centred Leadership and Organizational Identity by Gender Variable

Scale	Sub dimensions	Gender	N	Mean	Sum of the line	U	P
Learning Centred Leadership	Developing a Vision about Learning	Female	135	133,83	18067,0	8798,	,942
		Male	131	133,16	17444,0	000	
	Providing Learning Support	Female	135	136,37	18410,0	8455,	,536
		Male	131	1130,5	17101,0	000	
	Managing the Learning Program and Being a Model	Female	135	136,87	18478,0	8387,	,465
		Male	131	130,02	17033,0 0	000	
	Total	Female	135	135,70	18320,0	8545,	,635
		Male	131	131,23	17191,0	000	
Teachers' Perception of Organizational Identity	Support	Female	135	135,07	18234,5	8630,	,735
		Male	131	131,88	17276,5	500	
	Belonging	Female	135	134,66	18179,5	8685,	,801
		Male	131	132,30	17331,5	500	
	Communication	Female	135	132,81	17929,5	8749,	,882
		Male	131	134,21	17581,5	500	
	Total	Female	135	134,73	18189,0	8676,	,791
		Male	131	132,23	17322,0	000	

p<.05

When Table 2 is examined, it is determined that teachers' views about learning-centred leadership do not make any significant difference in terms of gender variable in the sub-dimensions of developing a vision for learning

(U=8798.000), providing learning support (U=8455,000), and managing the learning program and modelling (U=8387.000) and in the total of scale (U=8545,000). In terms of the gender variable, teachers' opinions about organizational identity perception do not make any significant difference in the sub-dimensions of support (U=8630,500), belonging (U=8685,500) and communication (U=8685,500) and in the total of the organizational identity scale (U=8676,000). It can be concluded, based on this finding, that the gender variable does not create a significant difference in teachers' views of learning-centred leadership and their perceptions of organizational identity.

Table 3. Kruskal Wallis-H Test Results About Learning Centred Leadership and Perception of Organizational Identity in terms of the Variable of Professional Seniority of Teachers

Scale	Sub-dimensions	Professional seniority	n	Rank Mean	sd	chi-square	p	Significant Difference
Learning Centred Leadership	Creating a Vision for Learning	(1)0-5 years	28	133,16	4	4,044	,400	-
		(2)6-10 years	31	112,97				
		(3)11-15 years	50	125,72				
		(4)16-20 years	79	140,75				
		(5)21 years or more	78	139,42				
	Providing Learning Support	(1)0-5 years	28	134,48	4	12,681	,013	2-4 2-5 3-4
		(2)6-10 years	31	98,48				
		(3)11-15 years	50	116,90				
		(4)16-20 years	79	144,63				
		(5)21 years or more	78	146,44				
	Managing Learning Programs and Becoming a Model	(1)0-5 years	28	139,29	4	11,490	0,22	2-4 2-5 3-4
		(2)6-10 years	31	102,87				
		(3)11-15 years	50	114,93				
		(4)16-20 years	79	147,29				
		(5)21 years or more	78	141,53				
	Total	(1)0-5 years	28	134,43	4	10,732	,030	2-4 2-5
		(2)6-10 years	31	100,21				
		(3)11-15 years	50	119,24				
		(4)16-20 years	79	145,15				
		(5)21 years or more	78	143,74				
Teachers' perception about organizational identity	Support	(1)0-5 years	28	135,00	4	3,127	,537	-
		(2)6-10 years	31	116,21				
		(3)11-15 years	50	136,27				
		(4)16-20 years	79	128,73				
		(5)21 years or more	78	142,89				
	Belonging	(1)0-5 years	28	142,93	4	3,734	,443	-
		(2)6-10 years	31	127,63				
		(3)11-15 years	50	136,63				
		(4)16-20 years	79	121,51				
		(5)21 years or more	78	142,58				
	Communication	(1)0-5 years	28	126,88	4	4,403	,354	-
		(2)6-10 years	31	1112,29				
		(3)11-15 years	50	144,29				
		(4)16-20 years	79	130,28				
		(5)21 years or more	78	140,65				
	Total	(1)0-5 years	28	132,41	4	3,923	,417	
		(2)6-10 years	31	116,40				
		(3)11-15 years	50	139,71				
		(4)16-20 years	79	126,49				
		(5)21 years or more	78	143,81				

p<.05

When Table 3 is examined, it has been determined that while the seniority variable created a significant difference in teachers' views about learning-centred leadership in terms of providing learning support (X^2= 12,681), managing the learning program and being a model (X^2=11.490) sub dimensions and learning-centred leadership scale (X^2=10.732) in total, there wasn't significant difference in the sub-dimension of creating a vision for learning (X^2=4,044). As a result of the Mann Whitney U tests conducted to determine between which groups

the detected difference was in the sub-dimension of providing learning support, between teachers with 6-10 years of seniority and 16-20 years of seniority, there is a significant difference in favour of teachers with a seniority of 16-20 years ($\bar{x}$=144,63); between teachers with a seniority of 6-10 years and teachers with a seniority of 21 years and more, there is a significant difference in favour of teachers with a seniority of 21 years and more ($\bar{x}$=146,44) and between teachers with 11-15 years of seniority and teachers with 16-20 years of seniority, a significant difference was found in favour of teachers with 16-20 years of seniority ($\bar{x}$=144,63). In the sub-dimension of managing the learning program and being a model; there is a significant difference between teachers with 6-10 years of seniority and teachers with 16-20 years of seniority, in favour of teachers with 16-20 years of seniority ($\bar{x}$=147,29); Between teachers with 6-10 years of seniority and teachers with 21 years and more seniority ($\bar{x}$=141,53) in favour of teachers with 21 years and more seniority, and teachers with 11-15 years of seniority and teachers with 16-20 years of seniority ($\bar{x}$=147,29) in favour of teachers with 16-20 years of seniority. Considering the learning-centred leadership scale in general, there is a significant difference between teachers with 6-10 years of seniority and teachers with 16-20 years of experience in favour of teachers with 16-20 years of seniority **(**$\bar{x}$=145,15), between teachers with 6-10 years of seniority and teachers with 21 years and more seniority in favour of teachers with 21 years and more seniority ($\bar{x}$=147,29). In other words, the professional seniority variable causes a significant difference in teachers' perceptions of learning-centred leadership, especially between teachers with 6-10 years of seniority and teachers with 16-20 years and 21 years and more, in favour of teachers with high professional seniority.

It has been determined that the teachers' views on the perception of organizational identity did not make a significant difference in the sub-dimensions of support (X^2=3, 127), belonging (X^2=3,734), communication (X^2=4.403) and in the total (X^2=3.923) in terms of professional seniority variable. In other words, it can be explained as the seniority variable does not cause a significant difference between teachers' opinions who have just started the job and teachers who are close to retirement, regarding their perceptions of organizational identity.

Table 4. Kruskal Wallis-H Test Results About Learning Centred Leadership and Perception of Organizational Identity In Terms Of the Variable of Teachers' Working Time at the School

Scale	Sub dimensions	Working time at school	n	Rank Mean	sd	chi-square	p	Significant difference
Learning Centred Leadership	Developing a Vision About Learning	(1)0-5 years	109	133,10	3	5,286	,152	-
		(2)6-10 years	66	129,73				
		(3)11-15 years	49	153,00				
		(4)16 years or more	42	117,71				
	Providing Learning Support	(1)0-5 years	109	131,46	3	4,645	,200	-
		(2)6-10 years	66	121,95				
		(3)11-15 years	49	152,68				
		(4)16 years or more	42	134,57				
	Managing Learning Programs and Being a Model	(1)0-5 years	109	134,63	3	6,395	,094	-
		(2)6-10 years	66	117,63				
		(3)11-15 years	49	153,98				
		(4)16 years or more	42	131, 61				
	Total	(1)0-5 years	109	132,68	3	5,180	,159	-
		(2)6-10 years	66	121,87				
		(3)11-15 years	49	154,21				
		(4)16 years or more	42	129,73				
Teachers' Perception About Organizational Identity	Support	(1)0-5 years	109	135,48	3	5,626	,131	-
		(2)6-10 years	66	131,43				
		(3)11-15 years	49	150,07				
		(4)16 years or more	42	112,27				
	Belonging	(1)0-5 years	109	142,72	3	5,395	,145	-
		(2)6-10 years	66	117,86				
		(3)11-15 years	49	141,39				
		(4)16 years or more	42	124,93				
	Communication	(1)0-5 years	109	135,57	3	6,080	,108	-
		(2)6-10 years	66	133,33				
		(3)11-15 years	49	149,21				
		(4)16 years or more	42	110,07				
	Total	(1)0-5 years	109	136,95	3	6,188	,103	-
		(2)6-10 years	66	128,84				
		(3)11-15 years	49	150,59				
		(4)16 years or more	42	111,93				

p<.05

By looking at Table 4, working time at the school variable did not make a significant difference in creating a vision for learning about teachers' views on learning-centred leadership (X^2= 5.286), providing learning support (X^2=4.645), and managing the learning program and being a model (X2=6.395) and in the total scale (X^2=5,180). When the teachers' views about organizational identity were examined about the variable of working time at school, in the sub-dimensions of support (X^2=5.626), belonging (X^2=5.395), communication (X^2=6.080) and the scale total (X^2=6.188) there was not a significant difference in teachers' views. This finding shows that the duration of working at school does not create a significant difference in teachers' views on learning-centred leadership and their perceptions of organizational identity.

Table 5. Kruskal Wallis-H Test Results About Learning Centred Leadership and Perception of Organizational Identity In Terms Of the Variable of Teachers' Working Time with the School Principal

Scale	Sub dimensions	Working time with the school principal	n	Rank mean	sd	Chi square	p	Significant difference
Learning Centred Leadership	Creating a Vision for Learning	Less than 1 year	71	133,13	2	2,409	,300	-
		1-4 years	10	126,19				
		5 years and more	86	143,06				
	Providing Learning Support	Less than 1 year	71	133,48	2	4,919	,085	-
		1-4 years	10	126,19				
		5 years and more	86	147,23				
	Managing Learning Programs and Being a Model	Less than 1 year	71	132,27	2	3,509	,173	-
		1-4 years	10	124,86				
		5 years and more	86	145,47				
	Total	Less than 1 year	71	133,45	2	4,146	,126	-
		1-4 years	10	123,56				
		5 years and more	86	146,14				
Teachers' Perception of Organizational Identity	Support	Less than 1 year	71	134,42	2	5,961	,051	-
		1-4 years	10	125,18				
		5 years and more	86	136,65				
	Belonging	Less than 1 year	71	133,55	2	0,459	,795	-
		1-4 years	10	123,71				
		5 years and more	86	139,27				
	Belonging	Less than 1 year	71	133,21	2	3,605	,165	-
		1-4 years	10	123,69				
		5 years and more	86	139,53				
	Total	Less than 1 year	71	133,92	2	4,019	,134	-
		1-4 years	10	123,65				
		5 years and more	86	139,09				

p<.05

In When Table 5 is examined, it is determined that there was not a significant difference about the working time with the school principal in creating a vision for the sub-dimensions of learning (X^2=2,409), providing learning support (X^2=4,919) and managing the learning program and being a model (X^2=3,509) and in total (X^2=4.146). No significant difference was determined between the teachers' views about the perception of organizational identity in the sub-dimensions of support (X^2=5.961), belonging (X^2= .459) and communication (X^2=3.605) and in total (X^2= 4.019). Depending on these findings, it could be said that the variable of working time with the school principal creates a similarity in teachers' views about learning-centred leadership and their perceptions of organizational identity, and that it does not create a significant difference in them.

Findings and comments on the Third Sub-Problem

Table 6. Correlation Analysis Table of Teachers' Views about Learning-Centred Leadership and Perception of Organizational Identity

Dimensions		Developing a Vision for Learning	Providing Learning Support	Managing the Learning Program and Being a Model	Learning Centred Leadership
Support	r	,714**	,654**	,613**	,696**
	P	,000	,000	,000	,000
	N	266	266	266	266
Belonging	r	,535**	,463**	,490**	,521**
	P	,000	,000	,000	,000
	N	266	266	266	266
Communication	r	,569**	,516**	,472**	,538**
	p	,000	,000	,000	,000
	N	266	266	266	266
Teachers'	r	,709**	,641**	,609**	,684**
Perceptionof	P	,000	,000	,000	,000
Organizational	N	266	266	266	266
Identity					

* p<.05** p<.01

When Table 6 is examined, a significant, positive and moderate relationship was found between teachers' views on learning-centred leadership and organizational identity (r=,684; p=,000). It is determined that the relations between the scales and their sub-dimensions were generally significant, positive and moderate. The highest level of relationship was found to be among the sub-dimensions of supporting and developing vision for learning (r=,714; p=,000), and the lowest relationship was between the sub-dimensions of belonging and providing learning support (r=,463; p=,000). Depending on his finding, it could be said that not only do teachers' perceptions of learning-centred leadership increase positively but also their perceptions of organizational identity strengthen in a positive way.

DISCUSSION & CONCLUSION

Due to the results of the research, teachers' views on learning-centred leadership and its sub-dimensions and organizational identity and sub-dimensions are at a high level. According to this result, school principals develop a common vision for everyone working and present at the school where the teachers work, they provide resources such as time, money, training opportunities to support teachers in all their professional development at school, they guide teachers by showing superior performance in professional learning and appreciate the work done at school. There is a positive communication environment at the school where they work and they show extra efforts for their school to become successful.

Learning-centred leadership aims to improve the organizational learning capacity of the school (Liu, et al. 2016). School administrators should consider teachers as individuals who learn as a team rather than individuals who teach, and they should ensure that this team focuses all their efforts on students' learning (Kılınç et al., 2017). This will be possible when school administrators can fulfil their learning-centred leadership roles. In this respect, teachers' learning-centred leadership perceptions being at a high level in this study will contribute to teachers' being learning individuals.

As a result of the strengthening of organizational identity, organizational commitment will also become powerful employees with strong organizational identity perception will display organizational citizenship behaviours more. The perception of organizational identity is specific to that institution and cannot be transferred. Therefore, individuals with a strong sense of organizational identity develop a stronger sense of belonging to their institutions than organizational commitment. Thus, organizational commitment and citizenship behaviour emerge as a natural result of a strong perception of organizational identity (Atakan-Duman, Paşamehmetoğlu, & Poyraz, 2013). In this sense, it is a very important result that teachers who have important duties and responsibilities on the success of schools, have a high level of organizational identity perception. Because as a teacher with a high perception of organizational identity will develop the sense of belonging to the school of the teacher develops, his level of emotional commitment will increase, and therefore, his organizational citizenship behaviour will increase by performing the duties and responsibilities in the best manner for the success of the school and by struggling

more apart from his official duties (Ertürk, 2018b). As a matter of fact, Akdemir and Duman (2016) stated that employees who see themselves as a member of the family in the organization complete their tasks on time, make an effort to reach the goals, have a high sense of responsibility at work and achieve success.

When the literature is examined, the result of this research on learning-centred leadership corresponds with the result of Polat's (2018) study. While the results of the studies conducted by Erdinç (2019), Arslan (2018) and Ertürk (2018a) on organizational identity are similar to the results reached in this research, in the studies conducted by Yaykıran (2020), Taşdan (2015), Argon and Ertürk (2013), it was concluded that teachers' organizational identity perceptions are at the level of "frequently". The fact that the study was conducted on teachers working in different regions may have caused the results to be different.

In the research, it was concluded that there was no difference between the teachers' views about learning-centred leadership and organizational identity according to variables such as gender, working time at the school and working time with the school principal. In his study, Polat (2020) concluded that the variables of gender and working time at school did not make a difference in teacher perceptions of learning-centred leadership, which supports the result of this research. Although there are studies in the literature (Yaykıran, 2020; Kılıçkaya, 2019; Erdinç, 2019; Arslan, 2018), which concluded that the gender variable does not create a difference in teachers' perceptions of organizational identity, supporting the result of this research, it is seen that some studies (Ertürk, 2018a; Taşdan, 2015; Ertürk et al. Argon, 2013) have reached different results. In some studies on teachers' views on organizational identity perception (Erdinç, 2019; Arslan, 2018), similar to the result reached in this research, while it was concluded that the variable of working time at school did not make a difference about teachers' perceptions of organizational identity, in the study of Yaykıran (2020), it was concluded that working time at school makes a significant difference on the perception of organizational identity.

There is a significant difference in the sub-dimensions of providing learning support, managing the learning program and being a model in the total of the learning-centred leadership scale of teachers from different seniorities. However, there was no difference in the views of teachers with different years of seniority in the sub-dimension of learning-centred leadership for developing a vision for learning and in their views of organizational identity. The significant difference detected in the sub-dimension of providing learning support was between teachers with 6-10 years of seniority and teachers with 16-20 years of seniority, in favour of teachers with 16-20 years of seniority, between teachers with 6-10 years of seniority and teachers with 21 years or more of seniority, in favour of teachers of 21 years or more seniority, and between teachers with 11-15 years of seniority and teachers with 16-20 years of seniority, it was in favour of teachers with 16-20 years of seniority; in the sub-dimension of managing the learning program and being a model, between teachers with 6-10 years of seniority and teachers with 16-20 years of seniority, in favour of teachers with 16-20 years of seniority; Between teachers with 6-10 years of seniority and teachers with 21 years and more seniority, in favour of teachers with 21 years and more seniority, between the teachers with 11-15 years of seniority and the teachers with 16-20 years of seniority, there is a difference in favour of teachers with 16-20 years of seniority. The difference in the learning-centred leadership scale between teachers with 6-10 years of seniority and teachers with 16-20 years of seniority, in favour of teachers with 16-20 years of seniority; It is in favour of teachers with a seniority of 21 years and above between teachers with a seniority of 6-10 years and teachers with a seniority of 21 years and above. These findings show that as the seniority of the teachers increases their views of learning-centred leadership also increase. Teachers who have just started their profession think that school principals do not support them in terms of providing opportunities for their professional development. On the other hand, teachers with high seniority think that their school principals support them. When the literature was examined, Polat (2020) concluded that seniority variable did not make a difference in the views of teachers on learning-centred leadership. Besides the studies in the literature about teachers' views on organizational identity and supporting the result of this research (Kılıçkaya, 2019; Yaykıran, 2020 and Arslan, 2018), there are studies that have reached different results (Yılmaz, Turgut, & Yavuz, 2016; Erdinç, 2019; Taşdan, 2015; Argon and Ertürk, 2013; Ertürk, 2018a).

There is a significant, positive and moderate relationship between teachers' views on learning-centred leadership and organizational identity. The relationships between the scales and their sub-dimensions are also significant, moderate and positive. It was concluded that the highest level of relationship was between support and creating a learning vision sub-dimensions, and the lowest relationship was between belonging and learning support sub-dimensions. Increasing learning-centred leadership behaviours will strengthen organizational identity. Apart from this, teachers' feeling that they are supported by the school principal and friends can contribute more to the common vision of the school. In learning-centred leadership, the school principal not only contributes actively to

in-school learning practices, but also contributes to the creation of a school environment that enables teachers to develop their professional learning processes and learn interactively with their colleagues (Kılınç et al., 2017). The attitudes and behaviours of the administrators as school leaders are effective in the formation of organizational identity perceptions of teachers by unifying them with the school (Ertürk, 2018a). Therefore, the emergence of positive relations between learning-centred leadership and organizational identity can be seen as a usual situation. When the literature is examined, Polat (2020) concluded that there are positive and moderately significant relationships between teacher professionalism and learning-centred leadership, and Bakan, Doğan, Koçdemir and Oğuz (2018) concluded that learned powerfulness has a positive effect on learning-centred leadership. It is determined that teachers' perception of organizational identity is related to organizational commitment (Kılıçkaya, 2019), organizational health (Erdinç, 2019), organizational commitment and organizational citizenship (Atakan-Duman et al., 2013), identification (Yaykıran, 2020), inner motivation (Argon & Ertürk, 2013) and justice (Ertürk, 2018a).

This study shows that there is a relationship between the school principals' learning-centred leadership attitudes and their perceptions of organizational identity. As the school principals' learning-centred attitudes increase, their perceptions of organizational identity will also increase. As this result will enhance the teacher's performance at school, s/he is sure to achieve the desired success there.

In line with these results obtained from the study, the following recommendations have been developed:

• Teachers' perceptions can be increased at a very high level by enabling school principals to display learning-centred leadership behaviours. Experiences can be increased in the dimensions of support, belonging and communication which will strengthen teachers' perceptions of organizational identity.

• The reason for teachers' with little professional seniority having lower views about learning- centred leadership can be researched by qualitative studies

• During the research, it was seen that there are very few studies on learning-centred leadership in our country, so the studies on this subject can be increased

Further studies can be conducted at different levels of schools for the learning-centred leadership.

Statements of publication ethics

Bolu İzzet Baysal University Ethics Committee date meeting number and number: 01.03.2021 2021/02 (Protocol no: 2021/73):

Researchers' contribution rate

Authors contributed to the paper equally.

Conflict of interest

There is no conflict of interest.

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Bartın University Journal of Faculty of Education BUEFAD

2023, Volume 12, Issue 1, 111-123
dergipark.org.tr/buefad
DOI: 10.14686/buefad.1003378

Adolescents' Parents' Metaphorical Perceptions Toward Adolescents

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Research Article
Received: 02.10.2021
Revised: 09.05.2022
Accepted: 23.06.2022

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ABSTRACT

This study examined the metaphorical perceptions of parents with adolescent children towards adolescents and being the parent of an adolescent. The qualitative study participants consisted of 102 parents whose children were at the 8-12 grade level in Ankara. The data were collected in the spring term of the 2019-2020 academic year. The parents were asked to fill in the blanks: "I think today's adolescents are like ... because ……" and "Being the parent of an adolescent is like … because ……...". The themes that described adolescents involved egocentrism, sense of self and identity, storm and stress view, autonomy seek, and the effects of technology. The themes associated with being the parent of an adolescent included patience, parents as a guide/supervisor, and negative affectivity. The findings were discussed in light of different views in the relevant literature.

Keywords: Adolescent, parents with adolescent children, metaphor

Ergenlik Döneminde Çocuğu Olan Anababaların Ergenlere ve Ergen Anababası Olmaya Yönelik Metaforik Algıları

ÖZ

Bu çalışmanın amacı ergenlik döneminde çocuğu olan anababaların ergenlere ve ergen anababası olmaya ilişkin metaforik algılarını incelemektir. Çalışmada nitel araştırma yöntemi kullanılmıştır. Çalışmanın araştırma grubu Ankara'da ikamet eden, çocukları 8-12. Sınıfa devam eden 102 anababadan oluşmaktadır. Araştırma verileri 2019-2020 yılı bahar döneminde toplanmıştır. Araştırmada anababalara "Günümüz ergenleri bana göre ... gibidir çünkü ……" ve "Ergen anababası olmak … gibidir çünkü……." ifadeleri verilerek boş bırakılan yerleri tamamlamaları istenmiştir. Ergenleri tanımlamaya yönelik benmerkezcilik, benlik anlayışı ve kimlik, fırtına ve stres görüşü, özerklik arayışı, teknolojinin etkisi temaları, ergen anne/babası olmaya yönelik sabır taşı, rehber/yönetici olarak anababa, olumsuz duygulanım temaları öne çıkmıştır.

Anahtar kelimeler: Ergen, ergen anababası, ergenlik, metafor

To cite this article in APA Style:
Çetin Gündüz, H. & Tarhan, S. (2023). adolescents' parents' metaphorical perceptions toward adolescents. *Bartın University Journal of Faculty of Education, 12*(1), 111-123. https://doi.org/10.14686/buefad.1003378

INTRODUCTION

The oldest debate on adolescence concerns whether adolescence is a stressful period (Steinberg, 2007). Socrates described adolescents as inclined to "contradict their parents" and "tyrannize their teachers." In the 18th century, Jean-Jacques Rosseau proposed a more intellectual perspective of adolescence, stressing that being a child or adolescent is different from being an adult, and described adolescence using the stormy metaphor (Rousseau, 1962; Santrock, 2012).

According to Hall, adolescence is a period of storm and stress, and adolescents experience emotional conflicts and mood disruptions (Dolgin, 2014). Psychoanalytic theorists suggest that adolescent storms and stress stem from oedipal conflicts of early childhood (Erikson, 1968; Freud, 1958). When adolescents are defined with the stereotypes as lazy, egocentric and having everything easily, they are considered as displaying destructive and conflictual behaviors. (Santrock, 2012). The essence of adolescent storm and stress is the idea that adolescence is a troubled period of life (Buchanan et al., 1990). It results from growing stress triggered by many simultaneous changes, such as physical maturation, sense of autonomy, socialization, peer interactions, and brain development (Spear, 2000).

Adolescence is considered a challenging period for adolescents as well as for the people around them. It can be suggested that adolescence is a troubled period in three aspects (Arnett, 1999). The first aspect refers to conflict with parents. Adolescents tend to be rebellious and resist adult authority. Secondly, adolescents tend to have mood disruptions and be more emotionally volatile than children and adults. Finally, adolescents are more likely to demonstrate recklessness, non-normative, and antisocial behaviors and have the potential to hurt themselves and those around them than children and adults. According to Holmbeck and Hill (1988), scholars studying the adolescent storm and stress view generally focused on the conflicts between parents and adolescents.

Many systematic studies in the late 1970s began to question this unfavorable view of adolescence. The studies conducted on both typical and troubled adolescents proved that many assumptions and stereotypes about adolescence were incorrect (Steinberg, 2020, Santrock, 2012). Hall's (1904) view of adolescent storm and stress was reconsidered, and its universal and inevitable nature was rejected (Steinberg, 2007).

Positive youth development is a field that approaches adolescence from a positive perspective. The approach appreciates adolescents' observable potentials rather than focusing on their problems, conflicts, and failures (Damon, 2004). Recent studies have shown that although adolescents are exposed to rapid developmental changes, they generally adopt a positive lifestyle than a negative one (Berk, 2009). Lerner (2007) challenges the societal consensus of "inevitably troubled adolescents" and suggests that "most adolescents have an undeserved bad reputation" (Jackson-McLain, 2010). Anthropologist Mead (1928) opposed the view that adolescent storm and stress are universal and biological tendencies. Mead provided examples of more peaceful adolescence in non-Western cultures.

One of the critical contexts for adolescence is the family and home environment. As the fundamental context for physical and psychological growth, the family is the basic unit of society in which children engage in social life (Schaffer, 1997). System theorists underline the network of interconnected relationships in a family system and state that family members mutually influence each other (Berk, 2006). Parental behaviors influence adolescent behaviors and vice versa (Santrock, 2012).

The parent-adolescent relationship during adolescence is similar to a partnership in which the senior (parent) is much more experienced and willing to take over the responsibility for the care of the less senior (adolescent) in life (Steinberg, 2020). Adolescents' questioning behaviors are signs of cognitive development, but parents may perceive them as rebellious, conflictual, and norm-breaking behaviors (Santrock, 2012). Despite individual autonomy efforts, adolescents also need the support and trust of their families (Kulaksızoğlu, 2000; Yavuzer, 2005). An optimal parental support and control level is necessary for a healthy relationship between adolescents and parents (Noller, 1994). During adolescence, intimacy and power relations between adolescents and parents are reorganized and evolve towards an equal sharing with age (Akün, 2013). It is likely to establish positive relationships with parents as well as negative ones (Karataş et al., 2016).

Adolescence is characterized by turbulent times, negative moods, and problematic parental relationships (Op de Beeck, 2009). There are many sources of stress in adolescents' lives, such as puberty, academic performance and homework expectations, domestic violence, death, love relationships, relationships with peers and teachers, and bullying at school (Simuforosa, 2013). In addition to the mentioned stress factors experienced

by adolescents, parents see adolescence as a challenging period, perceive adolescent behaviors as problematic and conflict with adolescents, which might risk positive adolescent development.

Although the number of studies examining the adolescent-parent relationship is high in Turkey, they have primarily focused on adolescent attitudes and habits and the developmental effects of parenting styles and parental attitudes on adolescents (Bayraktar, 2007; Totan and Yöndem, 2007; Hamarta et al., 2010; Sezer, 2010; Özyürek and Nehir, 2021). Some studies determined adolescents' perceptions of their parents (Karataş et al., 2016). However, no study has examined the parents' perceptions towards adolescence and being a parent of adolescents. In this sense, it would be beneficial to see the projections of adolescence debates on parents' daily life.

This study aimed to investigate parents' perceptions towards today's adolescents and to be a parent of an adolescent by using metaphorical expressions. Therefore, answers to the following questions were sought:

- What are the metaphorical perceptions of parents with adolescent children towards today's adolescents?
- What are the metaphors that parents with adolescent children create about being a parent of an adolescent?
- Which categories can be created for the parents' metaphors about today's adolescents and being parents of an adolescent?

METHOD

Method section may include research design, the study group or participants of the study, data collection tools, data analysis.

Research Design

The metaphors were used to determine the participants' perceptions of adolescents and being parents of adolescents. The study employed a phenomenology design, one of the qualitative research methods, and the data were analyzed using content analysis techniques. Phenomenology design focuses on daily phenomena we are familiar with but do not have in-depth and detailed information or opinion. In phenomenology designs, data sources are the individuals or groups who experience and express the phenomenon (Yıldırım & Şimşek, 2011), and the subjective nature of participant experiences matters (Harper, 2012).

Study Group

The study group consisted of 102 parents with adolescent children between the ages of 9-18 in Ankara. An accessible sampling method was used to determine the participants. The participants' responses were examined, and the expressions that did not have a metaphorical sense or were left blank were excluded from the analysis. At the end of the assessment, we obtained 80 metaphors for today's adolescents and 89 metaphors for being the parent of an adolescent.

The parents' age ranged from 31 to 55. In the data set, 63 (78.8%) mothers and 17 (21.3%) fathers produced metaphors for today's adolescents, and 68 (76.4%) mothers and 21 (21.6%) fathers produced metaphors for being the parent of an adolescent theme. The education status of the participant parents that produced metaphors for "today's adolescents" and "being the parent of an adolescent" themes was as follows: primary school (7.5% and 6.7%), secondary school (6.3% and 5.6%), and high school (20% and %). 15), associate degree (12.5% and 10%), undergraduate (41.3% and 40%) and postgraduate (12.5% and 13%). The number of participants' children ranged from 1 to 4.

Data Collection

The school counselors working in secondary education institutions collected the data. They were informed about the purpose and content of the research and asked to send the data collection tool to the parents. The survey was on voluntary participation, and a consent form was obtained from the parents before the study. After the demographic information form, parents were asked to complete this statement: "I think, today's adolescents are like ... because ……" and "Being the parent of an adolescent is like … because …….".

Data Analysis

The data were analyzed in four steps: coding, classification, organizing the codes and themes, and interpreting the findings (Yıldırım & Şimşek, 2006). Firstly, irrelevant metaphors, false analogies, and expressions that were not logically associated with the themes were excluded from the analysis. Examples of excluded expressions are given below.

- I think today's adolescents are a little mature because we live in the age of science.

• Being the parent of an adolescent cannot be described but only experienced because it is impossible to make sense of their reactions and requests.

After removing irrelevant metaphors, the researchers reviewed others and numbered the forms. In coding the metaphors, the F code was used for fathers, the M code was used for mothers, and a sequence number was added to each parent code. Two researchers did the coding separately according to their implications, such as negative, positive, and neutral. The metaphorical expressions were categorized as positive, negative, or neutral according to their meanings in the explanation parts. The meaning in which the parents used the word was evaluated along with the word's plain meaning, and an explanation of a positive metaphor was expected to be positive. For example, the expression "Love is like a moth, and it demands attention" was considered positive, while "Love is like a planet, it has many different worlds" was considered neutral as it did not have a positive or negative meaning.

Then, the explanations regarding the metaphors were examined, and the themes that best explained the pattern were determined. A coding framework proposed by Strauss and Corbin (1990) was followed in the process (Yıldırım and Şimşek, 2006). The coding framework was created considering the characteristics of adolescence (e.g., self-seek, adolescent storm and stress, egocentrism), and subsequent characteristics (e.g., energetic and unpredictable nature of adolescents) were added to the coding. In such a coding process, categories or themes can be determined in advance, and new ones can be added to the procedure.

Two researchers reviewed the categories to ensure that the responses were related to the given categories. Miles and Huberman's (1994) reliability formula "Reliability= consensus/consensus + disagreement x 100" was also used. It was calculated as 93% for the "today's adolescents" theme, in which the number of metaphors that the two researchers agreed on was 74, and the number of conflicting metaphors was 6. Six conflicted metaphors were recorded following a literature review and feedback from two experts. For the theme of "being the parent of an adolescent," the consensus was reached in 77 except for the 12 metaphors. The reliability coefficient was 87%.

Validity is an essential component of reliability. Besides, the presentation of the data collection process and methods are of significance for validity (Yıldırım & Şimşek, 2006). According to Miles and Huberman (1994), data collection, analysis, and interpretation procedures should be consistent, and it is also essential to explain how this consistency is achieved. The analysis and interpretation processes are compatible with the previous conceptual frameworks. In this sense, the current study is valid and reliable as it meets all the requirements of a scientific study.

Research Ethics

Parents voluntarily participated in the study. The authors followed the principles of research ethics in the planning, data collection, data analysis, and findings phases of the current research.

FINDINGS

This section involves the findings related to the parents' metaphors and themes about "today's adolescents" and "being the parent of an adolescent."

Parents' Metaphors For "Today's Adolescents" and "Being The Parent of An Adolescent."

Parents created 80 metaphors for "today's adolescents" and "being the parent of an adolescent" themes. Table 1 shows the frequency and percentage distributions of the metaphors related to "today's adolescents," and Table 2 presents the metaphors of "being the parents of an adolescent" below.

Table 1. Frequency and Percentage Distribution of Metaphors Related to "Today's Adolescents"

Item No	Metaphor	f	%	Item No	Metaphor	f	%	Item No	Metaphor	f	%
1	Bomb/A powder barrel ready to explode A ticking time bomb	3	3.8	25	Egypt	1	1.3	49	Volcanic eruption	1	1.3
2	Heavy, rough sea/sea wave	3	3.8	26	Peacock	1	1.3	50	Grinder	1	1.3
3	Closed box	2	2.5	27	Three-wheeled car	1	1.3	51	Ice sculpture	1	1.3
4	Child	2	2.5	28	Hillside	1	1.3	52	Sun	1	1.3

Table 1 (continued)

5	Jackanapes/spoiled child	2	2.5	29	Crab	1	1.3	53	Greedy	1	1.3
6	Robot	2	2.5	30	Top model car	1	1.3	54	Prison inmate	1	1.3
7	Horse	1	1.3	31	Stubborn goat	1	1.3	55	Confused duck/goofy	1	1.3
8	Uncontrolled flowing water	1	1.3	32	Blind	1	1.3	56	Technology addicted	1	1.3
9	Demanding manager	1	1.3	33	Hour	1	1.3	57	Flood	1	1.3
10	Capitalism	1	1.3	34	Cheetah	1	1.3	58	Dictator	1	1.3
11	Crazy	1	1.3	35	Inexperienced fish	1	1.3	59	Priggish	1	1.3
12	Cactus	1	1.3	36	Garfield	1	1.3	60	A different planet	1	1.3
13	Electricity	1	1.3	37	Fragile and pitiless	1	1.3	61	Donkey	1	1.3
14	Fish in the jar	1	1.3	38	Madcap	1	1.3	62	The art of exaggeration	1	1.3
15	Broken clock	1	1.3	39	Evolution theory	1	1.3	63	Rose thorn	1	1.3
16	Flower blossom	1	1.3	40	Tsunami	1	1.3	64	Tortoise	1	1.3
17	Recklessness	1	1.3	41	Virtual game	1	1.3	65	Ice floe	1	1.3
18	WIFI devices	1	1.3	42	Impatient	1	1.3	66	Rough stream	1	1.3
19	Asocial	1	1.3	43	Water wave	1	1.3	67	Coffee foam	1	1.3
20	Smartphone	1	1.3	44	Dairy philosopher	1	1.3	68	Ship without a compass	1	1.3
21	Ungrateful cat	1	1.3	45	Dependent	1	1.3	69	Cloud on a lofty mountain	1	1.3
22	Tourist	1	1.3	46	Kite	1	1.3	70	Actias Luna/Moth	1	1.3
23	Divan poetry	1	1.3	47	Movie frame	1	1.3	71	Iron	1	1.3
24	The man who saved the world	1	1.3	48	Chatty	1	1.3	72	Platonic lover	1	1.3
	Total									80	100

As seen in Table 1, parents created 72 different -totally 80- metaphors to describe today's adolescents. The most frequently used metaphors are bomb/a powder barrel ready to explode/a ticking time bomb (3.8%), rough/heavy sea (3.8%), closed box (2.5%), child (2.5%), jackanapes/spoiled child (2.5%) and robot (2.5%).

Table 2. Frequency and Percentage Distribution of Metaphors Related to "Being the Parent of an Adolescent"

Item No	Metaphor	f	%	Item No	Metaphor	f	%	Item No	Metaphor	f	%
1	Be patience itself	15	18.8	26	As timid as a mouse	1	1.3	50	Saint	1	1.3
2	Chameleon	2	2.5	27	Expertise	1	1.3	51	Conductor	1	1.3
3	A ticking time bomb/Bomb	2	2.5	28	Blowing on cold water	1	1.3	52	Rock	1	1.3
4	Football match	2	2.5	29	Monkey	1	1.3	53	Surprise box	1	1.3
8	Big test	1	1.3	30	Earthquake victims	1	1.3	54	Bunch of grapes	1	1.3
6	Deaf and dumb	1	1.3	31	Play ostrich	1	1.3	55	Rescue team	1	1.3
7	TV audience	1	1.3	32	Neurotic	1	1.3	56	Tightrope walker	1	1.3
8	Eternal payment plan	1	1.3	33	Frontline friend	1	1.3	57	Cooking on a high heat	1	1.3
9	Parsley	1	1.3	34	Psychological counselor	1	1.3	58	Carry the world on your shoulder	1	1.3

Table 2 (continued)

10	Cotton to harvest	1		1.3	35	Climbing a mountain	1	1.3	59	Radar	1	1.3
11	Tabasco pepper	1		1.3	36	Referee	1	1.3	60	Gardener	1	1.3
12	Trauma	1		1.3	37	A field full of mines	1	1.3	61	Gnawing a stone	1	1.3
13	Adventure	1		1.3	38	Fruit	1	1.3	62	Detective	1	1.3
14	Difficult and Lengthy Process	1		1.3	39	Sandbag	1	1.3	63	Driving in snow	1	1.3
15	Melting candle	1		1.3	40	Trapped in a maze	1	1.3	64	Computer game	1	1.3
16	Puppet	1		1.3	41	Marathon run	1	1.3	65	Guitar spring	1	1.3
17	Stress ball	1		1.3	42	Spoon to stir milk	1	1.3	66	Tumbler/roly-poly	1	1.3
18	Panic attack	1		1.3	43	Matryoshka doll	1	1.3	67	Life coach	1	1.3
19	Adolescent	1		1.3	44	A Tough sport	1	1.3	68	Student	1	1.3
20	Spring	1		1.3	45	Referee	1	1.3	69	Unknown path	1	1.3
21	Privileged	1		1.3	46	A field full of mines	1	1.3	70	Making a snowman in the sun	1	1.3
22	Dungeon	1		1.3	47	A tough sport	1	1.3	71	Planetree	1	1.3
23	Playing with fire	1		1.3	48	A bottomless well	1	1.3	72	Migraine	1	1.3
24	Sun		1	1.3	49	Heavy, rough sea	1	1.3	73	Heroic commander	1	1.3
25	Raising a goat	1		1.3								
	Total										89	100

As seen in Table 2, parents used 73 different -and a total of 89- metaphors about being the parent of an adolescent. The most frequently used metaphors are being patience itself (18.8%), chameleon (2.5%), bomb/a ticking time bomb (2.5%), and football match (2.5%).

Semantic Reviews of Metaphors

Parents created 72 different metaphors for today's adolescents and 73 metaphors for being the parent of an adolescent. The metaphors were categorized semantically, considering their explanations. Of the metaphors for today's adolescents, 5 (6.3%) were positive, 66 (82.5%) were negative, and 9 (11.3%) were neutral. Of the metaphors for being the parent of an adolescent, 12 (15%) metaphors were positive, 41 (46.1%) were negative, and 36 (40.4%) were neutral. Examples of positive metaphors are as follows:

"Today's adolescents are like moths flying around the light because they fly there wherever they find light, love, and attention (M4)."

“Being the parent of an adolescent is like a sun because its heat and brightness expands an adolescent's world and makes them stronger (F31)."

Examples of negative metaphors are as follows:

“I think today's adolescents are like stubborn goats because they never listen to you; they only follow their noses by laughing in your face (M33)."

“Being the parent of an adolescent is like patience itself because their demands, moodiness, and stubbornness can barely be tolerated (F32)."

Examples of neutral metaphors are as follows:

“I think today's adolescents are like different planets because they have a very distinctive world. (M69).”

It can be seen that the negative metaphors (n=57) about today's adolescents are generally concerned with the unstable mood states and conflictual behaviors of adolescents. The number of positive metaphors was low (n= 6), and the number of neutral metaphors was 17. The metaphors used for being the parent of an adolescent

predominantly consisted of negative and neutral metaphors. The negative metaphors mainly emphasized the challenging aspects of adolescence.

Conceptual Themes

The metaphors created by parents for today's adolescents were grouped under 11 themes. The frequency and percentage distributions are shown in Table 3 below.

Table 3. Frequency and Percentage Distributions of Conceptual Categories Related to Today's Adolescents

Item No	Conceptual Themes	Metaphors	f	%
1	Egocentrism	Grinder, demanding manager, the man who saved the world, hillside, jackanape/spoiled child, impatient, greedy, dictator, tortoise, cloud on a lofty mountain, peacock	13	16.25
2	Sense of Self and Identity	Cactus, fragile and cruel, water wave, rough/heavy sea, volcanic eruption, ice sculpture, sun, priggish, ice floe, platonic lover, child, flower blossom	13	16.25
3	Adolescent Storm and Stress	The evolution theory, electricity, broken clock, ungrateful cat, bomb/a ticking time bomb ready to explode, tsunami, horse, rose thorn, coffee foam	11	13.75
4	Autonomy Seek	Crazy, fish in a jar, recklessness, iron, stubborn goat, dairy philosopher, kite, movie frame, chatty, a different planet, donkey	11	13.75
5	Effects of Technology	Closed box, WIFI devices, smartphone, asocial, tourist, robot, virtual game, addict, prison inmate, technology addict	10	12.5
6	Inexperience	Three-wheeled car, blind, crab, inexperienced fish, confused duck/goofy, a ship without a compass	6	7.5
7	Unpredictability	Egypt, closed box, divan poetry, madcap, heavy sea/sea wave	5	6.25
8	Macro changes/external factors	Uncontrolled flowing water, capitalism, robot, flood	4	5
9	Energy/Vigor	Cheetah, top model car, rough stream	3	3.75
10	Need for love and attention	Actias Luna/moth, clock	2	2.5
11	Recklessness	Child, Garfield	2	2.5
			n=80	100

As seen in Table 3, the metaphors for today's adolescents were grouped under the themes "macro changes/external factors", "sense of self and identity", "adolescent storm and stress", "autonomy seek", "identity development", "egocentrism", "inexperience", "need for love and attention", "energy/vigor", "unpredictability", "recklessness", "effects of technology", and "body focus".

It was found that the main emphasis was placed on "egocentrism" (f=12). The metaphors in this theme stressed the demandingness of adolescents, such as grinder, demanding manager, and greedy; but also underlined the withdrawal and inaccessibility of adolescents such as dictator, cloud on a lofty mountain, and hillside metaphors. Furthermore, some metaphors indicated certain behaviors such as jackanapes/spoiled child and impatience. A peacock metaphor also suggested their focus on body images. A group of metaphors in the "sense of self and identity" theme pointed out adolescents' impulsivity and moody behaviors. The metaphors in this theme were corn, cactus, heavy/rough sea, water wave, volcano, and sun, which indicated fluctuations in adolescent behaviors. Other metaphors were a priggish and platonic lover, which stressed the ideal self of adolescents.

Examples of the themes of "egocentrism" and "sense of self and identity" are given below.

"I think today's adolescents are like the man who saved the world because they think they know everything and can handle everything by themselves (M25)." (Egocentrism)

"To me, today's adolescents are like waves; sometimes they get excited, sometimes they calm down (M46)." (Sense of self and identity)

The parents created conflictual behavior and moodiness metaphors such as evolution theory, electricity, a broken clock, an ungrateful cat, a bomb/a ticking time bomb ready to explode, a tsunami, a horse, a rose thorn, and coffee foam for the theme of "adolescent storm and stress." The parents' metaphors regarding the "autonomy seek" included the fish in the jar, the reckless, and a different planet which indicates withdrawal and separation from parents, and the metaphors of iron, stubborn goat, the dairy philosopher, chatty, and donkey suggesting adolescents' capacity to express and defend their views. It is seen that there are metaphors such as donkey. Similar expressions are given below.

"I think today's adolescents are like bombs because they generally give a sudden burst of anger." (M78)." (Adolescent Storm and Stress).

"To me, today's adolescents are like the fish in the jar, as they live in their worlds (M15)."(Autonomy seek)

In the theme of "the effects of technology," parents described adolescents considering Internet-related tools and used metaphors such as WIFI device, smartphone, virtual game, addict, prison inmate, technology addict, and robot. However, certain metaphors stressed isolation and self-closure, such as closed box, asocial, and tourist. Examples of this theme are given below.

"I think today's adolescents are like devices operating on WIFI because they are unavailable without internet (M19).

"I think today's adolescents are like tourists because they do not live in this world, but in the world of social media (M23)."

The metaphors in the theme of "inexperience" involved a three-wheeled car, a blind crab, an inexperienced fish, a confused duck/goofy, and a ship without a compass, underlining the lack of life experiences. Example statements are given below.

"I think today's adolescents are like three-wheeled cars because they are likely to stumble while trying to manage their lives without experience (F29)."

"I think today's adolescents are like inexperienced fish; they have no experience in life (M37).

The parents produced metaphors of corn, closed box, divan poetry, madcap, and rough sea/sea waves for the "unpredictability" theme that signaled emotional and behavioral fluctuations in adolescents. For instance:

"I think today's adolescents are like corn because it is unclear when they will burst (M3)".

The metaphors in the theme of "macro changes/external factors" were uncontrolled flowing water, capitalism, robot, and flood that, emphasized adolescents' vulnerability to the influences of the near and far environment.

"I think today's adolescents are like uncontrolled flowing water because many factors affect and confuse them (F1)".

The "energetic" theme referred to adolescents' physical energy, and some parents said: "Today's adolescents are like cheetahs because they tend to move in any direction quickly (M6)". For the theme "need for love and attention," some parents stated that "I think today's adolescents are like moths flying around the light because wherever they find light, love, and attention, they go there (M4)". In the "recklessness" theme, parents described adolescents as comfort-seekers, stating that "I think today's adolescents are like Garfield; they are self-indulgent and lazy (M38)".

Parents' metaphors for "being the parent of an adolescent" are grouped under seven themes. The frequency and percentage distributions of them are shown in Table 4 below.

Table 4. Frequency and Percentage Distributions of Conceptual Categories Related to "Being The Parents of An Adolescent"

Item No	Conceptual Themes	Metaphors	f	%
1	Being patience itself	Deaf and dumb, being patience itself, referee, spoon to stir milk, rough sea, saint, stone, gnawing a stone, raising a goat	22	24.72
2	Parents as a Guide/Supervisor	Being patience itself, sun, expertise, playing ostrich, frontline friend, counselor, football match, trapped in a maze, sandbag, marathon run, a demanding sport, conductor, bunch of grapes, rescue team, tightrope walker, radar, detective, computer game, guitar spring, tumbler/roly-poly, life coach	22	24.72
3	Negative Affectivity	Melting candle, eternal payment plan, being patience itself, trauma, bomb/ticking time bomb, puppet, stress ball, panic attack, dungeon, playing with fire, as timid as a mouse, monkey, earthquake survivor, neurotic, climbing a mountain, a field full of mines, football match, Matryoshka doll, migraine	21	23.60
4	Developmental Outcomes	Chameleon, Tv audience, Tabasco pepper, Difficult and lengthy process, adolescent, spring, privileged, carry the world on your shoulder, driving in snow, making a snowman in the sun, plane tree, fruit	13	14.60
5	Uncertainty/Ambiguity	Adventure, a bottomless well, a surprise box, cooking on high heat, an unknown path	5	5.61
6	Parenting Style	Heroic commander, cotton to harvest, parsley, gardener	4	4.50
7	Parents' Big Test	Test Process, student	2	2.24
			89	100

As shown in Table 4, the metaphors related to "being the parent of an adolescent" are grouped under the themes of "parenting style," "negative affectivity," "developmental outcomes," "parents as a guide/supervisor," "uncertainty/ambiguity," "parents' big test," and "being patience itself."

The analysis results revealed that most metaphors were in the themes of "being patience itself" (f=22) and "parent as a guide/supervisor" (f=22). The metaphors in the "being the patience itself" theme included saint, a patience stone, and a spoon to stir milk, suggesting patience. Besides, some metaphors in the theme indicated keeping calm under pressure, such as gnawing a stone, raising a goat, and being deaf and dumb. The metaphors in the theme of "parents as a guide/supervisor" were characterized by occupations and professions such as expert, psychological counselor, life coach, orchestra conductor, detective, and rescue team.

There were also metaphors associated with sports activities such as football matches, marathon runs, demanding sports, and tightrope walkers. Several metaphors are referred to guide adolescents (e.g., psychological counselor, orchestra conductor, and life coach), manage their behaviors (e.g., being as timid as a mouse, sandbag), and be strategists (e.g., trapped in a maze, guitar spring). The 21 metaphors in the "Negative Affectivity" theme highlighted parental burnout, such as melting candle, eternal payment plan, being patience itself, and neurotic, and indicated parental inadequacy and helplessness, such as puppet, football match, and matryoshka doll. Moreover, dungeon, playing with fire, as timid as a mouse, and migraine metaphors emphasized that parents were under stress and pressure. Example expressions are given below.

"Being the parent of an adolescent is like being patience itself. You always have to be well-controlled and patient (M14)." (Being Patience Itself)

"Being the parent of an adolescent is like being a psychological counselor; you should always communicate with your child so that s/he gets through adolescence with few problems (M40)." (Parent as guide/supervisor)

"Being the parent of an adolescent is like a football match; you watch the goals over and over, but the match result does not change (M44).

"Being the parent of an adolescent is like a matryoshka doll; no matter how much we strive and create a new self, we are not enough for them (M54).

There were 13 metaphors in the "developmental outcomes" theme, such as chameleon, adolescent, complicated and lengthy process, which indicated parental development and change, as well as the metaphors such as tabasco pepper and steam, suggesting the changing experiences. Besides, the TV audience metaphor pointed out the decreasing importance of parents during adolescence. Example statements in this theme are presented below.

"Being the parent of an adolescent is like being a chameleon as we constantly change according to our child's mood (M4)."

The metaphors in the "uncertainty/ambiguity" theme referred to the vague nature of adolescence. This theme has five metaphors: adventure, a bottomless well, and an unknown path. The four metaphors in the "parenting style" theme were heroic commander, the cotton to harvest, parsley, and gardener. Lastly, in the theme of "Parent's Big Test," there were two metaphors: exam process and student. Example expressions are given below.

“Being the parent of an adolescent is like going on an adventure because it is difficult to predict what will happen next (M15).” (Uncertainty/ambiguity)

“Being the parent of an adolescent is like a bottomless well; you do not know what is at the bottom of it; it is dark (M57)."(Parents’ Big Test)

“Being the parent of an adolescent is like being parsley because parents want to interfere in anything about the child (M9).” (Parenting style)

DISCUSSION & CONCLUSION

This study was carried out to determine parents' metaphorical perceptions of today's adolescents and being the parent of an adolescent. The participant parent created 74 metaphors for "today's adolescents" and 77 for "being the parent of an adolescent." The most commonly used metaphors to describe today's adolescents involved bomb/a ticking time bomb ready to explode, rough/heavy sea/sea wave, closed box, child, jackanape/spoiled child, and robot.

The metaphors of today’s adolescents were categorized under 11 themes: “egocentrism”, “sense of self and identity”, “adolescent storm and stress”, “autonomy seek”, “the effects of technology”, “inexperience”, “unpredictability”, “macro changes”, “energetic”, “need for love and attention”, and “recklessness”. The most frequent metaphors regarding being the parent of an adolescent were being patience itself, chameleon, bomb/a ticking time bomb, and football match. The metaphors of being the parent of adolescents were grouped under seven themes: “being patience itself”, “parents as a guide/supervisor”, “negative affectivity”, “developmental outcomes”, “uncertainty/ambiguity”, “parenting style”, and “parents’ big test”.

It can be inferred that the metaphors that parents created for "today's adolescents" and "being the parent of an adolescent" had substantially negative meanings and connotations. Similarly, much research in the literature signaled the challenging aspects of adolescence (e.g., Buchanan & Holmbeck, 1998; Laursen, Coy & Collins, 1998; Casey et al., 2018). For instance, Buchanan et al. (1990) found that teachers and parents believed adolescence was a challenging period and that adults could influence this process.

Hines and Paulson (2006) revealed that the stereotypical beliefs of parents and teachers about adolescence were still strong and stated that adults might be under the influence of such beliefs in their relations with adolescents. Larson and Ham (1993) investigated the daily mood changes among 5th and 9th-grade students and found that older students were more likely to be exposed to adverse life events at school and home and that more than one negative experience daily was closely correlated with emotional moodiness.

When the parents’ metaphors for today's adolescents were examined, it was determined that they primarily stressed adolescent egocentrism. It was followed by the themes regarding adolescents’ sense of self and identity, stormy and stressful nature, seeking autonomy, and relationships with technology. They are primarily consistent with adolescent development. The study findings regarding emotional changes under the theme of a sense of self and identity overlap with the literature findings.

The claim of a strong bond between adolescence and negative affectivity is perhaps the oldest and strongest assumption of the adolescent storm and stress view. Hall (1904) defines adolescence as "the age of rapid fluctuation of mood," with euphoria and depressive mood extremes. Contemporary studies report more frequent and extreme changes in mood among adolescents compared to children and adults. Rosenberg's "barometric self-concept" (1979; 1986; Santrock, 2012), characterized by the short-term fluctuations in the adolescent self, also points out the sharp transition from joy to anxiety.

The themes with less harmful metaphors for today's adolescents referred to adolescents' inexperience, unpredictability, recklessness, physical energy, need for love and attention, and the effects of macro changes and external factors. However, the number of metaphors in these themes was significantly less, which might stem from adolescents' unpredictable and stormy, and stressful natures. All those themes for today's adolescents are the normative developmental characteristics of adolescents. However, parents acknowledge such developmental characteristics as problems. The inquiry behaviors may be viewed as irritable and conflictual behaviors by parents (Santrock, 2012).

Of the metaphors regarding being the parent of an adolescent, most parents emphasized certain concepts such as patience, guidance, and negative affectivity. Dishion and McMahon (1998) point out parental motivation to care, observe, and guide children in their parenting model. The researchers also address parents' changing and decreasing importance and roles during adolescence. Parents are considered supervisors who guide adolescents to reach their true potential, and they play important roles in monitoring adolescents' social relationships and managing opportunities (Hoghughi, 2004; Santrock, 2012; Stattin & Kerr, 2000). Therefore, parents' perceptions of "guide/supervisor" are consistent with the developmental process.

In addition to the negative and biased views of adolescence, some perspectives focus on positive youth development. This approach treats young people as a resource for society rather than a problem. Positive youth development mainly focuses on developing young people instead of their emotional disorders, antisocial behaviors, or learning problems stemming from past misfortunes. The positive youth development approach targets the education, training, and active involvement of children in productive activities (Damon, 2004) and promotes psychological resilience, social, emotional, cognitive, and moral competence, self-efficacy, self-determination, positive identity, and prosocial norms (Benson et al., 2007). Similarly, Adelson (1979, cited in Holmback and Hill, 1988) argues that adolescents are not in turmoil, do not tend to be irritable, impulsive, and resistant to their parents, and do not demonstrate political and rebellious attitudes.

Gilliam and Bales (2000) proposed the concept of "framing" to describe the problem of youth investment. The media has focused on framing only the problematic nature of youth, emphasizing excessive violence, impulsivity, sexuality, and risk-taking behaviors. This continuous and biased framework associated "youth" with "problem." Most studies in the literature and the results of this metaphorical study conducted with parents emphasized that adolescence was a stormy and stressful period. However, the number of studies on positive adolescent development has increased, and there is a need for more informative studies on the nature of adolescence.

Adult perceptions of adolescents, including parents and teachers, influence their relationships with adolescents and their expectations. Instead of seeing adolescence as a stormy and stressful period, sincere efforts to understand and acknowledge it as a developmental process would improve the relationship between adolescents and parents.

The stereotypic beliefs about adolescence negatively affect the relationship between adolescents and families. Therefore, psychoeducational programs and seminars can benefit both adolescents and families in changing those stereotypes and negative thoughts. There is also an urgent need for the media to review and change their messages about adolescence. In the media, portraying adolescents as sensible individuals would help them channel their energies to positive works and prefer positive role models. In this context, it is crucial to consider the opinions of different groups (e.g., teachers) and variables such as the number of children, education, and socio-economic status that may affect parents' opinions about adolescence.

This research has limitations. The first limitation is the small number of fathers participating in the study. Father involvement in research should be increased. The second limitation is data loss due to the difficulties experienced by the participants in understanding the metaphor method. More metaphorical explanations and examples can be given. The third limitation is that this study collected information from parents only through metaphors. In addition to metaphorical expressions, individual or group interviews would yield in-depth information.

Statements of Publication Ethics

The authors declare that this study has no unethical problem considering research publication ethics. The study approval was granted by the Bartın University Social and Human Sciences Ethics Committee.

Researchers' Contribution Rate

The first author contributed to writing the problem statement and data collection. All the authors contributed to the literature review and examined the data. The first author contributed data analysis. All the authors contributed to interpreting the results, reporting, and checking the final form of the manuscript.

Conflict of Interest

The authors declare no conflict of interest.

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BARÜ Bartın University Journal of Faculty of Education BUEFAD

2023, Volume 12, Issue 1, 124-145
dergipark.org.tr/buefad
DOI: 10.14686/buefad.988894

Teaching Socioscientific Issues through Scientific Scenarios: A Case Evaluation Based on Secondary School Students' Views

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Research Article
Received: 31.08.2021
Revised: 15.07.2022
Accepted: 09.08.2022

ABSTRACT

The aim of this study is to make a situation assessment of student views on the processing of socioscientific issues through scientific scenarios.As a sample of socioscientific issues, the 'DNA and Genetic Code' unit, which is included in the secondary school science curriculum, was taken as the basis. The study was conducted with 8th grade students in a public school. As a method, a case study was used, which allowed the students' views to be examined in depth. The data were collected with an opinion form and semi-structured interviews. The opinion form data were analysed by content analysis, and semi-structured interviews were analysed by descriptive analysis. At the end of the study about the teaching of the socioscientific issues of 'DNA and Genetic Code' unit through scientific scenarios, it was revealed that the students thought that their academic achievement increased, scientific scenarios provided permanent learning, scientific scenarios were effective in associating lessons with daily life, and their awareness of social issues increased. According to the findings obtained from the students, the teaching of socioscientific issues through scientific scenarios increases the interest and motivation towards the lesson, makes the lesson enjoyable and fun, and facilitates understanding. In line with the experiences and findings obtained from the applications, suggestions were made for the use of scientific scenarios in the teaching of socioscientific issues.

Keywords: DNA and genetic code, scientific scenario, socioscientific issues, student views

Sosyobilimsel Konularının Bilimsel Senaryolarla Öğretimi: Ortaokul Öğrencilerinin Görüşlerine Dayalı Bir Durum Değerlendirmesi

ÖZ

Bu çalışmanın amacı, sosyobilimsel konuların bilimsel senaryolarla işlenmesine yönelik öğrenci görüşlerinden bir durum değerlendirmesi yapmaktır. Çalışmada sosyobilimsel konular olarak ortaokul fen bilimleri dersi öğretim programında yer alan 'DNA ve Genetik Kod' ünitesi temel alınmıştır. Çalışma bir devlet okulunda 8. Sınıf düzeyinde öğrenim gören öğrenciler ile yürütülmüştür. Yöntem olarak öğrenci görüşlerinin derinlemesine incelenmesine imkân veren durum çalışması kullanılmıştır. Veriler görüş formu ve yarı yapılandırılmış görüşmeler ile toplanmıştır. Görüş formu verileri içerik analizi, yarı yapılandırılmış görüşme verileri ise betimsel analiz yöntemiyle analiz edilmiştir. Çalışmanın sonunda DNA ve Genetik Kod ünitesi bağlamındaki sosyobilimsel konuların bilimsel senaryolarla işlenmesi hakkında öğrencilerin; akademik başarılarının arttığını, kalıcı öğrenmeler sağladıklarını, ders ile günlük hayatın ilişkilendirilmesinde bilimsel senaryoların etkili olduğunu ve toplumsal konulara karşı farkındalıklarının arttığını düşündükleri ortaya çıkmıştır. Öğrencilerden elde edilen bulgulara göre sosyobilimsel konuların bilimsel senaryolarla öğretimi; derse karşı ilgiyi ve güdülenmeyi arttırmakta, dersi zevkli ve eğlenceli hale getirmekte ve anlamayı kolaylaştırmaktadır. Bulgular doğrultusunda bilimsel senaryoların sosyobilimsel konularının öğretiminde kullanımına yönelik önerilerde bulunulmuştur.

Anahtar kelimeler: DNA ve genetik kod, bilimsel senaryo, sosyobilimsel konular, öğrenci görüşleri

To cite this article in APA Style:
Ören, F. Ş., Karapınar, A., Sarı, K., & Demirer, T. (2023). Teaching socioscientific issues through scientific scenarios: A case evaluation based on secondary school students' views. *Bartın University Journal of Faculty of Education, 12*(1), 124-145. https://doi.org/10.14686/buefad.988894

INTRODUCTION

One of the main purposes of science education is to enable students to develop skills that are appropriate for the needs of the age in addition to acquisition of knowledge. Especially, providing students with the knowledge, skills and competencies that will enable them to solve problems encountered in real life has a great place in science teaching. At this point, it is important to create rich learning environments and content arrangements for transferring the subjects learned in science classrooms to real life. In this context, it is not possible to consider socioscientific issues separately from science classes, which have subject content related to almost all of daily life. Socioscientific issues (SSIs), which allow the development of skills (Owens et al., 2020) such as solving scientific problems encountered in real life (Proudfoot & Kebritchi, 2017) and beyond that, being able to discuss and make decisions (Dauer et al., 2017; Ladachart & Ladachart, 2021; Ramírez Villarín, 2020) in socioscientific terms, have taken their place in science teaching programs (Ministry of National Education [MoNE], 2018). Therefore, important science research centers around the world also emphasize the necessity to develop students' skills in SSIs in terms of being discussed and analysed with a critical point of view and making informed decisions within the framework of logic (National Research Council [NRC], 1996; Queensland School Curriculum Council, 2001). Hence, it can be stated that students' discussions on science-related issues, using the scientific knowledge they have acquired in their daily life, and continuing to learn science throughout their lives are among the primary goals of science education (NRC, 2012). In this case, it can be said that SSIs, which are considered to be more suitable for discussion in many countries, have become an indispensable part of teaching programs (Dawson & Venville, 2009). It can be stated that SSIs have played an important role as a learning situation among modern science teaching practices in recent years.

In today's world, individuals constantly face with SSIs in life. According to Öztürk and Leblebicioğlu (2015), SSIs can be viewed from different angles, cannot be solved in a single and simple way, and contain especially scientific and ethical dimensions. Türkmen et al. (2017), on the other hand, define SSIs as difficult and controversial issues that societies deal with from different perspectives. Areas related to environmental problems such as cloning, stem cell treatments, biotechnology and genetics such as GMO products, global warming, hydroelectric power plants, and the establishment of nuclear power plants can be given as examples (Chen & Xiao, 2020; Karpudewan & Roth, 2018; Sadler, 2004; Topçu, 2015; Woolley et al., 2018). These issues take their contents from the phenomena that can be encountered in daily life, and the social concerns and ethical dilemmas discussed in this context should not be considered separately from science classes (Sadler, 2011; Sadler et al., 2006). In addition, although they are not independent from the content of science lessons, SSIs, which have both science content and social dimensions, have a great potential to arouse interest among students since they cover different perspectives (Eastwood et al., 2012).

Various teaching methods and techniques are used during the teaching of SSIs that are expected to raise awareness in science classes. While Christenson and Walan (2022), Martini et al., (2021), Rebello et al., (2013) and, Suephatthima and Faikhamta (2018) use argumentation in teaching SSIs, Carson and Dawson (2016), Kinskey & Zeidler (2021) and Ottander and Simon (2021) use scenarios. The use of scenarios is also included in studies using the argumentation method (Dawson & Carson, 2020). Scientific scenarios are among the primary methods that can be used for this purpose when evaluated in the context of their characteristics. It can be stated that it would be more effective to use scientific scenarios that contain examples of life in the teaching of SSIs. Because scientific scenarios include controversial situations that will enable argumentation in the solution process of problems based on daily life examples in the scenario (Rebello et al., 2013; Suephatthima & Faikhamta, 2018). Many researchers (Garrecht et al., 2020; Günter, 2020; Mills et al., 2021; Mio et al., 2019; Sailer et al., 2021; Shen et al., 2021; Zeidler et al., 2019) mention the benefits and effectiveness of using scenarios with different strategies, methods and techniques in education. In this context, scientific scenarios are used in studies such as problem-based teaching (Günter, 2020), online learning (Mio et al., 2019; Sailer et al., 2021; Shen et al., 2021) and socioscientific issues (Garrecht et al., 2020; Zeidler et al. al., 2019). Genetic issues, which we face frequently in daily life, are also discussed within the scope of SSIs. Concepts and phenomena related to genetics, which is a controversial subject, are included in the "Dna and Genetic Code" unit in the Science curriculum (2018). Genetic studies, the relationship between diseases and genetics and the like are among the topics we have heard the most in daily life in the past few years. For this reason, it is very important to use scientific scenarios in the teaching of SSIs (Garrecht et al., 2020; Zeidler et al., 2019) and to connect with daily life in scenarios. Scenarios are learner-centered because they are life-related, that is, they allow information to be associated with daily life. For this reason, it is stated to be one of the ideal methods for secondary school students in the concrete period (Bakaç, 2014). Similarly, Erduran Avci and Bayrak (2013) also see the use of scenarios in science classes as a powerful learning tool, especially for secondary school students. Teaching SSIs including social dilemmas and problems with scientific scenarios helps

to carry daily life to the classroom environment and to develop students' critical thinking skills (Rahayu et al., 2017; Tol, 2018). It also activates mental processes such as questioning, decision making, problem solving, analysis and interpretation, which are closely related to critical thinking (Ertaş, 2012). In addition, in the 2018 Science Lesson Curriculum in Turkey, "Developing reasoning ability, scientific thinking habits and decision-making skills by using SSIs" (MoNE 2018, p.9) is mentioned. Therefore, the use of scenarios for the teaching of SSIs in science education plays an important role in terms of more than one skill acquisition dimensions.

Considering all these, the 'DNA and Genetic Code' unit, which mainly includes SSIs, is taught through scientific scenarios, which is a method suitable for developing high-level skills expected in the student. In addition, according to Yavuz Topaloğlu and Balkan Kıyıcı (2017), the events that SSIs are related to daily life are a situation that individuals of all ages can encounter. But, when the studies on the subject are considered, SSIs are mostly examined with pre-service teachers and their effects on some variables (Evren Yapıcıoğlu, 2016; Sönmez & Kılınç, 2012). However, there are almost no studies done with secondary school students who will be the adults of the future. When the information obtained from the literature is synthesized, it is understood that the use of scientific scenarios that allow association with daily life in teaching socioscientific issues is especially important for secondary school students in the concrete period. In this context, it is thought that the evaluation of the teaching practice on the subject and the students' views on this practice will be a step towards closing this gap in the literature. Students' opinions obtained from this research will contribute to future studies (qualitative, quantitative or mixed) on the teaching of socioscientific issues at the secondary school level. In the literature, socioscientific issues are mostly considered in a transdisciplinary structure. Presenting problem situations gains importance in the learning of socioscientific issues. Scientific scenarios provide an opportunity to present dilemma situations. With the characters in it, students can enter the situation-event-phenomenon and actively participate in problem solving. In addition, scientific scenarios can be associated with daily life. Thus, it becomes easier for students to perceive and comprehend socioscientific issues. This opportunity can be presented with scientific scenarios by putting socioscientific issues that need to be examined from a critical perspective. Considering the local and global importance of socioscientific issues, their effects on the health of living things and global citizenship, they are within the scope of subjects that individuals should especially learn. In addition to learning these subjects, they need to be examined in order to form individual and collective ideas about them. As a result of the synthesis reached from the literature, it is thought that the characteristics of the scientific scenarios and the advantages they provide to the teaching environment will be effective in the perception and teaching of socioscientific issues. In this sense, it is thought that conducting the study with an 8th grade study group will make a significant contribution to the literature by revealing the effectiveness of scientific scenarios in learning with the views of students in terms of age range. For this reason, the purpose of this study is to make a case evaluation from the students' views regarding the teaching of SSIs through scientific scenarios.

METHOD

Research Design

In this study, case study as one of the qualitative research designs was adopted. The case study is a method that allows in-depth analysis within a certain time frame by focusing on real life-related phenomena, event, situation, individual(s) (Creswell, 2003). In case studies, the "case" can be an individual, a situation, an event or the implementation of a specific program (Glesne, 2011, p. 30). In this research, the case is handled as teaching a unit (DNA and genetic code) that includes SSIs in the curriculum with scientific scenarios. Since the case in the research was handled as a single unit (Yıldırım & Şimşek, 2013, p.327), the nested single-case study was adopted (Seggie & Bayyurt, 2015, p. 123). In this design, more than one subunit can take place in a single situation. Therefore, there is more than one analysis unit (Yin, 2003). In this study, this design was used since a situation assessment was made from students' views in the context of teaching a unit that includes SSIs in the curriculum with scientific scenarios.

Study Group

The research was carried out at the xxxx Secondary School in the Aegean Region of Turkey in the 2018-2019 academic year. A random class (8/C) was chosen among the classes studying at the 8th grade level. Purposive sampling method was first adopted in the study. Purposive sampling is seen as useful in explaining facts and events in many situations. It is used when it is desired to work in special situations with certain characteristics (Büyüköztürk et al., 2012), and it allows for in-depth study (Yıldırım & Şimşek, 2013). While the research was being planned, it was decided to implement it in the school where 8th grade students and one of the researchers worked as a teacher. For this reason, purposive sampling method was adopted in the sample selection of the study.

The research was conducted with a total of 18 students in this selected class. Ten of these students were girls and 8 were boys. In this context, the study group has a balanced distribution in terms of gender. Considering the ethical values, the students were coded as S1 (Student 1), S2 (Student 2),…, S18 (Student 18).

Secondly, the stratified purposive sampling method was chosen. This method is preferred because it allows to show and describe the characteristics of certain subgroups of interest (Büyüköztürk et al., 2012). The reason for choosing stratified purposive sampling is that the students to be interviewed in the study are divided into low, middle and high level groups according to their academic achievements. In this context, students were divided into low, medium and high levels according to their academic achievement. Two groups of five were chosen among these students to reflect the whole group. Focus group and individual interviews were conducted in order to reach more student opinions instead of taking the opinions of the students in the whole group. One-on-one interviews were conducted with five students in the first group. A focus group discussion was held with the students in the second group (group of five students). The students who participated in the focus group interview were given the codes FocusA, FocusB, FocusC, FocusD, and FocusE to indicate that they were in the focus group. Therefore, two-level samples (Merriam, 2009; Turan, 2013, 79) were selected in accordance with the nature of qualitative case studies in the research.

Data Collection Tools

In the study, semi-structured interview questions and an opinion form were prepared in order to determine the student views about the teaching of the DNA and genetic code unit with scientific scenarios. Each of these instruments is introduced below.

Opinion Form

As a data collection tool in the study, the 'Opinion Form' was used to determine the student views about the teaching of the DNA and genetic code unit through scientific scenarios. The opinion form consists of seven structured questions. These questions were open-ended and expert view was used to ensure their validity. Two of the experts are lecturers in science education, one has a master degree in science education, and two are experienced science teachers. In addition, the form was used after determining its comprehensibility with a few students at the same grade level outside the sample. As an example of the questions in the opinion form;

Question 3: 'Do you think that the way the lesson is taught in the 'Science and Genetic Code' unit with scientific scenarios helps you to establish a relationship between the science subjects you learn in the unit and daily life? How? Can you explain with an example?' can be given. All of the interview questions are given in Appendix 2.

The opinion form was applied to the entire study group in 30 minutes at the end of the process.

Semi-Structured Interview

In the study, questions created for the opinion form in semi-structured interviews were used. Semi-structured interviews, such as obtaining in-depth information on a specific subject, asking questions again in cases where the answers are incomplete or not clear, clarifying the situation and providing the opportunity to complete the answers (Çepni, 2007) were conducted as individual and focus group interviews. In the study, one-to-one interviews lasted between 13-19 minutes, while the focus group interview lasted 42 minutes. Although interviews are frequently used to obtain detailed and explanatory information, the biggest advantage of interviews with focus group interview is that they are open to in-group interaction and allow innovative ideas to emerge, as a result of group dynamics (Bowling, 2002; Kitzinger, 1994). In addition, the data obtained from the focus group interviews provide a reliable basis for one-to-one interviews (Kitzinger, 1995). The interviews in the study were recorded by obtaining permission from the students and then they were converted into a written document. In the study, it was aimed to ensure data consistency by using both the opinion form and semi-structured interviews (McIlveen et al., 2003). When the opinion forms were examined, it was seen that the students did not express their opinions in some questions. For this reason, it is aimed to confirm the opinions expressed in writing in the opinion form with interviews and to detail them with additional questions. In addition, one focus group interview was also held, taking into account the advantages of focus group interviews with the idea of reaching more student opinions.

Process

The learning-teaching process experienced in the study is seven weeks. In this process, the 'DNA and Genetic Code' unit was taught using scientific scenarios, then the opinion form was applied, and semi-structured interviews were conducted. For the implementation process, nine scientific scenarios were created in total, depending on the conceptual sequence and limitation in the unit. Constructivist approach was taken as a basis in the preparation of these scientific scenarios, and care was taken to construct the roles of plots and characters in a way that allows students to think and structure their own knowledge. In scientific scenarios, socioscientific issues

focus on students' understanding and questioning of complex situations, seeing multiple perspectives, and developing understanding. In addition, the situations in the scenarios are handled by using one or more main scenario characters. Scenarios with global issues affecting the planet were created in line with the scope of the unit. In this context, a sample activity is presented in Appendix 1. These scenarios were developed with the collaborative work of researchers and was used after the expert's view. Before the application, the science teacher, one of the researchers, drew a general framework of the unit to the study group, information was given about the teaching of the lesson with scientific scenarios, and the student questions were answered. The distribution of the scientific scenarios used in the implementation process and the hands-on activities (e.g., doing a science experiment, model building) performed according to the subject and gains are shown in Table 1.

Table 1. Scientific scenarios and activities used in the study process

Duration	Topic	SLC (Science Lesson Curriculum) Learning Outcomes	Scientific Scenarios and Hands-on Activities
1. Week	F.8.2.1. DNA and Genetic Code	F.8.2.1.1. Explain the concepts of nucleotide, gene, DNA and chromosome and establish a relationship between these concepts. F.8.2.1.2. Shows the structure of DNA on the model. F.8.2.1.3. It expresses how DNA matches itself.	1.Learn the DNA Language i.I'm Making My Own DNA Model (Activity) i.DNA Isolation (Activity)
2. Week	F.8.2.2. Heredity	F.8.2.2.1. Defines the concepts related to inheritance. F.8.2.2.2. Comment on the results by solving problems with single character crosses.	2.Who Am I Like? i.What Percent? (Activity)
3. Week	F.8.2.2. Heredity F.8.2.3. Mutation and Modification	F.8.2.2.3. Discusses the genetic consequences of consanguineous marriages. F.8.2.3.1. Explain the mutation based on examples.	3.New Member of Our Family 4.Explosion of Chromosomes
4. Week	F.8.2.3. Mutation and Modification	F.8.2.3.2. Explain the modification based on examples. F.8.2.3.3. Makes inferences regarding the differences between mutation and modification.	5.What's This Colour Change!
5. Week	F.8.2.4. Adaptation (Environmental Adaptation)	F.8.2.4.1. Explain the adaptation of living things to the environment they live in by observing.	6.Visit to Frozen
6. Week	F.8.2.5. Biotechnology	F.8.2.5.1. Associates genetic engineering and biotechnology. F.8.2.5.2. Discusses the useful and harmful aspects of these applications for humanity with the dilemmas created within the scope of biotechnological applications.	7.Small Changes
7. Week	F.8.2.5. Biotechnology	F.8.2.5.2. Discusses the useful and harmful aspects of these applications for humanity with the dilemmas created within the scope of biotechnological applications. F.8.2.5.3. Predicting what future genetic engineering and biotechnology applications might be.	8.Professor's Historical Decision 9.Sleeping Sickness: Huntington

During the implementation, the scenarios were read by the students in question, then by the teacher, paying attention to the rules of sound and intonation. When it comes to the questions at the end of the chapter in scientific scenarios consisting of multiple parts, students are given time to write their ideas under the questions. Then, the

students' views were taken with the questions, prepared in a structure that would create a discussion and interaction environment. No intervention was made to the ideas put forward at this stage. Although there are clear answers to some questions at the end of the scenarios, due to the nature of the unit, some questions do not have a clear answer, causing students to need teacher support. In this context, the lesson teacher combined the answers given by the students to the questions and combined the clear answers and explained that the unclear ones were caused by differences of view. In the process in question, the teacher guided the process based on the students' responses and created a learning environment for students to construct their knowledge themselves.

Data Analysis

In the study, different analysis techniques were used for the data obtained from both measurement tools. In accordance with the qualitative structure of the research, content analysis was used in the opinion form analysis. According to Yıldırım and Şimşek (2006), content analysis enables qualitative interpretation of the data. Content analysis is a process performed by researchers, starting with data collection and ending with category and code extraction, and the interpretation and synthesis of data (McMillan & Schumacher, 2010). In this context, the opinion forms were first subjected to general evaluation, examples regarding the analysis of themes in terms of the way they were formed, and evaluations were made. Then, the two researchers involved in the study examined the data of the questions separately, the codes were extracted and collected under certain themes. Later, the researchers compared the codes they created, and determined both agreed and disagreed codes. The reliability of the coding was calculated according to the formula of Miles and Huberman (1994) and was found as 0.90. Since the value found was greater than 0.70, the coding was considered to be reliable. The obtained findings are presented in tables by calculating the percentage and frequency values. Semi-structured interviews were analysed using descriptive analysis and presented with direct quotations together with the data obtained from the opinion form. Descriptive analysis is used to make complex situations understandable by drawing a picture of what a situation, person or event looks like (Punch, 2005). In this context, the interview data transformed into written documents to increase its validity and reliability, were included in the process of explaining the opinion form tables in the findings section.

Validity and Reliability

The concepts of credibility, transferability, reliability and verifiability used in qualitative research literature correspond to the concepts of internal validity, external validity, reliability and objectivity in quantitative research (Merriam, 2009; Turan, 2013, 201). In qualitative research, validity is the fact that the researcher observes the phenomenon researched as it is and as impartially as possible (Yıldırım & Şimşek, 2013, 289). In this study, different data sources and different data collection methods were used to ensure credibility (internal validity). As another method of providing credibility (internal validity), expert opinion was sought in the formation of the interview questions. In order to reveal various perspectives, both focus group interviews and individual interviews were conducted. In this context, an opinion form was applied to the students and they were asked to answer the questions on paper. Afterwards, semi-structured interviews were conducted with the students on the basis of the same questions. In the semi-structured interviews, more in-depth and detailed information was obtained with additional questions. Focus group interviews were also conducted due to the possibility of interviewing more students and other advantages. It was ensured that the interviews were conducted in a depth that would enable to deal with all aspects of student views on the teaching of socioscientific issues with scientific scenarios. Negative situation analysis was used by including negative explanations among the obtained data. With this negative situation analysis, it was tried to ensure the credibility of the research (Patton 2002) by paying attention to accuracy and honesty. In addition, the consistency of the obtained data with the relevant literature was checked and the credibility of the data was tried to be ensured.

One of the suggested methods to ensure the transferability (external validity) of qualitative research is detailed description (Yıldırım & Şimşek, 2011, 270). In order to ensure external validity in the research, all the features of the research sample, environment and application process are stated in detail. All stages of the research are explained in detail. Preparation of the semi-structured interview form, data collection, analysis and interpretation are clearly stated. In addition, direct quotations from the opinion form and the individuals interviewed are frequently included. In addition, during the analysis of the data, the confirmation process was carried out by turning to the students at the points that were not understood. In this context, the results are explained based on direct quotations.

In the research, the reliability analyses of the data obtained from the opinion form, focus group interview and semi-structured interviews were made. Codification was made by two different researchers and the percentage

of agreement was calculated by finding the consensus-consistency and disagreement among the experts. Miles and Huberman (1994)'s percent agreement was used in these calculations. With all these things done, clear and objective data were presented to the reader in terms of validity and reliability in the study.

Research Ethics

The study was carried out after obtaining the permission of the ethics committee of Manisa Celal Bayar University. In addition, since the participants were between the ages of 12-14, permission was obtained from both the students and their parents. Participants and their parents gave their consent by signing 'parent consent form' and 'voluntary participation form'. Their names have been kept secret.

FINDINGS

In this section, the answers given by the students to the interview questions after the applications were evaluated and presented together, making direct quotations from the interviews.

At the beginning of the interview, first of all, students' opinions/information about whether they had taught a course similar to this method before was received. In this context, the students were asked the question *'Have you ever taught in any lesson using the same method that the 'DNA and Genetic Code' unit was taught?*'. Considering the opinions of the students on this subject, it is seen that 14 (77.8%) students stated that their lessons were not taught with scientific scenarios before and 3 (16.7%) students did not remember. In addition, one student left the question blank. It is thought that students who leave the question blank do not remember or have not previously been taught with scientific scenarios. In both cases, it was understood that a significant part of the study group (f = 14, 77.8%) gave negative answers to the question. The interviews also support this finding. For example, from the students interviewed, S1's answer was

> *"No, and therefore the lessons are very boring. Especially in math, we can have fun. For example, we would never get bored in transactions, no matter how many lessons. The history class is very boring and we would have fun if it were made in this way. In other words, our desire to come to school and our desire to read can increase."*

In this context, it is understood that the student has not been in any lesson environment in which scientific scenarios were used before, but the student would like it to be used in other disciplines.

The effect of scientific scenarios on learning

The opinions of the students on the effect of processing SSIs through scientific scenarios on their learning are given in Table 2.

Table 2. Students' views on the effect of scientific scenarios on their learning

Theme/ Category	Codes	f*	%*	Examples of Student Views
Effects of Scientific Scenarios on Learning	Increase in academic success	11	64.7	*Yes, it happened. We try once a month. Most DNA and Genetic Code units among the units I did right (S2).*
	Increase persistence	2	11.7	
	Gain practicality in solving questions	1	5.9	*I solve the questions I encounter in the tests faster and more practically thanks to the scenarios (S4).*
	Increase interest in lesson	1	5.9	
	Teacher qualification	1	5.9	*Yes, I think it has an impact on our success. Because 'DNA and Genetic Code' is a fun, easy and surprising subject. (S17).*
	Subject being fun/easy/surprising	1	5.9	

f*: It is the frequency of student views. Because a student may have given more than one answer to the same question.

%*: Frequency percentage of student views.

This situation is valid for all opinion form tables.

When Table 2 is examined, all of the students stated that learning the Science course with scientific scenarios contributed positively to their success. The students associate their views concerning the question to their academic achievement with a frequency of 64.7% and with the fact that the class made with scientific scenarios increase its being with a frequency of 11.7%. These views, which are the most common, are parallel to the expressions used by the students in the interviews. For example, Focus B made the following statements in her discourse emphasizing the increase in academic achievement

"For example, the class next door was my previous class, the classes have changed. My friend X (who is in a different class) is smarter and more hard-working than me. Then we solve questions. I saw that I was better than she was. Especially in the unit where our teacher made the scenario."

The thoughts of S10, where one-to-one interviews were held, said

"Yes. Because, for example, you read the question when there is an exam, then you immediately think of a part in the scenario right there. Therefore, even if there are many scenarios, the part there definitely comes to mind. Because as I said, it is more permanent. Therefore, since it always comes to our mind, we can make more markings; correct marking. And so we get points, we get a higher grade in the exam."

In this context, the student finds the teaching of the course effective through scientific scenarios, in that it is associated with increasing academic success, increasing permanence and gaining practice of problem solving.

The effect of scientific scenarios on associating with daily life and perspective on social problems

The students' views on the effect of processing SSIs through scientific scenarios in the research application to establish a relationship between the science topics learned in the course and daily life are given in Table 3.

Table 3. Students' views on the effect of scientific scenarios on associating subjects with daily life

Theme/ Category	Codes	f*	%*	Examples of Student Views
Effect on establishing relationships with daily life	Associating with the immediate environment	4	28.6	*Of course, there is. My parents are even remotely related. They said that my sister would be born disabled until 6 months old. But she did not (S2).*
	Associating the current event with the lesson	3	21.4	
	Change in thinking	2	14.4	*After learning that fruit yogurt is produced with biotechnological methods, I reduced consumption. (S1).*
	Presenting the example used in the lesson	1	7.1	
	consciousness-raising	1	7.1	*I explained the issue of gender determination to my mother. When my mother came across a conversation with her friends related to this, she told them that men, not women, determine gender. (S11).*
	Not using in daily life	3	21.4	*No, I can't explain because we've never experienced it (S15).* *No, I don't think it helps (S17).*

When Table 3 is examined, 78.6% of the students state that they can relate to daily life, while 21.4% of them state that they cannot relate to daily life. The students express their thoughts by associating them with their immediate surroundings at 28.6%. It was found that there were expressions parallel to this situation in the interviews. Accordingly, Focus D used the subject of consanguineous marriage, which she learned in the lesson, while evaluating an event she encountered in her family as follows:

"My sister and I are children born of consanguineous marriage. They even said (for my sister) that she will be born disabled, and then something like a miracle happened. Because my parents are relatives, even if they are not too close relatives. I later learned that if there were no consanguineous marriage, maybe it would not even be possible to be born disabled. I thought about it."

In this question, which questions the relationship established between science subjects and daily life, it was determined that the relation established with the immediate environment according to the frequency of use is followed by explanations such as associating the current event with the lesson (21.4%) and changing their thoughts (14.4%). During the interviews, Focus C and Focus D, who associate the current event with the lesson, give place to the following affirmations

"For example, we have seen the lesson on modification. You go out on the street, for example, the functioning of (genes) changes in summer. You know, I get a little darker in summer. But when winter comes again, it is the same skin colour."

In this case, it can be said that the students explain the colour change in their skin in the summer with the modification concept they learned in the lesson. In addition, it was observed that a student answered the question using the example used in the lesson, while a student answered by expressing that he used what he learned to raise

awareness in his immediate environment. 21.4% of the students stated that the teaching of the 'DNA and Genetic Code' unit with scientific scenarios does not affect the use of science subjects in the unit in daily life. In the interviews, the answer given to the question by a student (S5) who was understood to have the same view is as follows: “So not too much. No.”

The students' views on the effect of processing SSIs through scientific scenarios in the research application on the students' perspective and awareness of social problems are given in Table 4.

Table 4. Students' views on the effect of scientific scenarios on their perspective on social problems

Themes/ Category	Codes	f*	%*	Examples of Student Views
Effect on perspective on social problems	Gain awareness	3	23.1	*Yes. Because my awareness of consanguineous marriages increased. After all, not related couples will suffer from the disease, but their innocent children (S10).*
	Understanding the importance of getting accurate information	3	23.1	
	Create a limited impact	2	15.4	
	Different/ useful way of making the lesson	2	15.4	*Yes. Because, for example, when a pregnant woman gives birth to her baby, the husband scolds because the baby is not a boy. Actually, if someone is going to be angry at, that person is himself. Because it's the male that determines the gender (S4).*
	Acquire critical thinking skills	1	7.7	
	Gaining the ability to empathize	1	7.7	
	Stating that it is not effective	1	7.6	*No, I don’t think so, there is no reason (S18).*

When Table 4 is examined, it is understood that the teaching of the lessons through scientific scenarios mostly increases students' perceptions and awareness of social problems. Students state that teaching SSIs through scientific scenarios with a frequency of 92.4% affects their perspectives on social problems, while it does not affect them with a frequency of 7.6%. It is seen that the students who assert that these activities have positive effects on their perception and awareness of social problems are most frequently defined with expressions in the direction of gaining awareness of social problems (f = 3, 23.1%) and understanding the importance of accessing correct information in social events (f = 3, 23.1%). In the interviews, it was determined that some students had discourses parallel to these findings. For example, the decision given by S10 one of the students regarding social issues, hereditary diseases and consanguineous marriage expresses himself as follows:

“Yes. For example, since both of them have this gene in sickle cells, they should not marry. In the end, they will not experience this disease and the child will live. They should be aware of this. That's why they shouldn't get married. Therefore, if they had known at the beginning, at least they wouldn't have married or had no children. So, the individuals must have children of course, after all. But they have to marry someone who doesn't have this gene. For example, you have a gene and there is the same in the person you will marry so you should not marry. Because there is such a possibility.”

In addition, there were also students who expressed an view (f = 2, 15.4%) that the teaching of the course through scientific scenarios created limited, if not fundamental, changes on students' perspectives and awareness of social problems. On the other hand, the positive responses given to the question in question are also explained with expressions emphasizing different / useful in the teaching of the lesson (f = 2, 15.4%), critical thinking skills (f = 1, 7.7%) and empathy skills (f = 1, 7.7%) codes.

Although a significant majority of the answers received from the students consisted of positive expressions, it was determined that a student expressed that the teaching of the course through scientific scenarios did not affect his perception and awareness of social problems without specifying why. In the interviews, it is seen that S14, who argued that the way the lesson is taught did not change her perception and awareness of social problems, and that they could do anything in line with the wishes of the people, used the following statements:

“I do not think so because they are the same people socially. Nothing has changed, people are the same they are arrogant, they do anything to get what they want, and so it didn't. How can I say? For

instance, some people throw trash on the ground. If we say do not smoke there, they wi2ll smoke purposely."

The student who defends these views does not comment on his own awareness, but on the perspective of the individuals who make up the society.

Limitations of teaching through scientific scenarios

In the study, students' perspectives on the processing of SSIs through scientific scenarios were also discussed in the context of limitations. At this point, in order to enable the students to give more comfortable answers, the difficulties they experienced in the course teaching process and their views on what they wanted to change were discussed with repetitive questions.

The students' views on the problems and difficulties related to the process of SSIs through scientific scenarios are given in Table 5.

Table 5. Students' views about the lessons taught with scientific scenarios in the dimension of problems and difficulties

Theme/ Category	Codes	f*	%*	Examples of Student Views
Problems and difficulties in teaching through scientific scenarios	Being Enjoyable / Fun	2	28.5	*No there was no problem. On the contrary, it was very enjoyable (S5).*
	Encounter any problems	1	14.3	
	Loving the unit	1	14.3	*I had no problem. It was my favourite unit of the science course (S2).*
	Being useful	1	14.3	
	Inability to take notes	1	14.3	*After processing the script, I cannot get much notes. That's why I was afraid if I got a low grade, but I wasn't getting low. Because it was permanent (S10).*
	Inability to understand the subject	1	14.3	

When the opinion form data was examined, it was understood that some of the students did not express any view on this question. The majority of the stated views, on the other hand, are seen to contain ideas that draw attention to the absence of anything missing in the practices and that they do not experience difficulties. Under the theme "I had no problems in teaching with scientific scenarios", 28.5% of the students stated that the lessons were fun. In addition, 14.3% of the students found out that they did not have any problems, 14.3% of the students liked the unit, and 14.3% of the students found it useful to teach the lessons with scientific scenarios. It was found that there were statements in parallel with these findings in the interview data. However, when the opinion form and the interview data are evaluated together, the students stated that they did not experience any problems or difficulties with a frequency of 71.4%, while 28.6% stated that they did. S14's views on the question was as follows: "There is no problem. I think scientific scenarios made all of this easier. There was a problem the first time because I was thinking narrowly, they were wrong. In others, I started to think extensively, while the teacher told us. That is why I didn't have much enthusiasm at first. Then I got enthusiastic. Because strange things have happened (in the scenarios). Let's learn these, maybe it will be useful, it will come from somewhere." In this case, it is understood that the student was not eager to participate to the course with scientific scenarios due to the narrow perspective at the beginning of the applications, but with the effect of the course teacher, he has succeeded in looking at the events in the scientific scenarios in multiple ways. In addition, it can be inferred that scientific scenarios eliminate all difficulties and increase the desire to learn because interesting events are processed according to the student.

In addition, the two students' thoughts on the subject are 'Yes' unlike the others. As the reason for this answer, it was understood that the students used the explanations that they had problems to take notes in the course (f = 1, 14.3%) and could not understand the subject (f = 1, 14.3%). During the interviews, one of the students, S10, expressed this finding with his expressions:

"There was. We work from the script, then, for example, our teacher asked us to take notes. But I think those notes are not enough. In other words, there is definitely a missing subject from the scenario. So I think it's missing. For example, if we work on the board, different things will come to our teacher's mind, who will tell us them or write them, and we will take notes. So, for example, you can open it and look at it, but when you open the scenario and look at it, sometimes you understand the normal classic, but you want to go deeper, you want to go into more detail, but it just doesn't work. You can think of the wrong things.

But over time, all that confusion fits into its place. I thought that way, yes that is true! really and, I was reasoning then, I was thinking was that really wrong? You think about and say was it really like this. Then you just remember it like this. This is fine."

The student thinks that the scientific scenarios used in the course do not provide information about all the topics and states that they need detailed notes. He is also worried about the fact that the contradictory issues covered in the scenarios may confuse him in individual studies. However, it is still seen that the student accepts the effect of the scenarios in terms of permanence. Although it does not appear in the opinion form findings, it was determined that the interviews included another difficulty encountered during the implementation process. One of the students, S16, expressed the difficulty he faced in the process with his solution proposal as follows: "For example, scenarios can be turned into movies. We are studying in class, but if it is made as a movie for example, it might be better, it could be more fun. Reading is more difficult."

It is aimed to obtain data on the limitations of the process of processing socioscientific issues through scientific scenarios. The students' opinions regarding the changes in the teaching process in the process are given in Table 6.

Table 6. Students' Views on Their Suggestions for Changes in Applications

Theme/ Category	Codes	f	%*	Examples of Student Views
Suggestions for changes in teaching through scientific scenarios	Continuity / meaningfulness of the way the lesson is taught	7	41.1	*I wouldn't want to change anything. It can stay that way. I would like the scenarios to be distributed in other courses. (S5).*
	Continuity of scenario usage	6	35.3	
	Use of scenarios in other disciplines	1	5.9	*I don't want to change anything. Because everything is beautiful and more meaningful, it doesn't need to be changed (S8).*
	Ensuring faster understanding	1	5.9	*I wish there was a scenario in each unit. So we understand more and faster (S9).*
	Request not to keep a diary	1	5.9	*Instead of writing a diary, I would talk about scenarios with students as if they were talking during a lecture. (S10).*
	More experimentation request	1	5.9	*I'd shoot videos and put experiments (S14).*

In the sixth question of the opinion form, the aim is to put forward the reasons why students would change or not if they were given the chance to make changes in the practices and studies. In this context, 88.2% of the students stated that they did not want to make changes and they were satisfied with the application, and 11.8% stated that they wanted to make changes. In a total of 15 statements that found the practices and studies sufficient and successful, it was seen that the most frequently stated thought was to ensure the continuity of the teaching style and to find it meaningful (f = 7, 41.1%). It is a striking finding that some of the students who do not want to make changes emphasize the continuity of the use of scenarios in lessons (f = 6, 35.3%). In addition, there are one student who draw attention to the use of scenarios in other disciplines and one on their contribution to faster understanding. In the interview data, there are statements in parallel with the opinion form data. S16 who had one-on-one interviews explained the fact that he does not want any change in the application/work as follows:

"I won't make changes. I wouldn't change a thing. After having read the scenario for instance, if everybody prepared a presentation about it, about what they understood from it, so everybody would show at least what they understood. In the lessons, the teacher only writes on the board, everyone is listening to him. But in this way (with scenarios), for example, everyone is presenting their ideas by raising their finger, it is better."

According to this answer, the student in question did not want to make changes in the practices, but suggested preparing presentations to reveal what was understood after scientific scenarios. In addition, it is seen that the students are pleased to become active participants thanks to the activities used in the implementation process rather than being passive listeners of the course. Another student's reason for not wanting to change the applications is striking. This student (S5) made the following statements in the interviews:

"Scenarios were more effective than normal. Normally, I did not notice much when the teacher told the lesson. Before the scenarios… I was embarrassed when I had to talk to the teacher in case I make a mistake. However, I feel more comfortable as I write in the scenarios. As I was a little bit hesitant when talking to the teacher, I felt more comfortable writing so I wouldn't want any change."

As it can be understood from the statements in question, it is understood that the student avoids communicating with his teacher for the worry of making mistakes, but when the lesson is being taught with scientific scenarios, giving written answers to the questions in the scenario relaxes the student.

DISCUSSION & CONCLUSION

When the findings of this study aiming to determine the views of secondary school students regarding the teaching of the 'DNA and Genetic Code' unit through scientific scenarios of SSIs, the feelings and thoughts of the students regarding the teaching of the unit through scientific scenarios of SSIs were generally positive. By revealing the difficulty of the unit, the students found that teaching SSIs through scientific scenarios contributed to permanence and academic success.

When the literature is examined, there are studies in which scientific scenarios are used in different disciplines and levels such as mathematics, laboratory, undergraduate courses, as well as science courses. Bakaç (2014) stated that scenarios are effective in increasing student achievement in the field of measurement learning in mathematics lesson; Kocayusuf (2014) revealed that a complete learning strategy supported with scenarios increases academic achievement in sixth grade mathematics lesson in primary school. Similarly, Ciraj et al. (2010), in their studies to determine the microbiology field knowledge and the interest in the lesson, concluded that the use of scenarios increases students' interest in the lesson and the permanence of what is learned. Ercan (2019) stated that the use of scenarios that quoted from daily life in experiments positively affected the students' attitudes towards the laboratory and their laboratory use self-efficacy perception increased. In this case, scientific scenarios can be used in the teaching of many courses, including the science course. In addition, this finding reveals that students are satisfied with the use of scientific scenarios. Therefore, it is important to use scientific scenarios that allow the learner to solve any problem by using interdisciplinary knowledge and skills. However, students will be pleased with scientific scenarios containing complex problems related to daily life in order to provide various solutions for the problems related to the goals and achievements in these disciplines, especially in order to integrate disciplines that deal with SSIs. As a matter of fact, an interdisciplinary context emerges by emphasizing the connection between the concepts of environment, health and society in disciplines that deal with SSIs (Alkış Küçükaydın, 2019). When the literature is examined, there are studies in which scientific scenarios are used in different disciplines and levels such as environment (Alkış Küçükaydın, 2019; Dawson & Carson, 2017; Carson & Dawson, 2016), health (Keskin-Samanci et al., 2014; Lin & Hung, 2016; Saad et al., 2017) and social issues (Evren Yapıcıoğlu, 2020).

All of the students participating in the study think that teaching the course through scientific scenarios contributes to their success. These thoughts, on the other hand, were supported by the increase in academic achievement and the increase in remembering the lessons. In the interviews, along with these ideas, it was determined that the method was effective in increasing the problem solving practice. The literature also supports these findings. In fact, Yeniceli (2016) concluded that the use of scenarios has an effect on students' academic achievement and improves their attitudes towards the science course positively. Kocadağ (2010) found that the effects of scenarios on 8th grade students' misconceptions and knowledge deficiencies about heredity, DNA and genetic code were effective in eliminating misconceptions and lack of knowledge.

Teaching of the 'DNA and Genetic Code' unit through scientific scenarios has mostly positive effects on students in establishing a relationship between science subjects in the unit and daily life. The scientific scenarios

used in the study deal with many concepts such as consanguineous marriage, mutation and modification events, cloning, genetic engineering, and biotechnology in the socioscientific issue the content of the unit in question. These concepts are reflected in scenarios that can be encountered in daily life and give students experience, and this provides the connection established with the close environment. Taşkın Can et al. (2006) stated in their study that scenarios play an important role in the student's ability to use information and understanding that knowledge is mixed with life. In this case, including events taken from students' daily life in scientific scenarios contributes to their knowledge structuring and learning. According to Temur and Turan (2018), scientific scenarios enable students to reach a conclusion with possible options by presenting various events. This is an indication that scenarios are a form of experiential learning. In fact, in real life, we come up with choices regarding some events and we enter the decision-making process. Therefore, learning will take place by making the students make decisions. Thus, students learn within the framework of a set of rules and as an experience, without resorting to memorization (Mariappan et al., 2004). In this context, SSIs through scientific scenarios that include events taken from their daily lives will be effective in solving problems by concretizing events, structuring knowledge and providing permanent learning. Therefore, the most important point where SSIs and scientific scenarios intersect is that students can embody real-life events. In this case, the inclusion of realistic scientific scenarios, especially in the teaching of socioscientific subjects, will enable students to be more interested in these subjects and to evaluate events with multiple perspectives.

It was understood that the use of scientific scenarios in the teaching of the unit increased students' perception and awareness of social problems. The students used expressions to gain awareness of social problems, to reach the right information in social events, to acquire critical thinking skills and to gain empathy. It is understood that scientific scenarios involving SSIs positively affect students' perspectives on SSIs. Actually, the nature of the 'DNA and Genetic Code' unit is based on SSIs. These issues are based on society and science, and students can establish relationships between lessons and social problems through scientific scenarios. Simonneaux (2008) affirmed that students need to produce scientific arguments in learning the mutual relationship between society and science. For this reason, discussion and decision-making environments that can provide argumentation such as the use of scientific scenarios in teaching SSIs are also important. In this context, it is thought that issues that create dilemmas and are open to discussion offer students the opportunity to make decisions through scientific scenarios and affect their perspectives on social events. Actually, Sönmez (2020) stated in his study that scenario-oriented activities attracted students' attention and they tended to think with different perspectives that explored and questioned during the lesson. In this case, giving place to scientific scenarios with scientific subject content enables students to gain different perspectives.

The students thought that the lesson was enjoyable and entertaining, and they generally did not encounter any problems or difficulties about the 'DNA and Genetic Code' unit being processed with scientific scenarios. The students liked the unit and found the use of scientific scenarios useful. According to the students, scientific scenarios eliminate all difficulties and increase their desire to learn because they deal with interesting events. However, some students had problems not taking notes in the course and therefore they were not sure that they understood the subject. In this case, some students adhere to traditional teaching and try to create resources by needing detailed notes. There was also a suggestion in the findings that it is difficult to read the scenarios and that it would be better to make scientific scenarios into films. In this case, the importance of gaining the students reading habit emerges. Can et al. (2016) and İşeri (2010) found in their study, that as the grade levels of secondary school students increased, their reading attitudes decreased. When we take into consideration the fact that the sample of the study is at the 8th grade level and that these students prepare themselves to the most important national exam of Turkey which is the 'LGS' (Transition to High School Exam, multiple choice questions decrease reading interest. In addition, Önen Öztürk (2017) states that educational short films ensure that the lesson is fun, relevant to daily life, permanence and better understanding. In addition, while Öztaş (2008) found that the use of films increases students' interest and motivation towards the lesson and encourages them to research, similarly Selanik Ay (2010) states that films are fun and improve their research ability. In this case, educational films that give the same results as scientific scenarios can be used effectively in the teaching process, and transforming the scenarios into films will be effective in terms of teaching. We think that this suggestion of the student should be experienced. We think that it may be important to conduct research in this context.

There are students who stated that the 'DNA and Genetic Code' unit, which is processed through scientific scenarios, provides them with skills such as critical thinking, empathy and expressing their ideas. This is in line with the idea that scenarios offer students the opportunity to develop critical thinking skills for more effective learning (Mostert, 2007). As a matter of fact, individuals who think critically can defend their ideas independently and take an active role in the process (Ersoy & Başer, 2011). These results show similarities with the results of

other studies that the use of scenarios contributes to students' permanence (Parladır, 2004), their ability to develop different thoughts (Kindley, 2002), to express these thoughts. Sadler and Zeidler (2005) determined that students interpreted scenarios on human cloning and genetic engineering morally and were able to incorporate content knowledge into their reasoning patterns. Pehlivanlar (2019), on the other hand, emphasized that the scenarios prepared on the green road, nuclear energy and genetically modified organisms affected the informal reasoning of teacher candidates. Similarly, Khishfe (2012) found that high school students' understanding of the nature of science improved in two scenarios that addressed controversial SSIs related to genetically modified food and water fluoridation. Venville and Dawson (2010) determined that students make intuitive reasoning about biotechnology.

Scientific scenarios involving socioscientific issues play a very important role in increasing students' interest in the lesson, ensuring their meaningful and permanent learning, and improving their moral values, as they include events that can be encountered in daily life (Atabey et al., 2018). Therefore, it can be stated that choosing the content of socioscientific issues from the topics that can be encountered in daily life increases the attitudes, interests and motivations of the students. In addition, it was seen that the data of the opinion form indicated that the students found the scientific scenarios enjoyable and contributed to the visualization of the examples in the scientific scenarios in their minds. In his study, Kemiksiz (2016) states that the scenarios help students to bring the problems of daily life to the classroom and to revive them and to reconstruct the knowledge. Similarly, according to Çenberci and Tol (2019), learning with scenarios supports students' self-efficacy perceptions, as students have the chance to put themselves in the place of the characters in the scenario, connect with real life, and take an active part in the lessons. Considering all these, it is understood that in this study, in line with student opinions, the use of scientific scenarios in the teaching of socioscientific issues allows students to develop positive emotions and thoughts such as attitude, visualization, active participation in the lesson in the teaching process, interest, motivation and success.

According to the data obtained from the opinion form and interviews, the use of scientific scenarios in the teaching of SSIs has positive effects on variables such as students' motivation, attitude, success, argumentation skills, reasoning, decision-making skills, and high-level thinking skills. With the use of scientific scenarios in the teaching of SSIs in the literature, it is seen that studies examining the effect of variables such as argumentation skills (Dawson & Carson, 2020; Karamanlı, 2019; Yalçın, 2018), conceptual understanding (Sönmez, 2020), attitude and motivation (Evren & Kaptan, 2014), reasoning (Dawson, 2015; Kolarova et al., 2013; Özden, 2020; Romine et al., 2020), decision making (Demiral & Türkmenoğlu, 2018; Emery et al., 2017), higher-order thinking (Qamariyah et al., 2021) also support this finding. In this case, within the scope of this study, it is concluded that the use of scientific scenarios in the teaching of SSIs in the direction of student opinions is effective and productive in science lessons.

Conclusions

In the study, the students' discourses on the teaching of the 'DNA and Genetic Code' unit through scientific scenarios were parallel in both data collection tools and were found effective and meaningful by the students. In this context, the use of scientific scenarios increases the academic success of students, provides permanent learning, plays a serious role in the association of lessons with daily life, and increases students' awareness of social issues. In addition, when the social awareness formation process that occurred in students was examined, skills such as critical thinking, decision-making, argumentation, and empathy that students discovered in themselves were encountered. Scientific scenarios have a nature that creates dilemmas and allows discussion to be effective in the development of these skills. In this case, the courses taught with scientific scenarios enable students to develop various skills and these are in line with the requirements of the 21st century.

The students did not encounter any significant problems in the process of teaching the course through scientific scenarios. In this context, students think that scientific scenarios increase interest in the lesson, make the lesson enjoyable and entertaining, facilitate understanding, and increase motivation. However, during the application process, there are also students who are uncomfortable with not keeping systematic notes as in the traditional method and suggesting to converting scientific scenarios into videos / films rather than reading them. In addition, there are also ideas that refer to more experimental activities in the 'DNA and Genetic Code' unit, which is teached through scientific scenarios.

Suggestions

When all the ideas of the students in the research are evaluated together, it is seen that the students are mostly satisfied with the scientific scenarios and the lesson. For this reason, it can be suggested that SSIs should be treated with scientific scenarios in science education. Based on the research findings, it is seen that the students are of the opinion that other units and other lessons should be taught with scientific scenarios. In this direction, studies in which scientific scenarios are used in the teaching of different science units/subjects and other courses

can be planned. Based on the findings obtained from the students' views on the skills, the effects of the teaching practices carried out with scientific scenarios on different skills (thinking skills, critical thinking, problem solving, decision making, etc.) can be tested with quantitative or mixed studies. The scientific scenarios proposed to be designed are more effective in science subjects that are less likely to experiment. In addition, the teaching of socioscientific issues that are included in the science-teaching program and create dilemmas can be provided with scientific scenarios. Considering the references made by students to the increase in their academic achievement, it is recommended that the use of scientific scenarios be widespread at all educational levels, if they are suitable for the subject content.

Statements of Publication Ethics

Date of ethical evaluation decision: 01/10/2018

Ethics evaluation document issue number: E.46544

Researchers' Contribution Rate

Author 1 (%35), Author 2 (%22,5), Author 3 (%22,5), Author 4 (%20)

Conflict of Interest

There is no conflict of interest in this study.

Acknowledgement

This study was supported by the Manisa Celal Bayar University Scientific Research Projects Coordination Unit. Project Number: 2018219

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APPENDIX

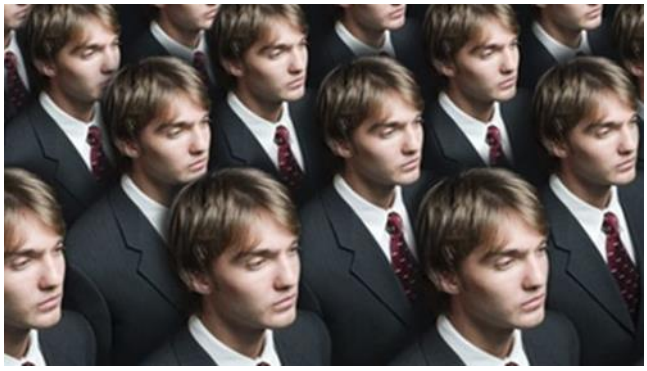
Appendix 1

Scenario -7 (19-25 November 2018)

Small Changes

Mr. R is a 45-year-old genetic engineer. He wants to change gene structures by interfering with the genes of plants, animals and even humans. In this way, he set himself on the mind of being able to add new features to existing creatures and to create gifted creatures by bringing together beneficial genes in different living things. Using various biotechnological methods for this, Mr. R is quite curious about the results. He started his work primarily with strawberries. Strawberry is a very sensitive fruit that can only grow in hot conditions and which deteriorates and rots quickly. However, considering that the population is rapidly increasing, people in every geography need a type of strawberry that can withstand cold weather and transportation in order to eat strawberries. Starting out from this problem, Mr. R took advantage of polar icefish to make this delicious fruit cold resistant. Mr. R succeeded in taking the gene region that enables the ice fish to survive at - 35 degrees and add it to the DNA of the strawberry with biotechnological methods. Thus, strawberries will be able to grow easily in cold weather, the living space will increase and strawberries will be produced as much as all people can eat in all seasons. Mr. R wants to apply this method to many fruits such as kiwi, banana and tomato and to put the seeds of these fruits on the market. But can the strawberry, whose genetics has changed, be harmful to human health even though it positively affects the growing conditions and durability?, he also thought. Mr. R plans to do a study with experimental and control groups to test this idea. Two groups take 10 mice each. He ensures that 10 mice in the experimental group eat the genetically modified strawberries and 10 mice in the control group eat the normal strawberries and observes the results. Although there was no health problem in the control group after a certain period, 1 out of 10 mice in the experimental group had various allergic reactions. Concluding that the genes coming from the ice fish caused this situation, Mr. R was caught between the allergic reactions that occurred with the response of humanity to the nutritional needs and wanted to think a little more before putting the strawberry on the market.

1. If you were Mr. R's, would you put the seeds of this strawberry on the market? Why?



Mr. R wants to continue his work on people. It is seen that people have experienced various tissue, organ losses throughout their lives and that people lost their lives since these tissues, and organs cannot be found afterwards. Knowing that even if a donor is found, the patient's body may not accept the given tissue or organ and that the person's life is in danger, Mr. R thinks why not a replica of the human being either. According to him, a clone of Dolly, who was a sheep before, was made, so man can be made too! Studying the laws on this subject, Mr. R finds that making a human clone is strictly prohibited due to moral values. But the crazy inventor, who takes the certainty that humanity will need cloning for organ needs in the future, wanted to live in those times. Mr. R, who is 45 years old, realizes that he cannot see those days under normal circumstances and immediately gets to work. He prepares and drinks a potion that will awaken him in 2100.

Years pass and Mr. R opens his eyes in the year 2100. Indeed, people can now be cloned and take the necessary organs from their clones when their organs are not functioning. However, Mr. R also faced a situation he had not expected. Because there are individuals with the same genome in the society, he has seen that when a crime is committed, it is not possible to find clear information about whether the truth or the clone did it. He observed that individuals with the same DNA fingerprints feel comfortable by sharing tasks in their work and social lives, and can increase their chances of survival by using the organs of their clones in disease situations, and they create various social problems in order to be individualized. Given these circumstances, Mr. R remained undecided about whether the morally prohibited human clone around 80 years ago had a positive outcome in 2100.

2. If you were Mr. R's place, would you have developed a positive or negative attitude towards human cloning? Do you think human cloning is possible? Do you find this right? Why? Explain.

The pictures used in the scenario are retrieved from the following addresses;

1. https://www.kentharita.com/genetik-muhendisligi-nedir/

2.https://www.express.co.uk/news/science/660058/Top-scientist-warns-thatcloning-could-lead-to-ILLEGAL-black-market on 12 November 2018.

Appendix 2

Interview Questions Used in the Research

1. Have you ever taught in any lesson using the same method that the 'DNA and Genetic Code' unit was taught?

2. Do you think that the course in the 'DNA and Genetic Code' unit of the Science course through such scientific scenarios has an impact on your success? Why?

3. Do you think that the way the lesson is taught in the 'Science and Genetic Code' unit with scientific scenarios helps you to establish a relationship between the science subjects you learn in the unit and daily life? How? Can you explain with an example?

4. Do you think that the teaching of the courses in the 'DNA and Genetic Code' unit of the Science course in this way - through scientific scenarios- affects your perspective / awareness of social problems? Why?

5. In the 'DNA and Genetic Code' unit of the 'Science course', were there any problems and difficulties that you saw lacking in the process of teaching the courses in this way - through scientific scenarios? If yes, could you please explain what happened?

6. If you wanted to make changes in the application / study, what would you continue and change? Can you explain why?

BARÜ Bartın University Journal of Faculty of Education BUEFAD

2023, Volume 12, Issue 1, 146-166
dergipark.org.tr/buefad
DOI: 10.14686/buefad.996949

Comparison of the Methods of Examining Measurement Equivalence Under Different Conditions in Terms of Statistical Power Ratios

Research Article
Received: 17.09.2021
Revised: 15.12.2021
Accepted: 16.12.2021

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ABSTRACT

Validity is the most important psychometric feature that should be found in a measurement tool. Measurement equivalence is one of the evidences for the validity of measurement tools. Providing information to the researchers about the methods of identifying measurement equivalence may contribute to present a complete validity evidence. The purpose of this study is to compare the statistical power ratios of methods used for examining the measurement equivalence based on structural equation modeling and item response theory on the simulation data sets simulated by diversifying conditions of sample size, number of items, and the ratios of the items having differential item function. In accordance with this purpose, the conditions have been manipulated to include three different levels. In the analysis, multi-group confirmatory factor analysis was used which is among the methods based on the structural equation modeling, and likelihood ratio test and comparison of the item parameters methods were used which are among the methods based on item response theory. Multi-group group confirmatory factor analysis (93,50%) and likelihood ratio test (96,75%) methods have reached the highest statistical power ratio in the condition that the sample size is 1000/1000, the number of items is 40 items and the ratios of the items having differential item function is 10%. The method of comparing the item parameters (94,50%) has reached the highest statistical power ratio in the condition of sample size is 1000/1000, the number of items is 20 and the ratios of the items having differential item function are 10-20%.

Keywords: Measurement equivalence, invariance, differential item function, statistical power ratios, multi-group confirmatory factor analysis, likelihood ratio test, comparison of the item parameters method.

Ölçme Eşdeğerliğini İncelemede Kullanılan Yöntemlerin Farklı Koşullar Altında İstatistiksel Güç Oranları Açısından Karşılaştırılması

ÖZ

Geçerlilik, bir ölçme aracında bulunması gereken en önemli psikometrik özelliktir. Ölçme eşdeğerliği, ölçme araçlarının geçerliliğinin kanıtlarından biridir. Araştırmacılara ölçme eşdeğerliğini belirleme yöntemleri hakkında bilgi verilmesi, tam bir geçerlilik kanıtı sunulmasına katkı sağlayabilir. Bu çalışmanın amacı, yapısal eşitlik modellemesi ve madde tepki kuramına dayalı ölçme eşdeğerliğini incelemek için kullanılan yöntemlerin istatistiksel güç oranlarını, örneklem büyüklüğü, madde sayısı ve değişen madde fonksiyonu içeren madde oranı değişkenleri değişimlenerek oluşturulan yapay veri setleri üzerinde karşılaştırmaktır. Bu amaç doğrultusunda değişkenler üç farklı düzeyi olacak şekilde değişimlenmiştir. Analizde yapısal eşitlik modellemesine dayalı yöntemlerden çok gruplu doğrulayıcı faktör analizi, madde yanıt teorisine dayalı yöntemlerden olabilirlik oranı testi ve madde parametrelerinin karşılaştırılması yöntemleri kullanılmıştır. Örneklem büyüklüğü 1000/1000, madde sayısının 40 olduğu ve değişen madde fonksiyonuna sahip maddelerin oranları ise %10 koşulda çok gruplu grup doğrulayıcı faktör analizi (%93,50) ve olabilirlik oran testi (%96,75) yöntemleri en yüksek istatistiksel güç oranına ulaşmıştır. Madde parametrelerinin karşılaştırılması yöntemi (%94,50) örneklem büyüklüğünün 1000/1000 olması, madde sayısının 20 olması ve diferansiyel madde fonksiyonuna sahip maddelerin oranlarının 10-20% olması durumunda en yüksek istatistiksel güce ulaşmıştır.

Anahtar kelimeler: Ölçüm eşdeğerliği, istatistiksel güç oranları, çoklu grup doğrulayıcı faktör analizi, olabilirlik oranı testi, madde parametrelerinin karşılaştırılması yöntemi.

To cite this article in APA Style:
Yandı, A. & Koç, N. (2023). Comparison of the methods of examining measurement equivalence under different conditions in terms of statistical power ratios. *Bartın University Journal of Faculty of Education, 12*(1), 146-166. https://doi.org/10.14686/buefad.996949

INTRODUCTION

Identification of individual differences is one of the main objectives of the studies carried out in the field of social sciences. Individuals differ depending on the structures like environment and culture. The identification of the results obtained for individual differences is the basis of the arrangements and changes made in different fields. Environments of education, business and so on. redesigning, taking decisions at individual and group levels, and performing certain actions according to these decisions are an example of these arrangements and changes. Individual differences need to be measured accurately, therefore these arrangements and changes can be efficient. In other words, one of the most important phases in the process of the identifying the individual differences is the measurement process (Tekin, 1991). Indeed, Galton (1884) tried to identify the differences between individuals by considering several variables, and he emphasized the importance of mensuration in this process.

One of the fields in which arrangements and changes are made in line with the results of individual differences is educational sciences. Individuals' level of having psychological constructs is, also, frequently discussed in educational sciences. Since it is much more difficult to observe the psychological structures directly in this process, measurement tools are used to determine the reactions from which we can predict these psychological structures (Erkuş, 2012). Using development and adaptation studies measurement tools are introduced to the literature. The psychometric properties of the measurement tools must be adequate. Validity is the determination of the extent to which theoretical and empirical evidence is supported by interpretations based on the scores obtained in the test applications (Messick, 1989). For this reason, validity examination of the measurement tools used in researches gain more importance.

The reason for the significance of validity tests in the research process is its direct effect on the accuracy of the results. Researchers need to be cautious at some points about the validity examination. The first of these points is at which stage of the research the test of validity should be carried. Validity examination should not be carried out after the final application. It is because the researcher does not have a chance to plan on the measurement tool after the final application (Ellis & Mead, 1998). Another point that should be taken into consideration is the analysis carried out during the examination process. In most studies it is seen that certain analyses have been used in the validity examination process. When identifying validity analyses, the purpose of the study should be considered. Systematic error sources are checked during the validation examination process. The sources of systematic errors that may affect with a measurement application may differentiate. For this reason, it should be tried to predict possible sources of systematic errors according to the purpose of the research.

In a major part of the researches aimed at identifying individual differences, comparisons are made between the groups in which the individuals get involved in accordance with the variables such as gender, grade and age. In researches with this purpose, individuals in different subgroups are compared. One of the sources of systematic error that can be encountered in these researches is bias. The bias is one of the most important systematic error sources that adversely affect validity (Messick, 1995). It is expected that the individuals who are at the same level in terms of the psychological structure being measured respond at the same response level. Bias can be defined as the differentiation of the probability of individuals giving the same response (Angoff, 1993).

Types of bias that can be encountered during the measurement processes can differentiate. The concept of bias is divided into three headings as construct, method and item bias (Van de Vijver, 1998). While method and construct bias can be identified by theoretical research, item bias could be diagnosed with the help of the item response functions. One of the concepts addressed in the examination process of item bias is the measurement equivalence. Measurement equivalence can be defined as a situation in which the individuals who are at the same level in terms of latent variable but in different subgroups regarding any other variable respond to the observed variable at the same level. (Drasgow & Kanfer, 1985; Widaman & Reise, 1997).

In researches conducted in different subgroups, it is necessary to provide measurement equivalence therefore comparisons between groups can be made correctly (Reise, Widaman & Pugh, 1993; Vandenberg & Lance, 2000). However, it is seen that examination of measurement equivalence is neglected in researches in national literature on different group comparisons (Başusta & Gelbal, 2015). It can be said that the complexity of the measurement equivalence examination process, and the applications of the methods used in this process lead to this situation. For this reason, the researches about the measurement equivalence examination process are important in terms of providing information to the researchers about the use different methods by comparing applications. The researchers can be informed by clarifying the application process of measurement equivalence examination methods. This can contribute to the implementations of the measurement equivalence examination, one of the most important evidence of validity.

The methods based on the Item Response Theory (IRT) and Structural Equation Modelling (SEM) for testing measurement equivalence are priorities. In addition, latent variable models may be preferred depending on the variable properties (Güngör Culha, 2012). The researchers carry out the analyses by using the Multiple Group Confirmatory Factor Analysis (MGCFA) method based on SEM. Multi-group confirmatory factor analysis allows the analysis, based on mean-covariance structures and covariance structure, to be carried on. Some of the methods found under the IRT can be listed as Comparison of Item Parameters (CIP), Raju's Area Index, Lord's Chi-Square and Likelihood Ratio Test (LRT) (Embretson & Reise, 2000; Hambleton et al., 1991). In addition to these methods, the alligment method (Asparouhov & Muthén, 2014), which provides information about the level of measurement invariance along with the factor mean and variance between groups, and which stands out with the possibility of predicting the most appropriate models for a large number of groups, is also used in measurement equivalence examinations (Sırgancı, Uyumaz & Yandı, 2020).

Simultaneous testing of the equivalence of measurement and structural models is one of the purposes of the confirmatory factor analysis (CFA) method, one of the SEN-based methods (Asil, 2010). Equivalence of mean and covariance structures are examined in the analyses performed in the CFA process. It is suggested that covariance and mean structures are added together in models (Little, 1997; Meredith, 1993). For this reason, it is necessary to distinguish between models which deal with these two structures together and which deal only with covariance structures. The mathematical representation (Equation.1) of the covariance-based factor analytical model in multi-group confirmatory factor analysis is as follows:

$$Yil = \lambda 1\eta 1 + \lambda 2\ \eta 2 + \ldots + \lambda jm\ \eta mi + \varepsilon ji \qquad \text{(Equation.1)}$$

In this equation Yil represents the observed score of the ith person for lth item. The regression coefficients or the factor loadings of item j in the factor m, one or more factors and the random error terms having normal distribution, denote λim, ωmi, εji, respectively. In the other model, the mean values of the observed variables are also included in the model (Somer, Korkmaz, Dural & Can, 2009; Wu, Li & Zumbo, 2007). The mathematical representation (Equation.2) of the factor analytic model of this model is as follows:

$$Yil = Ʇj + \lambda 1(\alpha 1 + \eta 1) + \lambda 2\ (\alpha 2 + \eta 2) + \ldots + \lambda jm(\alpha m + \eta mi) + \varepsilon ji \qquad \text{(Equation.2)}$$

In this equation, unlike covariance-based multi-group confirmatory factor analysis, the factor means, denoted by αm and the intercept of item i denoted by Ʇj are in this model. Through covariance based multiple group confirmatory factor analysis, researchers can examine equivalence of factor loadings, factor variance and covariance structures and error variances; in addition to that can examine equivalence of latent variable mean and intercepts with mean-covariance based model.

In the likelihood ratio test (Thissen, Steinberg & Gerrard, 1986), the inclusion of a differential item function (DIF) in an item is identified by comparing the likelihood ratios calculated for the two models, termed as the compact and augmented model. The parameters of item that can have DIF are released in the augmented model and calculated. In the compact model, the parameters of all the items are set to be fixed in the comparison groups. By examining the difference between the calculated 2 log likelihoods (-2 ll) for the compact and augmented modes, the item having DIF released in augmented model is interpreted. The difference between the models in the process is defined as the G2 statistic. The formula (Equation.3) used for the G2 statistic is as follows:

$$G2 = -2\ (ll_{\text{compact model}} - ll_{\text{augmentedmodel}}) \qquad \text{(Equation.3)}$$

The G2 value calculated by this formula is compared with the critical value $\chi 2$ in the degree of freedom, which is equal to the difference in the number of parameters between the two models (Thissen, Steinberg & Wainer, 1993), and examine whether the difference between the model fit statistics is significant. The fact that the difference obtained is indicative of the DIF of the released item in the augmented model.

Comparison of item parameters method which examines the parameter differences estimated for comparison groups was developed by Bock, Muraki and Pfeiffenberger (1988). In this method, analyses are performed based on the differences between the item discrimination; and item difficulty parameters were estimated for the comparison groups (Morales, Reise & Hays, 2000; Reise, Smith & Furr, 2001). Unlike other DIF identification methods, the location parameter is included in the models of this method. By using the differences between the item parameters in the analysis process, the differential item function statistic (DIFS) is calculated. The formulas used in the statistical calculation (Equation.4 and Equation.5) of differential item function are as follows (Bock et al., 1988; Morales et al., 2000; Reise et al., 2001):

$$\text{Differential item function Statistic} = \hat{a}i_{(\text{reference})} - \hat{a}i_{(\text{focal})} \qquad \text{(Equation.4)}$$

Differential item function Statistic = b î(reference) -b î(focal) (Equation.5)

The DIFS calculated gets standardized according to the following formula (Equation.6 and Equation.7) (Muraki & Engelhard, 1989, In Thissen et al., 1993: 84).

Standardized Differential item function Statistic (SDIF)= DIFSa/(√(varâi(referreference)+varâi(focal))) (Equation.6)

Standardized Differential item function Statistic = DIFSb/(√(varb î(reference)+varb î(focal))) (Equation.7)

Square of the standardized differential item function statistic of each item is compared with the critical value of $\chi 2$ in one degree of freedom (Thissen et al., 1986). In this comparison, the interpretation is made as containing differential item function for the items with having SDIF is greater than the criterion $\chi 2$. If SDIF has a positive value, it is an advantage for the focus group; an advantage is given in favour of the reference group if it has a negative value.

In researches aiming to compare methods, it is important to clearly indicate in which direction the methods are compared to provide accurate information. The methods investigated in the scope of this research will be compared in terms of statistical power. The statistical power ratio in the analysis process of this research is defined as the rate of correct detection of the items containing DIF in the simulation data sets. The statistical power ratio is called "true positive" in the studies comparing measurement equivalence identification methods based on SEM and IRT and is explained in the way defined in this study (Kim & Yoon, 2011; Meade & Lautenschlager, 2004; Stark, Chernyshenko & Drasgow, 2006).

The methods compared in this study are mean-covariance based multi-group confirmatory factor analysis from SEM-based methods and comparison of item parameters method and likelihood ratio test from IRT-based methods. Providing information to researchers about methods based on different theories and making contribution to researchers about validity examination processes with the help of information provided about different methods are the reasons of the preference of these methods. In addition, multi-group confirmatory factor analysis was considered in the scope of the research because SEM-based methods were not tested on simulation data sets having different conditions.

When the literature was examined, it was determined that the statistical power and Type 1 error rates of IRT and SEM-based methods in determining DIF were discussed in different studies (Ankenmann, Witt & Dunbar,1999; Flowers, Raju & Oshima, 2002; Meade & Lautenschlager, 2004; Stark et al. ., 2006; González Roma, Hernandez & Gomez Benito, 2006; Atar & Kamata, 2011; Kim & Yoon, 2011; Kankaras, Vermunt & Moors, 2011; Elosua & Wells, 2013). The performances of the likelihood ratio test and multi-group confirmatory factor analysis methods were compared in these studies. In most of the studies, the sample sizes, and the magnitude of DIF were manipulated. It has been determined that very few studies deal with ability distributions, pattern, and DIF Type, number of items and scoring system of the measurement tool. From this point of view, the likelihood ratio test and multiple group confirmatory factor analysis methods were used in this study. In addition to these methods, comparison of the item parameters method, which is easier to apply, is also used The conditions of ratio of item having DIF, which was less discussed in the studies, was included in the study as a simulation condition. In addition, the condition of the number of items is another condition that changed in the study. Considering the real application conditions, it is possible to encounter the simulation of the number of items in the measurement tools that can be used. It is thought that the inclusion of these two conditions in the study will provide new information to the researchers. In addition, presenting results regarding comparison of the item parameters method, which is a highly useful method, will enable researchers to obtain information about this method and to obtain evidence regarding the performance of this method under different conditions.

In summary, when the literature was evaluated, it was seen that different conditions were manipulated and different methods were tried in the process of determining measurement equivalence. In addition, it has been determined that the findings in the studies and the conditions examined vary. In this study, different conditions were manipulated based on the literature and CFA and IRT based methods were compared. The general purpose of this research is to compare measurement equivalence identification methods that can be used for multiple scored data under different conditions. For this purpose, evidence has been found that the most appropriate measurement equivalence identification method for different conditions that may be encountered in real applications. Results obtained for identification of measurement equivalence by perform MGCFA, CIP and LRT on multiple scored simulation data sets simulated with manipulating conditions of sample size, number of items, and ratios of items having DIF were compared. For this purpose, the following questions were answered in the survey:

1. How do the statistical power ratios in the measurement equivalence analyses with

a. Multi group confirmatory factor analysis,

b. Likelihood ratio test,

c. Comparison of item parameters

on the simulation data sets with the conditions of different sample sizes, different number of items, and different ratios of items having DIF differ?

2. What kind of differentiation arises when the statistical power ratios of the three methods used are compared?

METHOD

Research Design

In this study, it is aimed to compare the statistical power ratios of measurement equivalence testing methods on simulation data sets simulated in different conditions and to provide the researchers with information about measurement equivalence process. The research is basic research in that it offers contribution to the theoretical studies. Karasar (2005) stated that the main purpose of the basic researches is to "bring up to date to existing information".

Generating The Data Sets

In this section, the characteristics of the simulation data sets used in the research are explained. The simulation data sets were simulated by manipulating the conditions identified within the scope of the research. Some conditions are fixed for subgroups. 100 replications were made for all data sets. Table 1 shows the conditions manipulated and fixed.

Table 1. Conditions used in the simulation data sets generation process.

Manipulated conditions	Fixed conditons
Sample size	Number of response category
Number of items	Item Response Theory Model
Ratios of item having DIF	DIF Type
	Magnitude of DIF
	Ability distribution of individuals
	Number of groups (2 subgroup)

Manipulated conditions

The manipulated conditions for datasets, such as sample size, number of items, and ratios of item having DIF are explained in this section. Each condition is split into three sub-categories. Therefore, in the data sets, 27 (3x3x3) conditions were consisted of.

Sample Size

In studies conducted using measurement equivalence methods, it has been indicated that sample sizes are in the range of 400-2000 (Atalay, Gök, Kelecioğlu & Arsan, 2012; Bolt, 2002; Holmes Finch & French, 2007; Huang, Church & Katigbak, 1997; Kazelskis, Thames & Reeves, 2004; Kim & Cohen, 1998; Korkmaz, 2005; Nachtigall, Kroehne, Funke & Steyer, 2003; Narayanan & Swaminathan, 1994; Reise, Wideman & Pugh, 1993; Somer et al., 2009; Somer, 2004). Considering these results in the literature and actual application conditions, in this study the sample size variable manipulated as 500 (250/250), 1000 (500/500) and 2000 (1000/1000).

Number of items

The number of items is discussed as another variable influencing the methods used in the measurement equivalence identification researches. In studies conducted using actual or simulation data sets that can be accessed in the literature, it is seen that the item numbers change between 6 and 180 items (Clauser & Mazor, 1998; Dodeen, 2004; Kazelskis et al., 2004; Korkmaz, 2005; Atalay et al., 2012). In the studies, it is observed that the number of items variables differ in a wide range. It has been regarded as a necessity to manipulate this variable in this study due to the effect of the number of items variable on the statistical power of the methods to identify measurement equivalence and the use of measurement tools consisting of items at different numbers in actual applications. In this study, simulation data sets of 20, 40 and 60 items were produced in order to correspond with the conditions that may be encountered in actual applications.

Ratios of items having DIF

The items having DIF affect the validity of the test negatively, because DIF is a source of bias (Camilli & Shepard, 1994). In addition, the items having DIF negatively affect the power of the methods used in the DIF analysis (Fidalgo, Mellenbergh & Muniz, 2000; Wang & Yeh, 2003; Holmes Finch & French, 2007; Atalay et al., 2012). When the studies are examined, it is seen that the ratios of the items having DIF are in the range of 0% and 40% in simulation data sets studies (Rogers & Swaminathan, 1993; Narayanan & Swaminathan, 1994; Fidalgo et al., 2000; Holmes Finch & French, 2007). In line with this information, for the simulation data sets simulated in this study, ratios of the items having DIF have been manipulated at ratios of 10%, 20% and 30%. According to these proportions, each data set contains different number of items having DIF belong to number of total items. The items having DIF are in the first part of the data sets. For 10%, 20% and 30% ratios, first 2, first 4 and first 6 items in data sets consisting of 20 items; first 4, first 8, and first 12 items in the data sets consisting of 40 items; first 6, first 12 and first 18 items in the data sets consisting of 60 items have DIF respectively.

The aim of this study is to examine the statistical power of the DIF analysis method based different theoretical models. The definition of the statistical power in this study is the rate of correct detection of the items containing DIF in the simulation data sets. Because of this definition, the no DIF items were not included in the data sets. No DIF items can be included in the studies which aimed to examine type I error. A Type I error is the incorrect rejection of a true null hypothesis. If the DIF detection methods describe DIF on the no DIF items, type I error can be examined.

Variables of fixed

The statements about the variables that are fixed in data sets appear in this section. The fixed variables are number of response category, Item Response Theory Model , the DIF Type, magnitude of DIF and ability distribution of individuals.

Number of response category

In this study, the data sets have the items including five-responding category It has been decided that at least four of the responding category numbers are taken in simulation data sets (Dodeen, 2004; Garrett, 2009; Bilican Demir, 2014). Also, the scales having the five-response category were commonly applied in the researches. Therefore, five-response category is selected for the adaptation of the real application

Item Response Theory Model

Samejima's (1969) Graded Response Model was used to simulate response patterns in simulation data sets. This model is preferred because it has mathematical models for ordinal and multiple scores, therefore it is suitable for measuring the characteristics that can be measured with multiple scoring such as performance and attitude (Samejima, 1997).

DIF Type

In a Graded Response Model, items may differ in terms of threshold and discriminant parameters in the subgroups. In this case, a uniform and non-uniform differential item function can occur for the items. In this study, cases were used items having uniform DIF. Therefore analyses are performed only on the cases where the items differ only in terms of threshold parameters.

Magnitude of DIF

In this study, the change between the parameters of 0.49 logit units identified by the Educational Testing Service for the moderate change level was taken as the quantity of the DIF.

Ability distribution of individuals

Roussos and Stout (1996) and Tian (1999) emphasized that the difference between 0.50 and 1.00 standard deviations between groups' ability distribution averages is close to real applications, based on real test applications and expert opinion. In this study, the ability distributions of the subgroups were limited to the ability distributions (N (0, 1)) with a mean of 0.00 and a unit normal distribution characteristic of 1.00 standard deviations.

Analysis of Data Sets

The analysis was carried out on the simulation data sets simulated different conditions by using multi-group confirmatory factor analysis method based on SEM, likelihood ratio method and comparison of item parameters methods based on IRT.

In this study, measurement equivalence analysis was carried out for the MGCFA method by following the stepwise test method suggested by Meredith (1993) Suggested steps for testing the measurement equivalence are:

- Configural invariance: The basic step in testing the measurement equivalence. At this step, it is examined whether the measurement tools applied to different groups have the same factor structure in each group.
- Metric invariance: In the step of metric invariance, the factorial loadings (λ) of the items in the measurement tool are tested for equivalence in the groups being measured (Vandenberg & Lance, 2000).
- Scalar invariance: In the step of scalar invariance, the regression intercepts are fixed for different groups in addition to the factor structure in the step of configural invariance and the factor loadings in the step of metric invariance (Brown, 2015; Hong, Malik & Lee., 2003).
- Strict invariance: After the steps of configural, metric and scalar invariance are confirmed, the error terms (ε) related to the items are fixed in final step. It is checked whether the observed variables have the same amount of error terms in the groups participating in the measurement application in the step of strict invariance.

In MGCFA performed by using LISREL 8.72 program. In the analysis process, maximum likelihood estimation was used because all data sets were produced correspondent with normal distribution. And in all steps, covariance matrixes were used in the analysis due to same reason (Jöreskog and Sörbom, 1999).

MULTILOG 7.03 (Thissen, 1991) program was used in the analysis of likelihood ratio test. The data sets simulated for each condition was adapted to the analysis and the program as a format. For each data sets in folders, the compact model syntax file is written first. Then, the augment model syntax files are prepared for each item. Results were obtained by running the syntax files for the data sets in each folder. The -2 loglikelihood values were deduced from each analysis obtained. Then the differences between these values for each data set is calculated by using the excel program. Whether or not the item has a differential item function has been identified by comparing these differences with critical $\chi 2$ value for degrees of freedom specified.

In the analysis process, comparison of the item parameters method was carried out by using the PARSCALE 4.1 program (Muraki & Bock, 1991). The data sets simulated for each condition was adapted to the analysis and the program as a format as such in LRT analysis. One syntax file has been created for each of the data sets. The outputs of the analysis are organized. And then tables are created to indicate the significance of the difference of each item parameter were taken. By using the Excel program, the items in which the difference of parameters are significant are identified in these tables and decided for the items whether having DIF or not.

Research Ethics

The research was carried out on simulative data; it does not contain any application made on individuals in any way.

FINDINGS

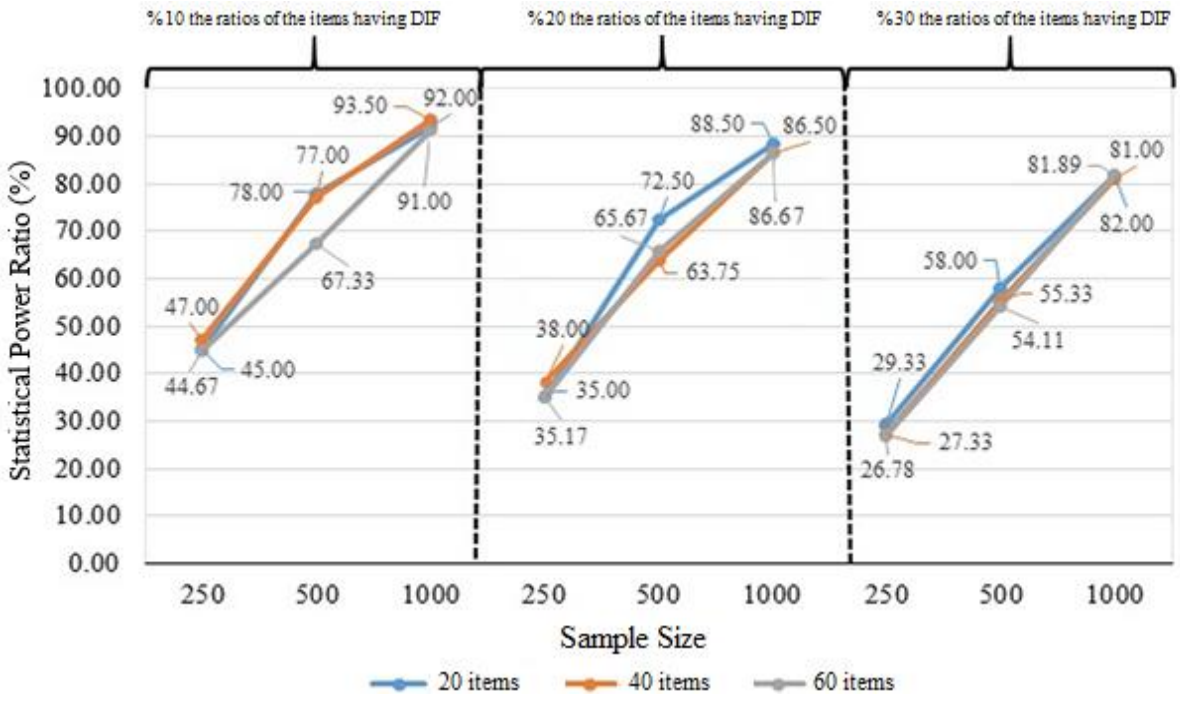
In this section, the results of the analysis are presented with graphics. Tables related to the analysis results are in the appendices. Graphics are preferred in the text therefore the results can be explained simply and clearly.

Findings Related To Statistical Power Ratios of MGCFA

The findings and interpretations of the statistical power ratios obtained from the analysis carried out by MGCFA are included below this title. The statistical power ratios of the MGCFA are given in Appendix 1.

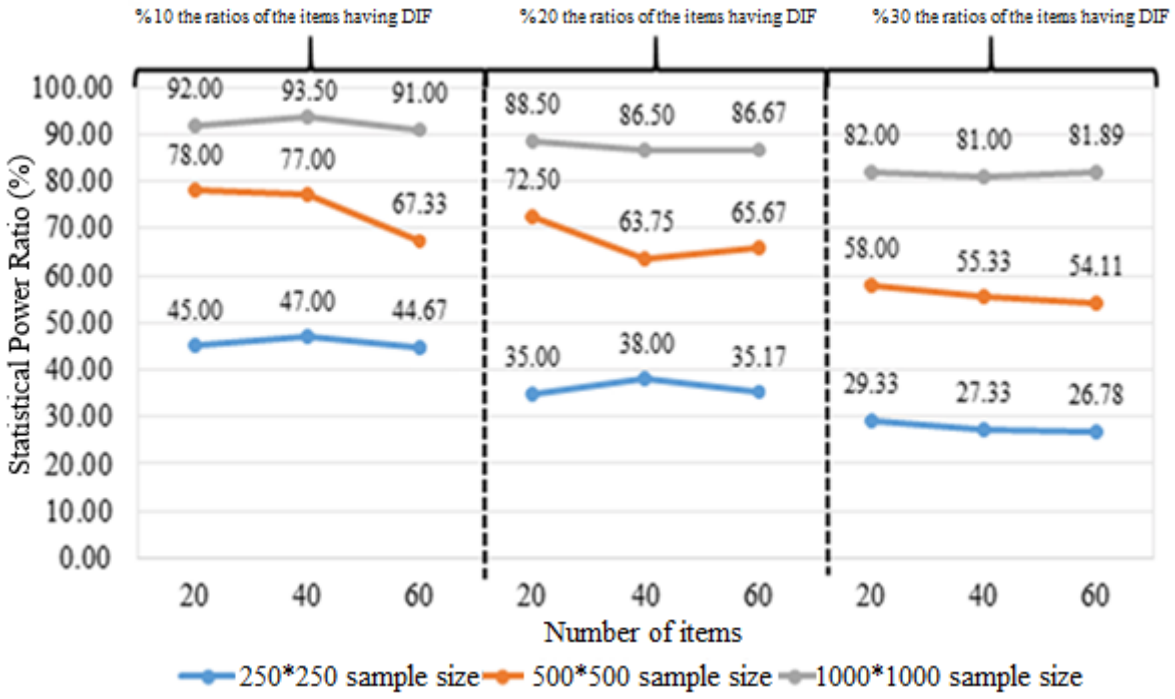
According to Appendix 1, statistical power ratios of MGCFA are in the range of 26.78% and 93.50%. The lowest power ratio for this method was calculated when the focus and reference group sample size was 250, the number of items was 60, and the ratios of the items having DIF was 30%. The highest statistical power ratio was calculated for the condition that the focus and reference group sample size was 1000, the number of items was 40, and the ratios of the items having DIF was 10%.

The results of the change in the statistical power ratios according to the sample size variable are presented in Graph 1.



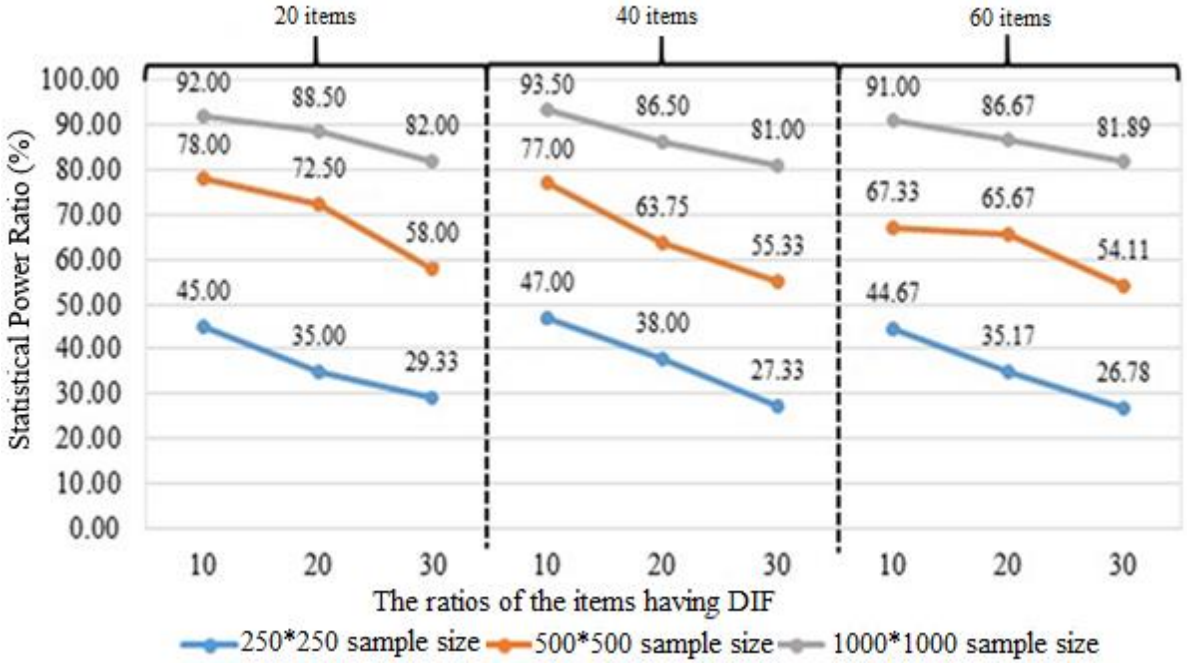
Graph 1. *Statistical power ratios for variable of sample size (MGCFA).*

According to the findings presented in Graph 1, the statistical power ratios obtained for the MGCFA increase belong to increment of the sample size at all levels of the variable number of items and ratios of the items having DIF. The results obtained for viewing the change in the statistical power ratios according to the item number variable are presented in Graph 2.



Graph 2. *Statistical power ratios for variable of number of items (MGCFA).*

According to the findings presented in Graph 2, the statistical power ratios of MGCFA decrease in low amounts depending on the number of items. The results presented in Graph 3 are used to illustrate the statistical power ratios given in Appendix 1 for variable of the ratios of the items having DIF.



Graph 3. *Statistical power ratios for variable of the ratios of the items having DIF (MGCFA).*

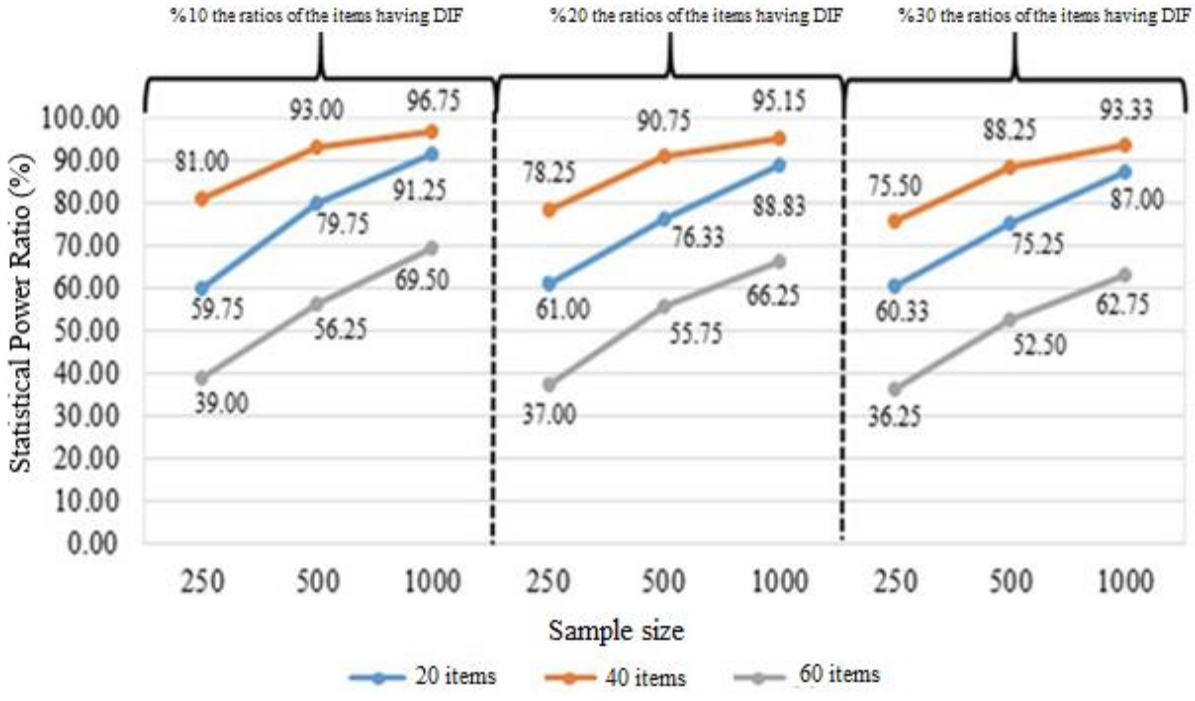
The statistical power ratios of the MGCFA are reduced by increasing the variable of ratios of the items having DIF according to the values presented in Graph 3.

Findings Related to Statistical Power Ratios Of LRT

Findings and interpretations on the statistical power ratios obtained by the analysis of the likelihood ratio test are included below this title. The statistical power ratios of the multiple LRT are given in Appendix 2.

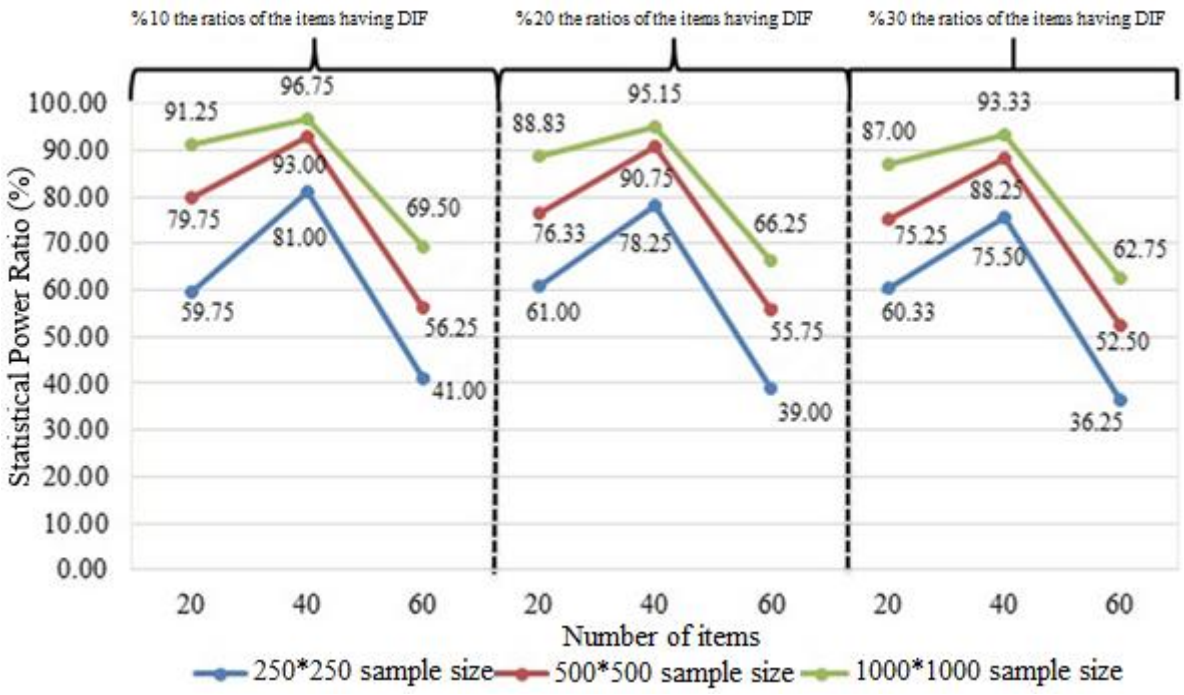
The results presented in Appendix 2 indicate that the likelihood ratio test statistical power ratios are in the range of 36.25% and 96.75%. The lowest power ratio for this method was obtained when the focus and reference group sample size were 250, the number of items was 60, and the ratios of the items having DIF was 30%. The highest statistical power ratio is calculated for the condition that the focus and reference group sample size was 1000, the number of items was 40, and the ratios of the items having DIF was 10% as is the case with MGCFA.

The results are presented in Graph 4 therefore the change in the statistical power ratios can be seen according to the sample size variable clearly.Findings section can include the description of your statistics or findings.



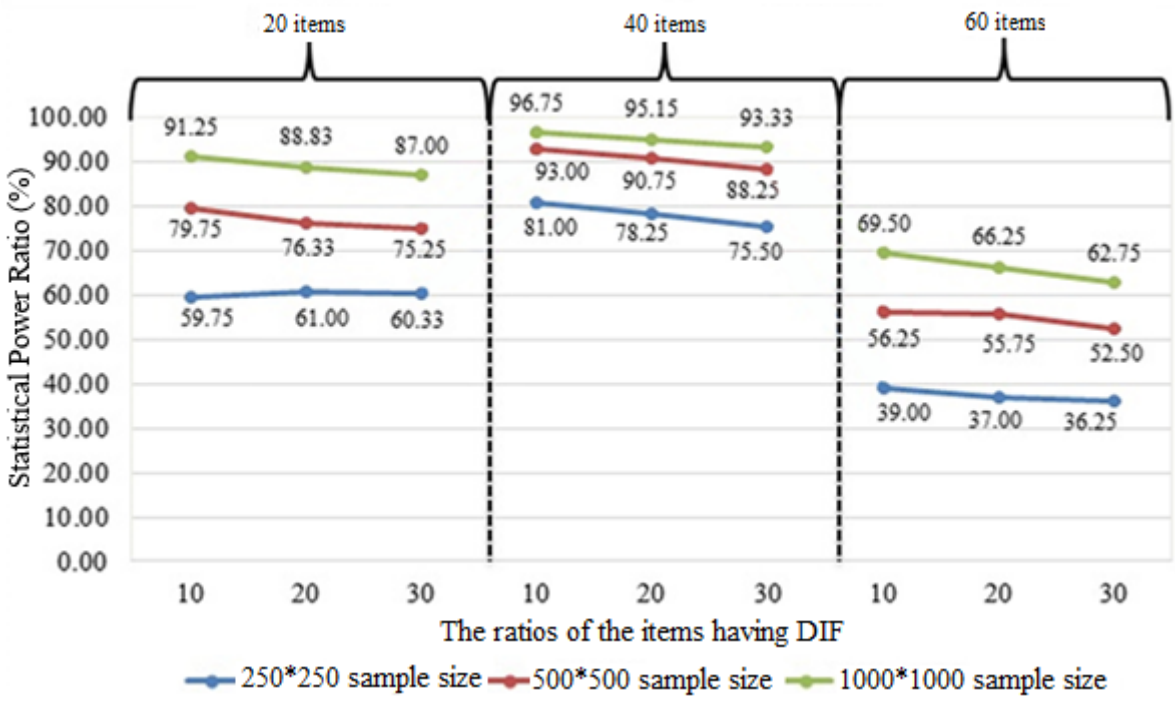
Graph 4. *Statistical power ratios for variable of sample size (LRT).*

When the curve in Graph 4 is examined, it is seen that the statistical power ratios obtained for the LRT increase due to increment of the sample size. The statistical power ratios obtained for the variable of number of items in the analyses by using the likelihood ratio test are given in Graph 5.



Graph 5. *Statistical power ratios for variable of number of items (LRT).*

The findings presented in Figure 5 indicate that high statistical power ratios for 40-item data sets are available for LRT. In other words, it reveals that the number of the ideal number of items for LRT is 40 for the data sets simulated in this study. The statistical power ratios for the variable rate of the items having DIF are given in Graph 6.



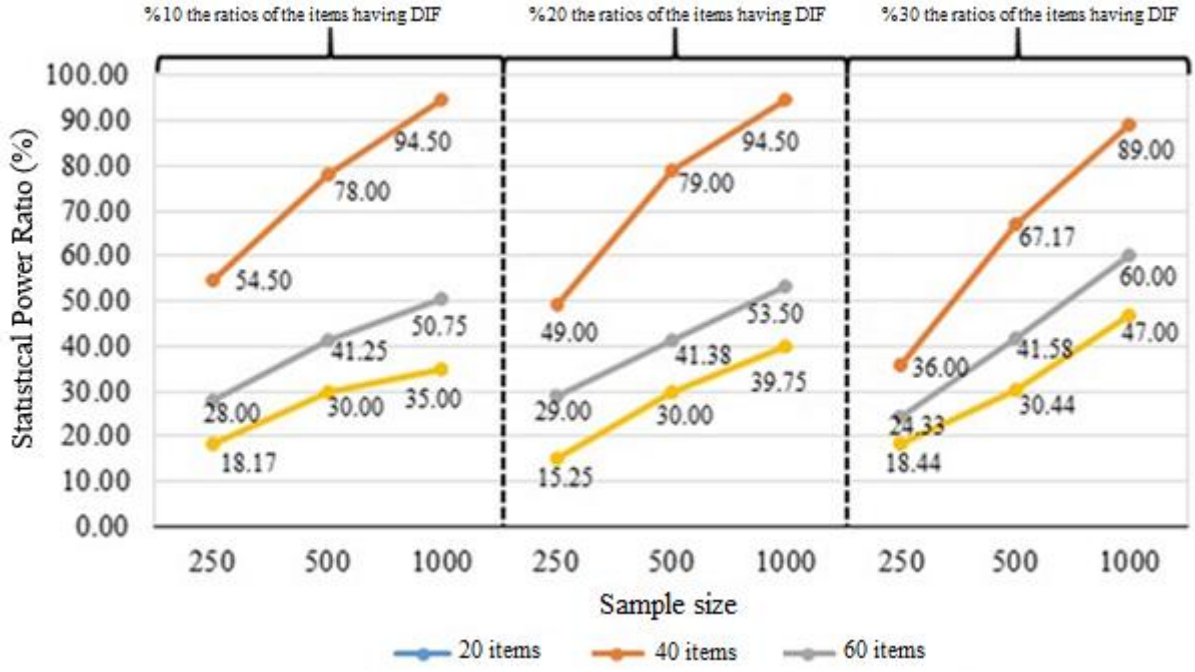
Graph 6. *Statistical power ratios for variable of the ratios of the items having DIF (LRT).*

When Graph 6 is examined, increment of the ratios of the items having DIF causes to a slight decrease on the statistical power of LRT. However, this is not valid for every condition presented in Graph 6 where it could be seen in the data sets having 250*250 sample size and consisting of 20 items.

3.3. Findings related to statistical power ratios of CIP

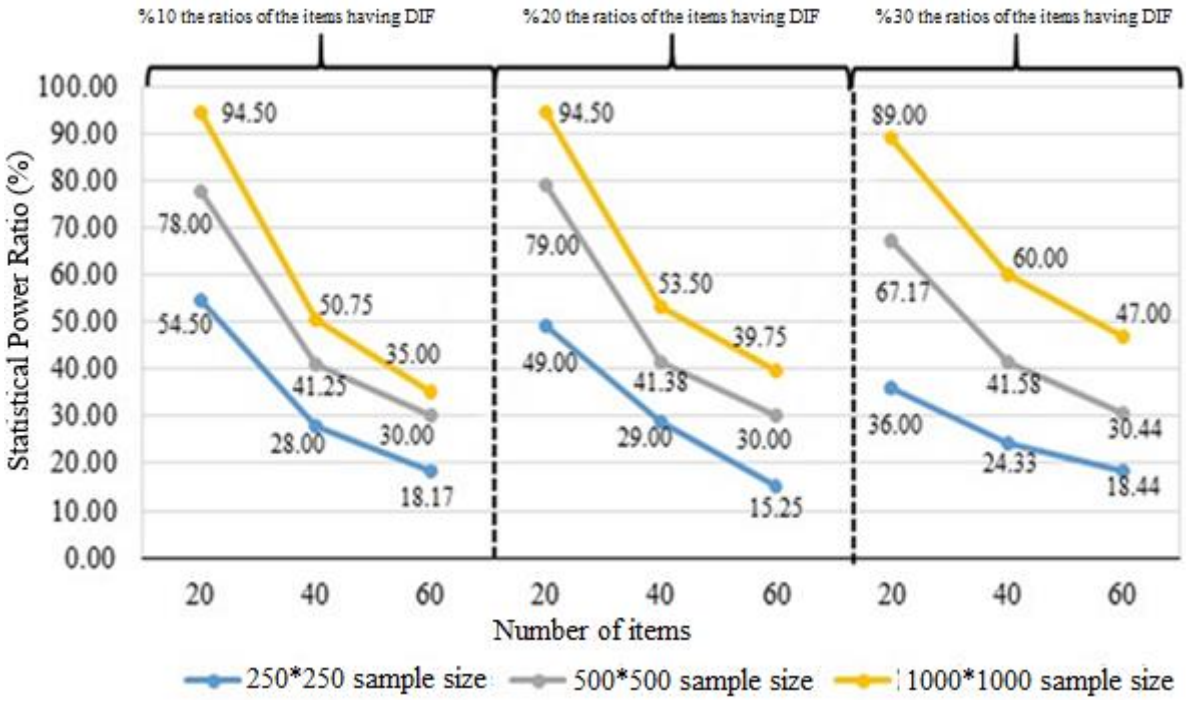
In this section, findings and interpretations related to the statistical power ratios obtained in the analyses made by CIP are given. The statistical power ratios of the method of item interpretation parameters are given in Appendix 3.

The results presented in Appendix 3 show that the likelihood ratio test's statistical power ratios are in the range of 15.25% and 94.50%. The lowest power ratio for this method was obtained when the focus and reference group sample size was 250, the number of items was 60, and the ratios of the items having DIF was 20%. The condition where the highest statistical power ratio is calculated is that the focus and reference group sample size is 1000, the number of items is 20 and the ratios of the items having DIF are 10 and 20%. The statistical power ratios for the sample size variable are given in Graph 7.



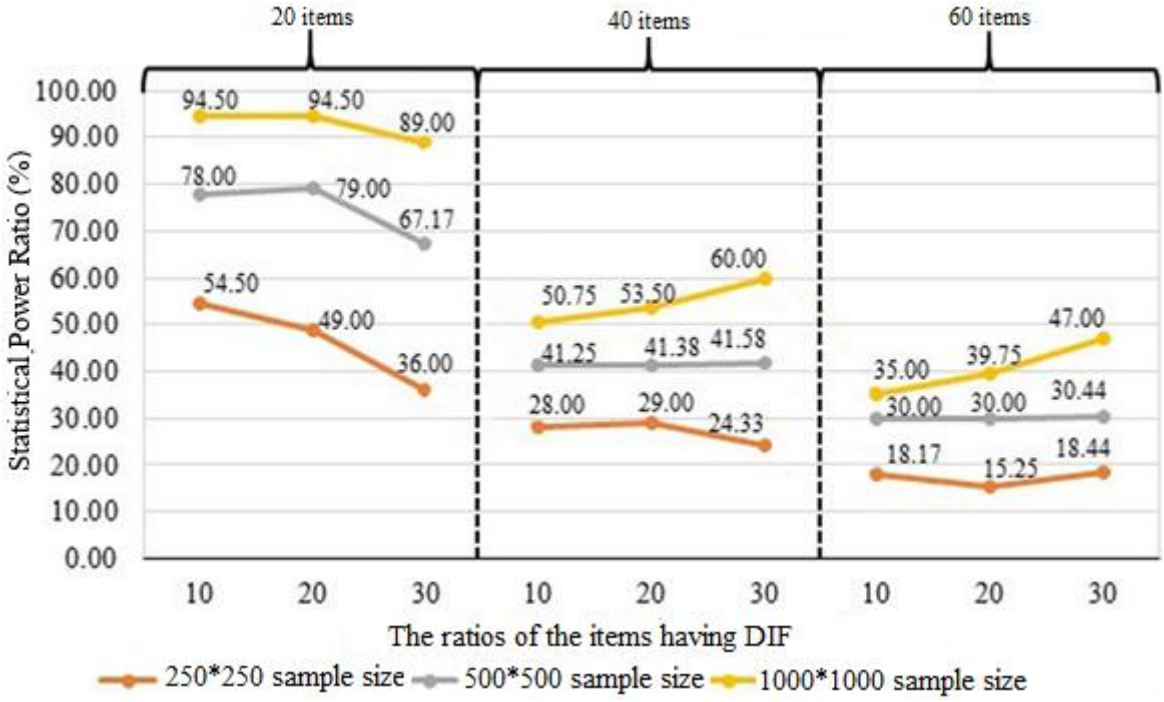
Graph 7. *Statistical power ratios for variable of sample size (CIP).*

Graph 7 shows that when the sample size increases, the statistical power ratios obtained by using CIP increase. The statistical power ratios for the variable number of items are given in Graph 8.



Graph 8. *Statistical power ratios for the variable number of items (CIP).*

When Graph 8 is examined, it is seen that the statistical power ratios obtained by using CIP decreases when the number of items increases. The statistical power ratios are presented in Graph 9 for the variable of the ratios of the items having DIF.



Graph 9. *Statistical power ratios for variable of the ratios of the items having DIF (CIP).*

When Graph 9 is examined, it is understood that the variable of the ratios of the items having DIF does not have a clear effect on the statistical power ratios of CIP. When the statistical power ratios are examined, the decrease in the data sets consisting of 20 items; for the data sets consisting of 40 and 60 items, both increase and decrease cases are seen due to the increase in variable of the ratios of the items having DIF.

Findings Related to Common Effect

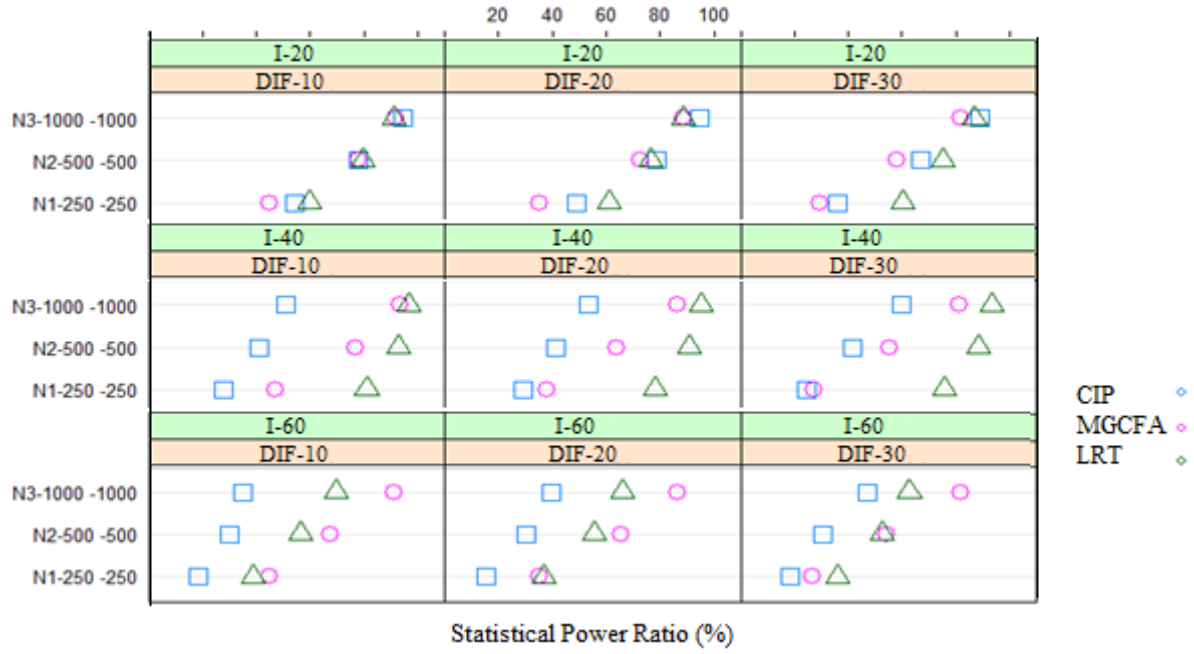
The statistical power ratios of the methods calculated under the manipulated conditions in this study are presented together in Appendix 4. The results in Appendix 4 were reviewed and interpretations were made about conditions in which the statistical power ratios of the methods are high.

When Appendix 4 is examined, it can be seen that LRT gives higher results with the exception of two conditions in which the focus and reference group sample sizes are 250, 60 items –10% the ratios of the items having DIF and the focus and reference group sample sizes are 500. It was identified that the statistical power ratios of the methods differ according to the item number variable in the condition that the sample size condition is 1000/1000. It provides clues about using CIP for data sets consisting of 20-items, LRT for data sets consisting of 40-items, and MGCFA method for data sets consisting of 60-items in the 1000/1000 sample size.

The conditions in which the level of the statistical power ratios of the methods reached the highest level for simulation data sets simulated in the study are arranged as:

- 1000/1000 sample size, consisting of 40 items, %10 the ratios of the items having DIF for MGCFA (%93.50),
- 1000/1000 sample size, consisting of 40 items, %10 the ratios of the items having DIF for LRT (%96.75),
- 1000/1000 sample size, consisting of 20 items, %10 and %20 the ratios of the items having DIF for CIP (%94.50).

Graph 10 represent the common effects of conditions manipulated on the statistical power ratios of the methods.



Graph 10. *Common effects of conditions manipulated on methods*.

When Graph 10 is examined, it is seen that LRT gives higher statistical power ratio than the other two methods for the 16 of the 27 different conditions The MGCFA and the CIP gave higher results in 7 and 4 conditions than the other two methods respectively.

DISCUSSION & CONCLUSION

The findings of the sample size variable obtained from the MGCFA in this study correspond with the findings of Stark et al. (2006), González Roma et al. (2010), Kim and Yoon (2011), Kankaras et al. (2011) and Wells (2013). In this study, like other studies, the increase in sample size was positively reflected in the statistical power ratios of MGCFA. Meade and Lautenschlager (2004) reported that, unlike the findings obtained, the increment of sample size caused a decrease in the statistical power ratios for the MGCFA. It can be argued that this difference arises from the differences between the conditions addressed in the studies. In the study conducted by Meade and Lautenschlager (2004), it is stated that the maximum statistical power ratio for the MGCFA is obtained when sample size is 150, 500 - 1000 for each group is 150. The statistical power ratios for the 20-40 and 60-item data sets are in the range of 29.33 - 92.00; 27.33 - 93.50 and 26.78 - 91.00 respectively. When the other variables are fixed, there are nine different cases for 20, 40, 60 item data sets. The highest statistical power ratios were obtained in six of these nine cases, having 20 items and three of these nine cases, having 40 items. In these findings, in the data sets simulated within the scope of the study, it is revealed that the ideal statistical power ratios were calculated for MGCFA as a result of the analyses, carried out in the 20-item data sets. Besides statistical power of MGCFA decrease belong to the increment of the ratios of the items having DIF. These findings correspond with the study conducted by Kankaras et al. (2011), but not with the Meade and Lautenschlanger (2004). In the study conducted by Kankaras et al. (2011), one and three items in the five-item were modified to affect the equivalence adversely in the simulation data sets. When the number of items having DIF was 1, the statistical power ratio was 56.50%, but when it was 1, it was identified to be 55.90% in the analyses made by using MGCFA. In the study by Meade and Lautenschlager (2004), two or four items from the six items constituting the data sets were simulated to include DIF. It has been reported that, in the analyses performed on the data sets by the MGCFA, the number of items having DIF did not cause a significant change in the statistical power ratios. Since the number of items in the data sets is limited to six in this study, it is possible to say that this difference between this study and Meade and Lautenschlager (2004) arises because of simple structure of the model used in analysis.

In this study, the findings of variable of the sample size for the LRT correspond with the findings of Ankenmann et al. (1999), Meade and Lautenschlager (2004), Stark et al. (2006), Atar and Kamata (2011), Kankaras et al. (2011), Kim and Yoon (2011) and Elosua and Wells (2013). In these studies, values between 100 and 2000 were chosen for the sample size. In all of these studies it has been found that the statistical power ratios of the LRT also change in parallel with the change in sample size, as identified in this study. Another conclusion regarding LRT is related to variable of the number of items. It was identified that the ideal number of items that

can be used for LRT in the simulation data sets simulated in this study. In other words, the statistical power ratios of LRT reached the highest level in data sets consisting of 40 items. The results for the variable of the ratios of the items having DIF differ from the results obtained by Meade and Lautenschlager (2004) while correspond with the results obtained by Kankaras et al. (2011). In this study, it was identified that the increment of the variable of the ratios of the item having DIF resulted in a decrease in the statistical power ratios of LRT. However, Meade and Lautenschlager (2004) reported that this variable did not have a significant effect on the statistical power ratios of the LRT. It can be argued that this difference of the results in the studies originated from the differences in the manipulated conditions and the models used in the analyses.

The statistical power ratios of the CIP reached the highest level when the sample sizes of the reference and focal group were 1000/1000 in all levels of the variable of the number of items and the variable of the ratios of the items having DIF. In addition, the results obtained for this method indicate that when the ratios of the items having DIF is kept constant, the increment of the number of items affects the statistical power ratio negatively. It was found that the highest statistical power ratios were obtained for the 20 item data sets when the variables of the sample size and the ratios of the items having DIF were kept constant.

Recommendations:

In this section, recommendations for the application of the methods, whose statistical power ratios were examined are presented.

- It may be advisable to use the likelihood ratio test for the measurement equivalence analysis in the studies to be performed if the sample size of the comparison groups is between 250 and 500
- When a measurement tool consisting of 40 items with one dimension is used, it may be advisable for researchers to prefer the likelihood ratio test for measurement equivalence analysis.
- When a measurement tool consisting of 60 items under one dimension is used, it may be advisable for researchers to prefer the multi group confirmatory factor analysis for measurement equivalence analysis.
- In cases where the sample sizes of the focus and reference groups are approximately 1000 and the data sets are consisting of 20 items, comparison of the item parameters method can be used to examine measurement equivalence.
- It may be advisable for the researchers to plan each sample size of the focus and reference group to be at least 500 therefore the likelihood ratio test can reach the sufficient level for the statistical power ratio (> 70%) in cases where the data sets are consisting of 20 and 40 items.
- In order that the multi-group confirmatory factor analysis method can reach the statistical power ratios at a sufficient level regardless of the number of items, it can be suggested that the sample size of the comparison group should be approximately 1000.
- It may be advisable for the researchers to plan each sample size of the comparison groups to be at least 1000, therefore the comparison item parameters method can reach sufficient level for the statistical power ratio in cases, where the data sets are consisting of 20.

Statements of Publication Ethics

The research was carried out on simulative data; it does not contain any application made on individuals in any way.

Researchers' Contribution Rate

The article was produced from the first author's doctoral thesis. The study process was carried out by the first author, under the supervision of Prof. Dr. Nizamettin KOÇ.

Conflict of Interest

There is no conflict of interest in the study.

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APPENDIX

Appendix 1. The statistical power ratios of MGCFA

Sample Size		Number of items	Ratios of the items having DIF	Statistical power ratios
Focal	Reference			
250	250	20	10	45.00
500	500	20	10	78.00
1000	1000	20	10	92.00
250	250	20	20	35.00
500	500	20	20	72.50
1000	1000	20	20	88.50
250	250	20	30	29.33
500	500	20	30	58.00
1000	1000	20	30	82.00
250	250	40	10	47.00
500	500	40	10	77.00
1000	1000	40	10	93.50
250	250	40	20	38.00
500	500	40	20	63.75
1000	1000	40	20	86.50
250	250	40	30	27.33
500	500	40	30	55.33
1000	1000	40	30	81.00
250	250	60	10	44.67
500	500	60	10	67.33
1000	1000	60	10	91.00
250	250	60	20	35.17
500	500	60	20	65.67
1000	1000	60	20	86.67
250	250	60	30	26.78
500	500	60	30	54.11
1000	1000	60	30	81.89

Appendix 2. The statistical power ratios of LRT.

Sample size		Number of items	Ratios of the items having DIF	Statistical power ratios
Focal	Reference			
250	250	20	10	59.75
500	500	20	10	79.75
1000	1000	20	10	91.25
250	250	20	20	61.00
500	500	20	20	76.33
1000	1000	20	20	88.83
250	250	20	30	60.33
500	500	20	30	75.25
1000	1000	20	30	87.00
250	250	40	10	81.00
500	500	40	10	93.00
1000	1000	40	10	96.75
250	250	40	20	78.25
500	500	40	20	90.75
1000	1000	40	20	95.15
250	250	40	30	75.50
500	500	40	30	88.25
1000	1000	40	30	93.33
250	250	60	10	39.00
500	500	60	10	56.25
1000	1000	60	10	69.50
250	250	60	20	37.00
500	500	60	20	55.75
1000	1000	60	20	66.25
250	250	60	30	36.25
500	500	60	30	52.50
1000	1000	60	30	62.75

Appendix 3. The statistical power ratios of CIP.

Sample size		Number of items	Ratios of the items having DIF	Statistical power ratios
Focal	Reference			
250	250	20	10	54.50
500	500	20	10	78.00
1000	1000	20	10	94.50
250	250	20	20	49.00
500	500	20	20	79.00
1000	1000	20	20	94.50
250	250	20	30	36.00
500	500	20	30	67.17
1000	1000	20	30	89.00
250	250	40	10	28.00
500	500	40	10	41.25
1000	1000	40	10	50.75
250	250	40	20	29.00
500	500	40	20	41.38
1000	1000	40	20	53.50
250	250	40	30	24.33
500	500	40	30	41.58
1000	1000	40	30	60.00
250	250	60	10	18.17
500	500	60	10	30.00
1000	1000	60	10	35.00
250	250	60	20	15.25
500	500	60	20	30.00
1000	1000	60	20	39.75
250	250	60	30	18.44
500	500	60	30	30.44
1000	1000	60	30	47.00

Appendix 4. Statistical power ratios of the methods for variables of sample size, number of items, and the ratios of the items having DIF

Sample size (F/R)	Number of items	The ratios of the items having DIF	MGCFA	LRT	CIP
250/250	20	10	45.00	59.75	54.50
500/500	20	10	78.00	79.75	78.00
1000/1000	20	10	92.00	91.25	94.50
250/250	20	20	35.00	61.00	49.00
500/500	20	20	72.50	76.33	79.00
1000/1000	20	20	88.50	88.83	94.50
250/250	20	30	29.33	60.33	36.00
500/500	20	30	58.00	75.25	67.17
1000/1000	20	30	82.00	87.00	89.00
250/250	40	10	47.00	81.00	28.00
500/500	40	10	77.00	93.00	41.25
1000/1000	40	10	93.50	96.75	50.75
250/250	40	20	38.00	78.25	29.00
500/500	40	20	63.75	90.75	41.38
1000/1000	40	20	86.50	95.15	53.50
250/250	40	30	27.33	75.50	24.33
500/500	40	30	55.33	88.25	41.58
1000/1000	40	30	81.00	93.33	60.00
250/250	60	10	44.67	39.00	18.17
500/500	60	10	67.33	56.25	30.00
1000/1000	60	10	91.00	69.50	35.00
250/250	60	20	35.17	37.00	15.25
500/500	60	20	65.67	55.75	30.00
1000/1000	60	20	86.67	66.25	39.75
250/250	60	30	26.78	36.25	18.44
500/500	60	30	54.11	52.50	30.44
1000/1000	60	30	81.89	62.75	47.00

BARÜ Bartın University Journal of Faculty of Education BUEFAD

2023, Volume 12, Issue 1, 167-179
dergipark.org.tr/buefad
DOI: 10.14686/buefad.1015451

Factors that Increase and Decrease Teachers' Motivation: The example of Gaza

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Research Article
Received: 27.10.2021
Revised: 20.07.2022
Accepted: 22.07.2022

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ABSTRACT

The goal of this study is to find out the situations that motivate and demotivate teachers in their job. In this study, phenomenology, one of the qualitative research method designs, was used to reveal the factors affecting teachers' motivation. Content analysis, one of the qualitative data analysis techniques, was used to examine the acquired data. The study group consisted of (25) teachers working in primary schools in Gaza Governorate-Occupied Palestine in the academic year 2019-2020. They were selected according to the convenience sampling method. (15) extrinsic motivators, (26) intrinsic motivators, (32) extrinsic demotivators, and (3) intrinsic demotivators emerged from the analysis and interviews. The findings of the study are in line with the attribution theory of motivation, especially the dimension of locus of causality, as teachers' motivators and demotivational factors are classified according to internal and external motivation factors. In addition, some factors can be attributed to the stability dimension, specifically the demotivational factors including the school physical environment, administrative bureaucracy, the routine of governmental organizations, weak incentives, and unstable political conditions. These factors are stable causes that influence teachers' behaviours consistently over time. Internal motivating factors are effective in increasing motivation more than exterior motivating factors; however, the external factors are effective in decreasing the motivation of teachers more than the internal factors.

Keywords: Motivation, teacher, primary school, attribution theory

Öğretmenlerin Motivasyonunu Arttıran ve Azaltan Faktörler: Gazze Örneği

ÖZ

Bu çalışmanın amacı, öğretmenleri mesleklerinde motive eden ve motivasyonlarını azaltan iç ve dış motivasyon etkenlerini ortaya çıkarmaktır. Çalışmada öğretmenlerin mesleki motivasyonlarını etkileyen faktörleri ortaya çıkarmak için nitel araştırma yöntemi, fenomenoloji deseni kullanılmıştır. Elde edilen verilerin çözümlenmesinde nitel veri analiz tekniklerinden içerik analizi kullanılmıştır. Çalışma grubunu 2019-2020 eğitim öğretim yılında Gazze Valiliği-İşgal Altındaki Filistin'deki ilköğretim okullarında görev yapan ve kolay ulaşılabilir durum örneklemesi yöntemiyle seçilen 25 öğretmen oluşturmuştur. Elde edilen verilerin analiz edilmesi sonucu 15 dışsal motive edici etken, 26 içsel motive edici etken, 32 dışsal motivasyonu azaltan etken ve (3) içsel motivasyonu azaltan etken ortaya çıkmıştır. Araştırmanın bulguları, öğretmenlerin motive edici ve motivasyonu azaltan faktörlerin içsel ve dışsal motivasyon faktörlerine göre sınıflandırılması nedeniyle, özellikle nedensellik odağı boyutu olmak üzere, motivasyonun yükleme teorisi ile uyumludur. Buna ek olarak, istikrar boyutuna, özellikle okulun fiziksel ortamı, idari bürokrasi, devlet kurumlarının rutini, zayıf teşvikler ve istikrarsız siyasi koşullar dahil olmak üzere motivasyon bozucu faktörler gibi bazı faktörler atfedilebilir. Bu faktörler, öğretmenlerin davranışlarını zaman içinde tutarlı bir şekilde etkileyen sabit nedenlerdir. Motivasyonu artırmada içsel motive edici faktörler, dışsal motive edici faktörlerden daha fazla etkilidir; ancak dış etkenler öğretmenlerin motivasyonunu azaltmada iç etkenlerden daha fazla etkilidir.

Anahtar kelimeler: Motivasyon, öğretmen, ilkokul, yükleme kuramı

To cite this article in APA Style:
Mdookh, W. & Yıldırım, İ. (2023). Factors that increase and decrease teachers' motivation: The example of Gaza. *Bartın University Journal of Faculty of Education, 12*(1), 167-179. https://doi.org/10.14686/buefad.1015451

INTRODUCTION

There is a growing urgency to adopt Education for Sustainable Development (ESD) in national education systems, given the accelerating global challenges of unsustainability on multiple levels (Singer-Brodowski et al., 2019). Education seems to be in the news almost every day. Governments place a high priority on education. Teachers and schools have had to deal with a slew of new developments in recent years, with many more to come (Dean & Dean, 2002). Schools and teachers are currently dealing with a slew of new allegations (Rauch, 2002).

Schools are non-profit educational institutions dedicated to teaching and learning. The school's ultimate purpose is teaching students; in fact, the school's basic existence is based on this role (Hoy & Miskel, 2012). A classroom can be a learning lab, a social centre, a peer group, a lunch group, and so on. A teacher's immediate priority is to gain and maintain student cooperation in classroom activities (Doyle,1980). Every teacher is in charge of the children's education. In many ways, a teacher has an impact on the students he or she educates. Many students will discover things that will stay with them for the rest of their lives as a result of the teacher's efforts. It entails a significant amount of responsibility (Dean & Dean, 2002).

If the schools' primary function is to focus on attempts to improve quality, the teacher is unquestionably the most essential factor in promoting student learning within the school (Leu,2005). According to the research, there is a substantial correlation between school effectiveness and teacher performance (Özgenel & Mert, 2019). When teachers created a positive and safe relationship with students, their academic achievement increased (Hartzell, 2018).

Administrators face difficulty in developing motivated teachers who are actively involved in teaching and learning, open to new ideas and techniques, and committed to students, as well as teachers who change throughout their careers (Hoy & Miskel, 2012). Teachers' professional attitudes, enthusiasm, and motivation, in combination with their teaching skills, are crucial in ensuring high-quality learning (Leu,2005). Thus, the motivation of teachers plays an important role in the education process. Motivation is the process of mobilizing and maintaining behaviour in a specific direction. Determining a person's purpose is impossible until he behaves or acts (Agarwal, 2005).

In occupied Palestine, studies about motivation are of fundamental importance to researchers and educational leaders. The study of Kalloub (2017) has concluded that the level of enhancing motivation for secondary school teachers in the Ministry of Education in Gaza Governorates was appreciated highly. The study also concluded that there is a statically significant relationship between creative leadership and enhancing motivation. Furthermore, Abu-Shanab (2020) examined the relationship between job security and work motivation for teachers and found that there is a high estimation level of teachers' motivation to work. According to the study, there is a positive correlation of statistical significance between the degree of teachers' sense of job security and motivation to work in governmental schools in the Gaza provinces. In addition, the study of Abu-Samrah and Hamarshah (2014) revealed a high positive correlation of statistically significant between the estimation of leadership practices and achievement motivation. However, the mentioned studies used the quantitative relational approach rather than using the qualitative one. Qualitative research can offer in-depth descriptions and assessments of certain practices, processes, or incidences. Some studies record events, while others help participants get a better knowledge of a technique to enhance it (McMillan & Schumacher, 2010).

Meanwhile, there is no dearth of international studies about motivation. The study of Mashaqbah (2018) showed that to achieve high performance among teachers, educational officials should consider developing rules, and instructions for incentive systems. In addition, the study of Johnson (2000) discovered that (390) of the (747) comments were categorized as motivating elements (52%) and (357) as demotivating factors (48%) by the researchers. Curricular Matters (16%), Classroom Matters (29%), and Administrative Matters (16%) were the three categories that were ranked from lowest to highest in terms of the number of comments (55 %). Exams, textbooks, and curriculum were among the curricular subcategories; teachers and students were among the classroom subcategories; and training, salary, equipment, extra materials, mandated policies, physical space, academic freedom, colleagues, supervisors, and "other" subcategory were among the administrative subcategories. Furthermore, the study of Börü, (2018) aimed at giving an in-depth examination of the internal and external factors that influenced teacher job motivation, while the study of Ada et al. aimed at finding out intrinsic and extrinsic motivators that motivate or demotivate classroom teachers. The results of the current study will open new perceptions to academic researchers about intrinsic and extrinsic factors of teachers' motivation. The researchers

believe that determining the factors that increase and decrease teachers' motivation is a critical topic (Börü, 2018). As a result, this study aims at adding to the literature by incorporating teacher perspectives on motivation.

According to Hoy and Miskel (2012), we all have experienced what it is like to be motivated. What motivates and guides our actions? Some theories claim that motivation is personal and internal and that it is based on needs, interests, curiosity, and pleasure. Other possibilities include incentives, rewards, pressure, punishment, and other external and contextual influences. Various theories exist to explain how needs, beliefs, and objectives motivate people. Concerning the attribution theory, the perceived causes of success and failure have three characteristics in common: locus, stability, and controllability, with intentionality and globality as additional potential causal structures (Weiner, 1985). The needs theory, as summarized by McLeod (2007) proposes that (a) human beings are motivated by a hierarchy of needs, (b) needs are arranged in a hierarchy of prepotency, with more basic needs supplied in some way (rather than all or nothing) before higher needs can be met, (c) the order of needs is not rigid but can change depending on external circumstances or individual differences, (d) most behaviour is multi-motivated, that is, it is driven by multiple basic needs at the same time.

Gawel (1996) and Herzberg (1959) devised a two-dimensional model of the factors that influence people's attitudes toward employment. He argued company policy, supervision, interpersonal relations, working circumstances, and salary are hygiene factors rather than motivators. According to the theory, job dissatisfaction might be caused by a lack of hygienic aspects. The dissatisfiers are related to the circumstances in which the person performs his or her duties. In contrast, he deduced from the data that the motivators were elements that enhanced a person's job; he discovered five factors in particular to be strong predictors of job satisfaction: achievement, recognition, the work itself, responsibility, and advancement. These motivators (satisfiers) were linked to improvements in work performance over time.

The third version of the motivation-hygiene theory Herzberg (1976) emphasizes more on job enrichment applications. It does, however, extend the theory in various ways. One application of the two-factor principle is the creation of worker typologies. The following is a list of the normal types (Herzberg, 2005):

The person who has both hygiene and motivator fulfillment, who is not unhappy (hygiene) and is also very happy (motivation);

1. The person who is on both needs systems but has little fulfillment in the hygiene area even though motivator satisfaction is good. Such a "starving artist" is both unhappy and happy;

2. The person who is also on both need systems but whose satisfactions are reversed-hygiene are good but motivators are poor; such people are not unhappy but neither are they happy;

3. The down and out person who is lacking fulfillment generally and is both unhappy and lacking happiness.

According to research on the Goal-Setting Theory of motivation, the most effective performance appears to come when goals are detailed and challenging when they are utilized to measure performance and relate feedback to results when they inspire commitment and acceptance (Lunenburg, 2011). Other theories include equity theory, expectation theory, and self-efficacy theory.

Poverty, high unemployment rates, and diminishing salaries are hindrances to living standards in the oPt, having detrimental effects on several facets of welfare. Military occupation's political backdrop is revealed to be a significant influence on people's mental health and quality of life. Palestinians have cited a number of factors that significantly impact their personal quality of life, including closures, sieges, checkpoints, roadblocks, the separation wall, instability, and insecurity (Veronese et al., 2018). The emotional wellbeing of students and instructors has been impacted in the Gaza Strip as a result of ongoing violence and the resulting harm and destruction of educational institutions. (OCHA, 2016). In light of these circumstances the researchers felt the importance of conducting this study.

The goal of this study is to reveal the situations that increase and decrease the motivation of teachers in their job. Motivating people is a crucial managerial talent that you will need to be able to master in most work scenarios, whether you are leading a team to reach a corporate goal or motivating coworkers to deliver something that your team requires to meet its objectives (Youell & Youell, 2013). Based on this, this study offers insights for policymakers on how to support teachers' motivation to achieve high-quality learning. In addition, to provide school supervisors and principals with clear keys about the motivational factors behind teachers' behaviour.

METHOD

Research Design

This study employs a qualitative research method to find out the factors that increase and decrease teachers' motivation. Phenomenology is a qualitative research method that tries to turn lived experience into a description of its "essence," allowing them for study and reflection. The researcher uses the normal method to conduct lengthy interviews with the informants to gain a better grasp of their opinions on the phenomenon in their everyday lives (McMillan & Schumacher, 2010). Content analysis, one of the qualitative data analysis techniques, was used to examine the acquired data.

Study Group

The study group consisted of (25) teachers working in primary schools in Gaza Governorate-Occupied Palestine in the academic year 2019-2020. They were selected according to the convenience sampling method, also referred to as accidental sampling or haphazard sampling, which is the process of including whoever happens to be available at the time (Gay et al., 2012) The researcher visited (5) primary schools in the Directorate of Education/west Gaza where the interviews took place. In each school nearly (5) teachers were interviewed. The visited schools were divided into three female primary schools and two male primary schools. Their demographic information was presented in table 1.

Table 1. Demographic Information of the study group and coding

codes	gender	Social status	Age	Working duration	Department	Academic level
T1	female	married	50	23	Math	bachelor
T2	female	married	45	12	Class teacher	Bachelor
T3	female	widow	40	15	Class teacher	Master
T4	female	married	34	12	Science	Bachelor
T5	female	married	29	3	Class teacher	Bachelor
T6	female	married	52	21	Class teacher	Bachelor
T7	female	married	32	10	Math	Bachelor
T8	female	married	50	23	Arabic lang.	Bachelor
T9	female	married	55	10	Class teacher	Bachelor
T10	male	married	35	10	Class teacher	Bachelor
T11	male	married	36	11	Class teacher	Bachelor
T12	male	single	27	5	Arabic	Bachelor
T13	male	single	25	3	English	Bachelor
T14	male	married	29	4	Educational management	Doctorate
T15	male	single	28	4	English	Bachelor
T16	male	married	38	16	Technology	Bachelor
T17	female	married	38	13	Technology	Bachelor
T18	Male	married	38	15	Technology	Bachelor
T19	male	married	38	10	Technology	Bachelor
T20	female	married	33	10	Social science	Bachelor
T21	female	married	40	20	Arabic	Bachelor
T22	Female	married	49	25	Arabic	Bachelor
T23	Female	married	45	20	Math	Bachelor
T24	female	Married	43	15	Arabic	Bachelor
T25	Female	Married	54	30	Arabic	Bachelor

Data Collection

The goal of the study led to the development of a semi-structured interview form that consisted of two questions. Teachers from primary schools were interviewed. According to Maykut and Morehouse (1994)The interview was conducted because it is the most effective way of learning about a phenomenon. The literature on the subject was researched and studies were examined before the interview form was created. Professionals in the fields of educational administration, inspection, planning, and economics, as well as experts in the field of education, have altered the semi-structured interview form. To guarantees the accuracy of the questions, the professionals in the educational management field who altered the semi-structured interview form master both languages Arabic and English. Then, the researcher modified the form following the expert notes. After that, a pilot study with five teachers was done to check that the questions in the form were understandable. According to expert opinions and the pilot research, the interview form was fine-tuned one last time. Two questions on the

interview form were aimed at determining the internal and external factors that increase teachers' motivation, as well as the impediments that decrease their motivation while performing their duties. In the interview form, the teachers were asked two questions.

(1) What are the situations that encourage you in your employment, taking into account all elements both inside and outside the school?

(2) When all elements inside and outside the school are taken into account, what factors demotivate you in your job?

Required permissions were secured for the interviews with the teachers working in primary schools. The interviews were scheduled around the availability of the teachers at the time of the interview. The interviewee teachers were met individually at the school. In addition, the school principals supplied a suitable room in each school where the interviews with the teachers were done. Each interview lasted between six and ten minutes. After obtaining the approval of the participants, ten interview sessions were voice recorded; however, the remaining teachers refused to allow the sessions to be recorded. Meanwhile, the researcher jotted down the conversations on a sheet of paper. The researcher introduced herself and discussed the study's purpose to the teachers throughout the first part of the interview.

Data Analysis

According to the fact that qualitative data analysis is an ongoing process of describing, classifying (categorizing), and connecting data, 'linking data entails recognizing substantive rather than formal links between objects' (Flick, 2014). The transcripts of the conducted interviews were written in Arabic, then translated into English by the researcher. After that, two Arabic-English translators revised the translated transcripts. Each transcript is around (1/4) - (1.25) pages. The main themes were determined based on the questions asked during the interviews. Next, the researcher attempted to classify the data using deep reading, and then the researcher attempted to connect data using codes, as Bogdan and Biklen (2002) stated that coding categories are a way of categorizing descriptive data so that material relevant to a specific topic can be physically segregated from other data. The themes were divided into internal and external motivating and demotivating factors according to the attribution theory of motivation.

Information on the Credibility, Transferability, Reliability, and Confirmability of the Research

After the study was completed to a large extent, the opinions of the participants regarding the findings, comments and results were taken. All participants accepted the findings, comments, and conclusions. The participants' quotes were used to demonstrate the evidence for each theme that arose from the data analysis. The raw data were retained so that they may be used for further studies by other researchers. This contributed to the credibility of the study. For the transferability of the study, detailed information about the research sample was given, and all stages of the study were tried to be expressed clearly and thoroughly. Before the interviews, each participant was chatted to meet and build trust. (Lincoln & Guba, 1986).

Consistency, among coders of datasets, is an indicator of reliability in such studies (Creswell, 2016). The reliability of the study was determined by using Miles and Huberman's (1994) Reliability Formula = Consensus / Consensus + Disagreement. Another expert from the field of educational sciences reclassified the data set under the determined themes. A 72% similarity was found between the classification made by the educational sciences specialist and the researchers. When this rate is over 70%, it can be considered as evidence for the reliability of the research (Miles & Huberman, 1994). The codes that were not agreed upon were placed in the themes by consensus as a result of the evaluation of the experts and researchers. Before the interviews, the consent of the participants was obtained and the interviews were conducted voluntarily. Participants were informed about the use of the data for scientific purposes and the confidentiality of their personal information.

Research Ethics

During the study, ethical considerations were taken into account, and no intervention that could be harmful to participants was used. This study simply required primary school teachers' perspectives on motivation and demotivation factors by keeping in line with its goal. As a result, all participants signed a consent form before giving their opinion on the research issue, indicating that they agreed to engage in the study voluntarily.

FINDINGS

The research's findings are divided into four sections, according to the themes and subthemes. They were created based on the opinions of the primary teachers and based on theoretical perspectives. The external motivation factors of teachers are examined in the first section. The internal motivation factors of teachers are examined in the second section. The external factors that decrease teachers' motivation are examined in the third section, and the internal factors that decrease teachers' motivation are examined in the fourth section.

Extrinsic Motivation Factors of Teachers

Table 2. shows that the teachers who were interviewed have (15) classified external motivation sources. The following are examples of extrinsic motivation sources in terms of frequency of expression: “Salary (3), Management’s appreciation (3), Concerned parents (2), Teaching team and effective management (3), Students’ interest (2), Encouragement of parents (1), Communication with the Directorate and the Ministry(1), Economic stability(1), collaboration (1), Provision of needed tools (1), School environment: the psychosocial atmosphere at school (1), Job security(1), The rapid development of technology (1), Students’ academic high level (1)”.

The following are some of the statements made by the teachers who were interviewed about external motivation sources.

Table 2. Extrinsic Motivation Factors of Teachers

#	Codes	Participants
1	Salary, make a profit	T5, T10, T13, T25
2	Management’s appreciation	T10, T11, T14
3	Concerned parents	T10, T14
4	The teaching team and effective management (Administration and teaching staff)	T11, T13, T4
5	Students’ interest	T13, T14
6	Encouragement of parents	T6
7	Communication with the Directorate and the Ministry	T6
8	Economic stability	T9
9	Collaboration	T10
10	Provision of needed tools	T13
11	School environment: the psychosocial atmosphere at school	T4
12	Job security	T14
13	The rapid development of technology.	T17
14	Students’ academic high level	T13, T25
15	Students’ motivation	T20

“Students’ interest and the follow up of the parents motivate me.” (T13), “besides make a profit is good because I feel motivated when I make a living from teaching.” (T5), “the principal appreciation, when he appreciates my effort, I feel motivated.” (T14), “what motivates me is that the principal is a director and a human, ultimate responsibility, however, lies further up the chain of command.” (T11). “The encouragement of parents affects the motivation positively, as well as the Directorate and the Ministry encourage and reinforce us.” (T6). “Concerning the factors that encourage me are documenting what I achieve from teaching and reaping the benefits of my teaching, and improve the materialistic situation. In addition to the good treatment of the leader who is responsible in the school, the good relation in the school, passion for career and academic honesty are reasons for encouragement”. (T25) “The motivation factors for me are the teaching profession and the religious morals, as the human who offers benevolence, got rewarded on it, it’s our prophets’ profession. In addition, the distinguished teamwork and good effective management, principals and supervisor appraisal” (T11) “Regarding the factors that increase my motivation is that teaching is a cause for living, I mean the material side, …. What demotivates me is the incomplete salary as I just receive 40% of the salary” (T10)

Intrinsic Motivation Factors of Teachers

Table 3. demonstrates that the interviewed teachers have (26) different types of internal motivation sources. In terms of frequency of expression, the following are examples of internal incentive sources: “Passion of career (10), Academic honesty (7), Psychological comfort in the school (6), Students’ love (5), Religious morals (5), Allah’s sake (4), Serve the community (4), Self- fulfillment (4), Satisfaction (3), Professional belongingness (2), Love to

give (2), Love of Teaching material (2), Devotion (2), Achieving social status (1)". The following are some of the teachers' statements about intrinsic motivation sources.

"Passion for career, love to teach first-grade students, love to work, devotion, as I have also been afforded many opportunities, but I refused." (T6), "what motivates me is the passion for career, academic honesty, the specific nature of the profession, thoroughness, students love and religious morals." (T8), "I feel motivated by promoting the society and bringing up a conscious and educated generation, stimulating students' motivation to research and learn, and desire to see the positive change I am making in changing students' behaviour." (T18). "I feel encouraged because I work to achieve self-fulfillment, achieve social status, achieve the status of women in society, we have a footprint in society to make". (T1) "Passion for career and specialization motivated me to work and that it is a task, I want to convey to the students". (T19). "The things that encourage me in my employment are commitment and passion for my career, and self-affirmation besides achieving the goals that I planned for". (T17) "In my opinion, the conscience, the religious moral, the societal moral as providing something to the people of my country, honesty, the principal appreciation, when he appreciates my effort, I feel motivated, job security, love and familiarity in the school family, desire to give and love to school, the concerns of parents and following up the homework, … all of these motivates me" (T14)

Table 3. Intrinsic Motivation Factors of Teachers

#	Codes	Participants
1	Passion for career	T3, T6, T7, T8, T9, T15, T17, T19, T24, T25, T10
2	Academic honesty	T8, T12, T14, T15, T16, T19, T25
3	Psychological comfort in the school	T4, T13, T14, T22, T24. T25
4	Students love	T2, T3, T7, T8, T15
5	Religious morals	T7, T8, T10, T11, T14
6	Allah's sake	T2, T6, T11, T12
7	Serve the community	T10, T14, T17, T18
8	Self-fulfillment	T1, T2, T10
9	Satisfaction	T11, T12, T16
10	Professional belongingness	T2, T17
11	Love to give	T3, T14
12	Love of teaching material	T3, T19
13	Devotion	T4, T6
14	Achieving social status	T1
15	Achieving the status of women in society	T1
16	Intention	T4
17	Self-development	T5
18	Self-affirmation	T5, T17
19	The specific nature of the profession	T8
20	Respect Learning and teaching	T7
21	Mastery	T8
22	Conscience	T16
23	Instilling the importance of education before teaching in the minds of young people	T18
24	Stimulating students' motivation to research and learn	T18
25	Desire to see the positive change I am making in changing students' behaviour	T18
26	Carry out official duties	T12

Extrinsic Factors Disrupting the Motivation of Teachers

When looking at Table 4., it can be seen that the interviewed teachers have classified extrinsic motivation factors that decrease motivation into (32) codes. The following are extrinsic demotivation factors in terms of frequency of expression:" Incomplete salary (14), Lack of educational tools (6), Information overload in curricula (6), Parents' lack of attention to students (5), Competitiveness among teachers (5), Many school activities and competitions (5), The poor economic situation of the students' families (3), Electricity blackout (3), Society's view

of the Teaching Profession (2), Jealousy of colleagues (2), Formalism (2), Lack of compatibility of qualification with the field of work (2)". Below are a few of the teachers' statements regarding the extrinsic motivation sources that detract motivation.

Table 4. Extrinsic Factors Disrupting the Motivation of Teachers

#	Codes	Participants
1	Incomplete salary	T1, T2, T7, T8, T9, T10, T12, T14, T15, T19, T20, T22, T23, T25
2	Lack of educational tools	T5, T6, T10, T12, T14, T24, T18
3	Information overload in curricula	T6, T9, T10, T18, T22, T23
4	Parents' lack of attention to students	T1, T5, T9, T10, T14, T19
5	Competitiveness among teachers	T2, T14, T20, T22, T23
6	Many school activities and competitions	T4, T8, T21, T22, T23
7	The poor economic situation of the students' families	T6, T7, T8
8	Electricity blackout	T17, T18, T19
9	Society's View of the Teaching Profession	T1, T15
10	Jealousy of colleagues	T2, T20
11	Formalism	T2, T8
12	Lack of compatibility of qualification with the field of work	T3, T14
13	Pressure to complete the program content in a limited time	T4, T10
14	The difference between teacher's social class and that of the student	T5, T6
15	Negligent management approach	T14, T20
16	Students' lack of attention	T15, T23
17	The director distinguishing among teachers	T21, T22
18	Students' low academic level	T24
19	School management violence	T25
20	Many problems in the school	T25
21	School physical environment	T25
22	The unfairness of school administration in performance appraisal	T20
23	Administrative bureaucracy	T16
24	Reluctance to accept active learning methods	T16
25	The routine of governmental organizations.	T17
26	Nepotism "Cronyism "and favoritism	T17
27	An excess number of students in the class	T6
28	Weak incentives	T9
29	excessive workload	T9
30	Unstable political conditions	T9
31	Lack of teacher encouragement by the Directorate of Education	T3
32	Teacher's lack of appreciation after years of long service	T1, T2, T21, T24

"Incomplete salary, competitiveness among teachers, jealousy of colleagues, and focusing more on formalism as teaching becomes as a form of documentation through recording videos" (T2), "Incomplete salary, competitiveness among teachers based on jealousy of teachers, Negligent management approach, and the unfairness of school administration in performance appraisal are the demotivation factors for me." (T20), "the obstacles that hinder my motivation are the incomplete salary and weak incentives, excessive workload, parents' lack of attention to their students, the unstable political conditions, and the overload curricula." (T9), "what hinders my motivation is the routine of governmental organizations, nepotism, and favouritism, and electricity blackout" "I feel demotivated when I recognize that parents are not concerned with their children. Teaching is the most difficult job among all other jobs, teaching is the job that produces all other jobs. However, its evaluation in society does not give it what it deserves, I feel frustrated because after all, I have done, I just receive 35% of my salary. That is, there is no appreciation after too long years of work". (T1) "The absence of electricity, the materialistic sides affect me as a teacher negatively, the great number of unconcerned parents with their students, just a few numbers of them who cared". (T19) "I face the following demotivators, there are not sufficient educational tools because of the economic situation. Previously I provided all the needed educational tools such as printing

worksheets, which we used to organize trips. Now, we ask the students to print the paper form, but they cannot afford it, and parents can't take all that burden. Besides, there's a lot of information in new curricula. But frankly, nothing can hinder the motivation such as the excess number of students in the class. Not every student can get involved in the activity, as we have around (45) students in the class" (T6) "Incomplete salary, competitiveness among teachers based on jealousy of teachers, negligent management approach, and the unfairness of school administration in performance appraisal are the demotivation factors for me." (T20)

Internal Factors Disrupting Teachers' Motivation

Table 5. shows that three categorized internal motivation factors lower the motivation of the interviewed teachers in the classroom. In terms of frequency of expression, extrinsic motivational factors are Tiredness (1), Psychological status (2), Frustration (1)". The primary teachers' statements about the sources of intrinsic motivation that hinder motivation are included below.

Table 5. Internal Factors Decreasing the Motivation of Classroom Teachers

#	Codes	Participants
1	Tiredness	T4
2	Psychological status	T15, T23
3	Frustration	T1

"Psychological status is affected by the incomplete salary" (T23).

DISCUSSION & CONCLUSION

There were (15) exterior motivating factors, (26) internal motivating factors, (32) demotivating external factors, and (3) demotivating internal factors identified in this study, which were undertaken to discover the motivational components of teachers. Extrinsic motivation is produced by rewards or punishments based on task performance or failure. Intrinsic motivation occurs when the task is enjoyable or rewarding in and of itself (Lin et al., 2003). It has been observed that teachers are more influenced by intrinsic motivation than extrinsic motivation in fulfilling their duties. This can be interpreted as an indication that teachers do their jobs willingly and lovingly. On the other hand, it has been understood that the internal factors that reduce the motivation of the teachers are quite a few while that the external factors that reduce the motivation are more and more diverse. This finding suggests that teachers are deprived of an environment that supports their intrinsic motivation resources.

Regarding the attribution theory, the dimension of locus of causality, which describes the internality or externality of an attribution, can be used to classify it (Harvey & Martinko, 2009; Gundlach et al., 2002; Weiner, 1985). The stability dimension can also be used to categorize causal attribution. Stable causes are those that have a constant impact on outcomes and behaviours over time and in different settings (Harvey & Martinko, 2009).

The findings of the study are in line with the attribution theory of motivation, especially the dimension of locus of causality, as teachers' motivators and demotivational factors are classified according to internal and external motivation factors. In addition, some factors can be attributed to the stability dimension, specifically the demotivational factors including the school physical environment, administrative bureaucracy, the routine of governmental organizations, weak incentives, and unstable political conditions. These factors are stable causes that influence teachers' behaviours consistently over time.

According to the results of the research, internal motivating factors are effective in increasing motivation more than exterior motivating factors; however, the external factors are effective in decreasing the motivation of teachers more than the internal factors. The internal motivating factors include a passion for career, academic honesty, psychological comfort in the school, love for children, and students, religious morals, Allah's sake, serve the community, etc… that assert the findings of (Hussein, 2016), which targeted Arab teachers from (9) Arab countries including Occupied Palestine. The internal motivating factors included the belief in the message delivered by teachers and its main reward by God, a passion for a career, and the feeling of teachers' role in society. On the other hand, the external demotivating factors included the incomplete salary, lack of educational tools, competitiveness among teachers, many school activities and competitions, etc…emphasize the findings of (Altahayneh & Hatamleh, 2011). Concerning the findings of their study, the biggest job source of stress that affects physical education teachers are the salary, dealing with students, dealing with the management, relations with colleagues, physical environment, and educational supervision.

People are motivated to meet particular needs, and some needs take precedence over others. Physiological needs, safety needs, love and belongingness requirements, esteem needs, and self-actualization needs are the five stages of the original hierarchy of needs paradigm (McLeod, 2007; Maslow, 1943, 1954). McLeod (2007) and Maslow (1987) also mentioned that most behaviour is multi-motivated, stating that "any activity tends to be determined by several or all of the basic needs at the same time rather than by just one of them."

Concerning the findings of the study, some of the teacher's motivation factors are related to the needs of the five-stage model. Regarding the physiological needs, three teachers have mentioned the salary as a motivating reason that offers them food, drink, and shelter. Regarding safety needs, one teacher referred to economic stability, and the other mentioned job security. About the love and belongingness, two teachers pointed out the concerned parents, teaching team, and effective management. One teacher referred to the encouragement of parents, and the other stated the communication with the Directorate and the Ministry. Also, six teachers referred to students' love. In terms of esteem needs, ten teachers said passion for career, while three teachers asserted on management's appreciation, and one emphasized on students' academic high level, another one referred to achieving social status and the other to mastery. With self-actualization needs, three teachers stressed self-fulfillment, while two teachers noted self-affirmation, and one said self-development. It should not be forgotten that lower-level needs must be met for teachers to feel the higher levels of Maslow's hierarchy of needs, such as respect, success, and recognition, as well as setting compelling goals such as self-actualization in their work.

In the current study, the internal motivating factors that involved passion for career, academic honesty, psychological comfort in the school, love for students, etc… are in line with the findings of (Börü, 2018). In the study, the researcher stated that the codes, which are related to success, immaterial aims, and personal characteristics, stand out as internal factors affecting teacher motivation. Immaterial aims include 'conscience', 'professional love', 'country love', 'teaching love', 'human love', 'self-sacrifice' and 'idealism'. While 'wanting to succeed', 'do not like monotonous', 'having goals', 'national and international awards' and 'the desire to become a popular teacher' determine the "success" are the sub-themes of the study. In this study, the success sub-themes are in parallel with self-development, self-affirmation, and self-fulfillment. The study of Ada et al. also asserts these findings as they stated that factors arising from one's thoughts, such as the desire not to feel conscientious discomfort, enjoying the teaching profession, love of students, are seen as internal motivating factors. Though, they concluded that the motivators and demotivators were mostly concerned with human relations and traits. Teachers in classrooms in areas with low socioeconomic indicators were shown to require the assistance of a strong and confidence-inspiring supervisor to be motivated. They also needed social experiences like fulfilling human relationships and a sense of accomplishment.

According to the findings of the study, "incomplete salary, lack of educational tools, information overload in curricula, parents' lack of attention to students, competitiveness among teachers, many school activities and competitions, the poor economic situation of the students' families, electricity blackout, society's view of the teaching profession, jealousy of colleagues, formalism, lack of compatibility of qualification with the field of work" are extrinsic motivation factors. They stand out as external factors that demotivate teachers. Thus, these factors are considered hygiene factors. Furthermore, formalism and lack of compatibility of qualification with the field of work are related to company policy. Negligent management approach, the director distinguishing among teachers, and the unfairness of school administration in performance appraisal are linked to supervision. Lack of educational tools, information overload in curricula, many school activities, and electricity blackouts are related to working conditions. Parents' lack of attention and competitiveness among teachers are interpersonal relations, while incomplete salary is related to the salary.

The study found that "passion of career, academic honesty, religious morals, Allah's sake, serve the community, self-realization, satisfaction, professional belongingness, love to give, love of teaching material, devotion, achieving social status, achieving the status of women in society, intention, self-development, and self-affirmation, etc…" are intrinsic motivating factors. They stand out as internal motivators for teachers. Extrinsic motivating factors include "salary, management's appreciation, concerned parents, students' interest, encouragement of parents, communication with the Directorate and the Ministry, economic stability, job security, and students' academic high level". They stand out as external motivators for teachers.

As a result, these factors are regarded as motivators (satisfiers), for example, love to give, stimulating students' motivation to research and learn, desire to see the positive change I am making in changing students' behaviour, and students' academic high level are associated to achievement. Management's appreciation, encouragement of parents, and communication with the Directorate and the Ministry are related to recognition. Also, the passion for

a career, professional belongingness, love of teaching material, the specific nature of the profession, respect for learning and teaching, mastery, and carry out official duties are related to the work itself. While academic honesty, religious morals, Allah's sake, serve the community, conscience, and instilling the importance of education before teaching in the minds of young people are linked to responsibility. Self-realization, achieving social status, achieving the status of women in society, self-development, self-affirmation, salary, economic stability, and job security are linked to advancement.

These findings suggest that the motivators (satisfiers) are nearly expressed in an equal manner to the hygiene factors in terms of frequency of expression and the number of codes related to hygiene or satisfier factors. This means that teachers had motivators that enhanced their jobs and were associated with long-term improvements in job performance, whereas hygiene factors consistently caused only short-term changes in job attitudes and performance, which quickly returned to their former levels.

These findings are in parallel with the first worker typology proposed by Herzberg in the third presentation of the motivation-hygiene theory, in which the person has both hygiene and motivator fulfillment.

Research findings are in contrast with the findings of Büyükses's (2010) that the teachers think that the status of their profession in the society is not in the place it deserves and that the administrators' lack of appreciation for the work done by the teachers does not negatively affect the motivation of the teachers. As "Teacher's lack of appreciation after years of long service" has been reported by four teachers as they agree that lack of appreciation decreases their motivation.

Negligent management approach, the director distinguishing among teachers, school management violence, the unfairness of school administration in performance appraisal, nepotism " cronyism" and favouritism, weak incentives, and lack of encouragement of the teacher by the Directorate of Education are found among the teachers' demotivational factors that are in line with the equity theory in which motivation is affected by the individual perception of being treated fairly in comparison to others (Al-Zawahreh & Al-Madi, 2012; Miner, 1980).

These results show the impact of the economic blockade on the motivation of teachers. It is seen that the factors expressed are mostly related to the Palestinian situation more specifically the situation of Gazans. They continue to enjoy their job, despite the unstable political and economic situation. They still feel the passion for their career, love to give, belongingness to their profession, and have academic honesty, which is considered as satisfiers according to Herzberg. They are also considered internal factors of teachers' motivation in the attribution theory. Meanwhile, they suffer from the unstable economic situation caused the hygiene-related factors such as incomplete salary, lack of educational tools, electricity blackout, and weak incentives. These factors are considered as hygiene factors that caused a temporary change in teachers' performance, also considered as external factors of teachers' demotivation according to attribution theory.

This teacher is an example of the situation in Gaza, where most of the teachers have the internal strong motivation that makes them satisfied, meanwhile, they suffer from the external environment that did not support this strong internal motivation.

Affouneh (2014) stated that the decline in teachers' salaries resulting from the decline in the Palestinian economic situation in general, and the decline in the social status of the teaching profession as a whole reduce the teacher's motivation and the demand for talents in this profession. As for the other factors that put pressure on the teachers and affect their performance, the most important of which are overcrowded classes, poor students' interest in studying, and the lack of devices and means for the teacher such as computers, books, and teaching aids.

In conclusion, the findings of the study can be credited to various motivation theories, most importantly the Attribution Theory, especially the dimension of locus of causality in which the teachers' motivation and demotivation factors are classified to internal and external factors. Meanwhile, the findings of the study ascribed to the Needs Theory where the codes related to the original hierarchy of needs paradigm. Equity theory also explains the teachers' external demotivating factors. Nevertheless, the Motivation-Hygiene Theory likewise clarifies both the teachers' demotivating factors which are considered as hygiene factors. As well, the teachers' motivators factors are considered as satisfiers.

Based on these results:

The educational system's leaders must consider the material, moral, and professional needs of teachers by incorporating them in choices on teaching growth, as well as revising educational policies that the teachers believe

are unfair. They also should prepare social media awareness initiatives on the teaching profession and the role of the teacher in society development.

Statements of Publication Ethics

Ethical permission of the research was approved by Ataturk University Social and Human Sciences Ethics Committee. Ethics committee (date 23.09.2021, meeting number 10, decision number 06).

Researchers' Contribution Rate

All authors contributed equally rate to the research.

Conflict of Interest

We confirm that there are no conflicts of interest associated with this study.

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Bartın University Journal of Faculty of Education BUEFAD

2023, Volume 12, Issue 1, 180-189
dergipark.org.tr/buefad
DOI: 10.14686/buefad.1027353

Investigating the Role of Modeling Practices on Mathematical Literacy

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Research Article
Received: 23.11.2021
Revised: 30.03.2022
Accepted: 01.08.2022

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ABSTRACT

The mathematical literacy or competence notion in PISA deals with the capacity of students to analyze, reason and communicate efficiently as they pose, formulate, solve and interpret mathematical problems in a variety of situations. The best way to improve mathematics literacy is that students have the necessary mathematical knowledge and different problem solving strategies, know when and how to use these strategies, and work with activities that involve different contexts of interest. When considered in this respect, teachers have an important role in the development of students' mathematical literacy. The aim of this study was to investigate the mathematics literacy status of pre-service mathematics teachers through PISA questions. The mathematical literacy status of pre-service teachers was examined within the scope of conceptual, operational and contextual questions and in terms of gender, academic grade point average and mathematical modeling. At the same time, semi-structured interviews have examined the difficulties that pre-service teachers experienced. Fully mixed concurrent equal status design was used. The participants were 113 pre-service mathematics teachers. Independent samples t-test and covariance analysis was used for the comparisons. Qualitative data analysis was conducted with content analysis. The research results, together with the suggestions, reveal important points for future studies.

Keywords: Mathematical literacy, knowledge types, pre-service education, PISA

Modelleme Uygulamalarının Matematik Okuryazarlığı Üzerindeki Rolünün İncelenmesi

ÖZ

Uluslararası Öğrenci Değerlendirme Programı'nı (PISA) yürüten Ekonomik İşbirliği ve Kalkınma Teşkilatı (OECD) tarafından yapılan matematik okuryazarlığının tanımı; matematiğin dünyada oynadığı rolü anlama, sağlam temellere dayanan matematiksel hükümler verme, yapıcı-ilgili düşünce üreten kişiler olarak bireysel yaşamların gereksinimlerini karşılarken matematiği kullanma ve matematikle meşgul olma kapasitesi şeklindedir. Matematik okuryazarlığını geliştirmenin en iyi yolu öğrencilerin gerekli matematiksel bilgiye ve farklı problem çözme stratejilerine sahip olmaları, bu stratejileri ne zaman ve nasıl kullanacaklarını bilmeleri ve ilgilerini çeken farklı bağlamları barındıran etkinliklerle çalışmaları olarak ifade edilmektedir. Bu anlamda öğretmenler, öğrencilerin matematiksel okuryazarlığının gelişmesinde önemli bir role sahiptirler. Bu tespitten yola çıkılarak çalışmada Ortaokul Matematik Öğretmeni Adaylarının matematik okuryazarlık durumlarının PISA soruları üzerinden incelenmesi amaçlanmıştır. Öğretmen adaylarının matematiksel okuryazarlık durumları kavramsal, işlemsel ve bağlamsal sorular kapsamında cinsiyet, akademik not ortalaması ve matematiksel modelleme değişkenleri ile incelenmiştir. Aynı zamanda yarı yapılandırılmış görüşmelerde öğretmen adaylarının yaşadıkları zorluklar ele alınmıştır. Çalışmada tamamen karma eşzamanlı eşit statülü tasarım kullanılmıştır. Katılımcılar 113 matematik öğretmeni adayıdır. Karşılaştırmalar, bağımsız örneklem t testi ve kovaryans analizi ile gerçekleştirilmiştir. Nitel veriler ise içerik analizine tabi tutulmuştur. Araştırma sonuçları, önerilerle birlikte ileriki çalışmalar için önemli noktaları ortaya koymaktadır.

Anahtar kelimeler: Matematiksel okuryazarlık, bilgi türleri, hizmet öncesi eğitim, PISA

To cite this article in APA Style:
Yenmez, A. A., & Gökçe, S. (2023). Investigating the role of modeling practices on mathematical literacy. *Bartın University Journal of Faculty of Education, 12*(1), 180-189. https://doi.org/10.14686/buefad.1027353

INTRODUCTION

Many teachers in mathematics classrooms are likely to be asked, "Why are we learning maths?" When students were unable to recognize the repercussions of the subject matter and its relationship to the real world, they asked, "What will maths accomplish for us in everyday life?" In truth, the answer lies in mathematical literacy, which is defined as the ability to employ mathematical knowledge to the greatest extent feasible when confronted with problems in daily life and in generating solutions to problems (Niss & Jablonka, 2020; Steen, Turner & Burkhardt, 2007). The Organization for Economic Cooperation and Development (OECD) which has been administering the Programme for International Student Assessment (PISA) defined mathematical literacy as understanding the role of mathematics in the world, making mathematical judgments based on solid foundations, the capacity to use mathematics and engage in mathematics while meeting the needs of individual lives. As a result of PISA, mathematical literacy has become the primary concern of educational reforms in many countries. In PISA 2012, the framework for evaluating mathematical literacy was addressed from three perspectives. These are mathematical content, mathematical processes, and mathematical contexts (OECD, 2014). PISA studies enable the education systems of the participating countries to be described, followed, and compared. Considering these results, the need to increase students' mathematical literacy levels constitutes the focus of reform movements in education systems.

According to Bransford, Brown, and Cocking (2001), learners with organized knowledge can solve new issues and remember more relevant information than those who have merely memorized individual mathematical facts or methods. According to Rittle- Johnson and Koedinger (2005), appropriately structured knowledge necessitates people's contextual, conceptual, and procedural knowledge to be integrated within a domain. Contextual knowledge is linked to real-world problems and is introduced into the classroom through the presentation of the problem in a context with its own story. When the problems are described using solely mathematical symbols with numbers, operators, and variables, that they do not evoke any images (Rittle- Johnson & Koedinger, 2005). Conceptual knowledge was defined as a connected web of knowledge, a cognitive network in which node-to-node relationships are as significant as the discrete pieces of information that make up these nodes (Groth & Bergner, 2006; Lenz et al.,2020). According to Hiebert and Lefevre (1986), conceptual knowledge is required to comprehend challenges and to develop new strategies or adapt existing techniques to handle new problems. Procedures are included in procedural knowledge, which entails step-by-step actions and concurrent learning of all components. Knowledge of the formal language or system of symbolic representation of mathematical ideas, as well as knowledge of the rules or algorithms used to perform mathematical tasks, were identified as two categories of procedural knowledge (Hiebert & Lefevre, 1986).

Teacher quality is one of the most critical variables in student performance in international tests, according to studies (An, Kulm & Wu, 2004; Fauth, 2019). The best way to improve mathematics literacy is providing the students with the necessary mathematical knowledge and different problem-solving strategies, ensuring they know when and how to use these strategies, and facilitating activities that involve different contexts of interest. When considered in this respect, teachers have an important role in the development of students' mathematical literacy. Teachers can assist students in developing different mathematical knowledge and skills regarding mathematical literacy by using different teaching methods and techniques that guide students to understand and reason mathematically. In addition to exposing the teacher factor to succeed in international comparative exams, the importance of mathematics teachers' ability to support students' mathematical literacy skills in the field of mathematics education is also very important (Kilpatrick, 2001). For this reason, it is extremely important to determine the mathematics literacy status of pre-service teachers. Researchers have shown that mathematical performance varies across cultures (Chiu & Xihua, 2008; Kriegbaum, Jansen, & Spinath, 2015), but few studies have compared pre-service teacher performance in the specific released items in their analyses or explored categorizations of these items regarding the type of knowledge they require (e.g., Olande, 2014; Sáenz, 2009), that is, school mathematical knowledge (contextual, conceptual, and procedural). Indeed, little is known about the challenges that aspiring teachers face when completing PISA problems (e.g., Sáenz, 2009). There are also a few international studies where pre-service teachers' difficulties regarding PISA questions are investigated. In a study evaluating the mathematics skills of pre-service teachers while solving PISA questions, Sáenz (2009) states the requirement of assessments which employ school mathematics in contextual, conceptual and operational manners. The study showed that contextual knowledge about the real world is important in terms of establishing a relationship between the use of skills needed to solve PISA questions and traditional school mathematics expressed by concepts and processes.

Working with activities that involve many contexts that appeal to students' interests is the greatest strategy to enhance mathematics literacy. Students form permanent associations with mathematics and the world in which they live because modeling problems provide examples with a wide range of linkages (Swan, Turner, Yoon, 2006). Adaptation of modeling activities to school lessons paves the way for students to become social citizens and develop high-level mental skills that are critical in the community. Activities for daily life problems which seek solutions in the learning-teaching process (that progresses with the modeling method) allow many students to develop practice-based beliefs (Maab, 2005). Mathematical modeling makes the world out of mathematics and mathematics bilaterally efficient (Bonotto, 2007; Pollak, 1979). In other words, it is possible to utilize modeling activities to improve mathematics literacy, which means the capacity to transfer mathematics to daily life. Based on these findings, the aim of this study was to investigate the mathematics literacy status of Elementary School Pre-Service Mathematics Teachers through PISA questions. The mathematical literacy status of pre-service teachers was examined within the scope of conceptual, operational, and contextual questions and in terms of gender, academic grade point average, and mathematical modeling. At the same time, semi-structured interviews have examined the difficulties that pre-service teachers experienced with PISA questions.

METHOD

In this study, a fully mixed concurrent equal status design was used (Johson & Onwuegbuzie, 2004). It is a design in which the qualitative and quantitative stages are of equal weight and they are mixed in one or more components of the research at the same time. When quantitative results cannot adequately explain outcomes and qualitative data can help overcome the difficulty by strengthening and explaining the quantitative results, mixed methods research is strongly suggested (Teddlie & Tashakkori, 2003).

Sample

The participants were 113 pre-service mathematics teachers from a state university in the central part of Turkey. They were 57 juniors and 56 seniors studying elementary mathematics education and had no prior experience with PISA items. The third and fourth-grade students were selected as the sample because the current research focused on the role of modeling in mathematical literacy and the mathematical modeling course was given as an elective in the fall semester of the third year. Among the participants, 45 students took mathematical modeling courses whereas the remaining 68 students did not. The study also investigated the gender differences in mathematical literacy so the comparisons were conducted based on the data of 82 females and 31 males.

Instruments

The participants took a computer-based test containing 21 released items of the PISA 2012 mathematical literacy test. Information regarding the tasks of assessment items, type of knowledge, and maximum scores was given in Table 1.

Table 1. Mathematical Literacy Item Descriptions

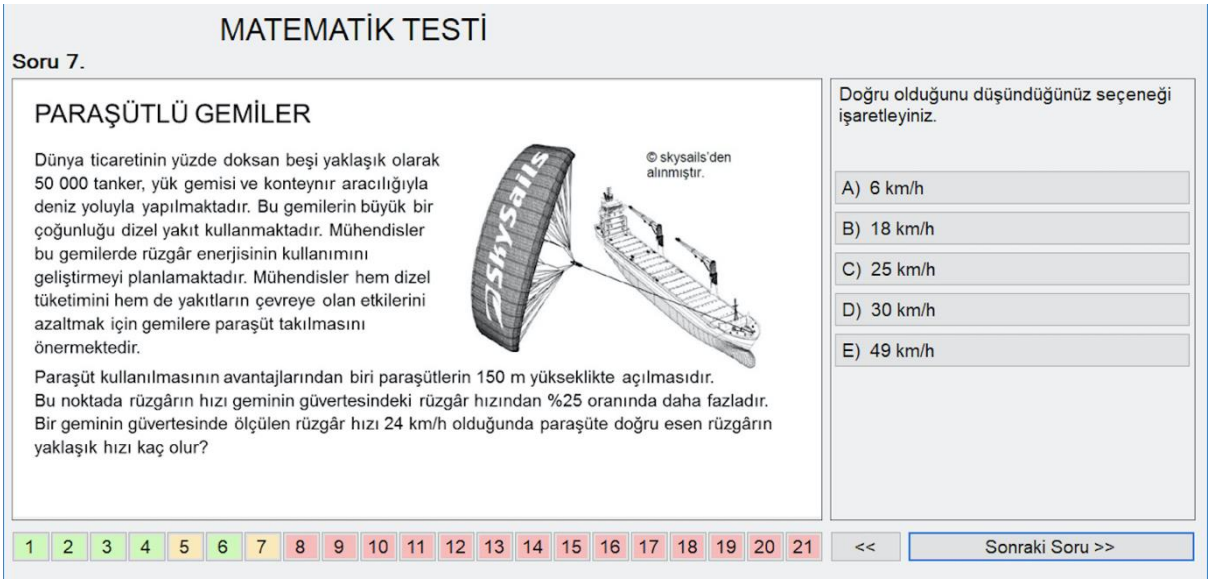
Task and item	Max. score	Type of knowledge*
Charts (item 1)	1	
Charts (item 2)	1	
Sauce (item 1)	1	
Ferris wheel (item 1)	1	PR
Which car? (item 2)	1	
Which car? (item 3)	1	
Revolving door (item 1)	1	
Charts (item 3)	1	
Sailing ships (item 2)	1	
Ferris wheel (item 2)	1	
Climbing Mount Fuji (item 1)	1	PR, CC
Climbing Mount Fuji (item 3)	2	
Helen the cyclist (item 1)	1	
Helen the cyclist (item 2)	1	
Revolving door (item 3)	1	
Sailing ships (item 1)	1	
Sailing ships (item 3)	1	
Climbing Mount Fuji (item 2)	1	PR, CC, CT
Helen the cyclist (item 3)	1	
Garage (item 2)	2	
Revolving door (item 2)	1	

*: The abbreviation PR stands for procedural knowledge, CC stands for conceptual knowledge and CT stands for contextual knowledge.

The categorization of the mathematical literacy items according to the type of knowledge was conducted by the two experts in mathematics education. Then, the percentage of the fit index was calculated as 91.3% by considering the structure in Aydın and Özgeldi (2019). Afterwards, the experts discussed the items which were categorized into different knowledge types and decided to adhere to the structure as indicated in Aydın and Özgeldi's (2019) study.

There were 7 items measuring procedural knowledge, 8 items measuring procedural and conceptual knowledge, and finally 6 items measuring procedural, conceptual, and contextual knowledge. The testing environment was developed by the researchers on Visual Studio and C# programming language was used with the MSSQL database. Before answering the items in the test, the participants were asked to provide descriptive information about their gender, academic grade point average (GPA), and whether or not they took a mathematical modeling course. A screenshot of the testing environment was given in Figure 1.

Figure 1. *The Design of the Testing Environment*



The testing time for the entire test was 60 minutes. After administering the test, the scoring of the responses was completed based on the PISA scoring rubric. Two items were scored out of 2 points so partial credit was applicable in these items whereas the remaining items were worth 1 point. So, the test form measuring procedural knowledge was out of 7 points. On the other hand, the test form measuring both procedural and conceptual knowledge was out of 9 points and the test form measuring all three knowledge types was out of 7 points.

Moreover, semi-structured interviews were conducted to focus on the tests in detail with twenty pre-service teachers who received the lowest total scores and ten randomly selected pre-service teachers who took an elective mathematical modeling course, i.e. 30 pre-service teachers in total. In semi-structured interviews, pre-service teachers were asked to solve and interpret the solutions as if they were performing the application again in the computer-based testing environment, and they were asked to indicate the issues while responding to each item. So, it was possible to focus on the critical points which made the item challenging. During the interviews, the following questions were posed to the participants.

1. Could you explain how you reached your response?
2. What were the item characteristics making the (specific) item challenging?
3. Which items were challenging? How did you struggle with these items? Do you have any specific methods?
4. Did you leave any items unanswered? If yes, what was the reason behind these omitted items?

Data Analysis

After testing the assumptions, independent samples t-test and covariance analysis (known as ANCOVA) were used for the comparisons . The skewness and kurtosis values and the frequency distribution indicated that the dependent variables were approximately normally distributed. Also, the homogeneity of variance assumption was checked by Levene's test for each distribution. These values were not significant indicating that the variances of each group were equal. For ANCOVA, alongside these assumptions, we observed that the covariate was independent of the treatment effects. Moreover, the tests of between-subjects effects indicated non-significant results. Therefore, the homogeneity of the regression slopes was met for the dependent variables.

Finally, Levene's test of equality of error variances showed that error variances of each dependent variable were equal across groups.

The independent samples t-test was conducted to investigate whether the procedural (PR) knowledge scores differ in terms of the variables status of taking elective mathematical modeling course, gender, and academic grade point average. However, the comparisons of conceptual (CC) knowledge scores for these variables were not explicitly set. Instead, covariance analysis (ANCOVA) was conducted by setting procedural and conceptual knowledge (PR-CC) scores as the dependent variable and PR scores as the covariate. In the same manner, to compare contextual (CT) knowledge scores in terms of the fixed factors, another ANCOVA was conducted by taking procedural, conceptual, and contextual knowledge (PR-CC-CT) scores as the dependent variable and PR-CC scores as the covariate. A brief summary of the variables in data analysis was given in Table 2.

Table 2. The Types of Variables in Data Analysis

Fixed factor	Dependent variable	Covariate
Gender	PR score	-
	PR-CC score	PR score
	PR-CC-CT score	PR-CC score
Academic grade point average	PR score	-
	PR-CC score	PR score
	PR-CC-CT score	PR-CC score
Status of taking elective mathematical modeling course	PR score	-
	PR-CC score	PR score
	PR-CC-CT score	PR-CC score

Researchers have proposed several categories of knowledge, including conceptual and procedural knowledge (e.g., de Jong & Ferguson-Hessler, 1996; Hiebert & Lefevre, 1986). Rittle-Johnson and Koedinger (2005) added contextual knowledge and proposed three complementary categories of mathematical knowledge: contextual, conceptual, and procedural. They described contextual knowledge as understanding how things operate in real-world settings, conceptual knowledge as an integrated understanding of key principles, and procedural knowledge as an understanding of the sub-components of a correct technique. A group of experts in mathematics education categorized each released item according to the type of knowledge the solution requires in a preliminary analytical stage prior to data collection.

In the analysis of the semi-structured interviews, Miles and Huberman (1994) used a qualitative data analysis method consisting of three stages: "data reduction", "data representation" and "revealing and verification of results". In the data reduction phase, the raw data were extracted for the purpose of the study, and then the categories and themes were created by encoding the data. Afterwards, the data were visualized with the help of a table or figure. In the stage of revealing and verifying the results, the relationships were interpreted, compared, and contrasted with the literature. In order to ensure reliability, the data obtained from the interview were independently coded by the researchers. For scorer reliability, the number of "agreement" and "disagreement" statuses was determined and Miles and Huberman's (1994) "Reliability = (Agreement) / [(Agreement) + (Disagreement)]" formula was used and the reliability of data analysis of semi-structured interviews was found to be 94%.

Research Ethics

In planning the study researchers had the responsibility to evaluate carefully any ethical concerns. Three issues were addressed in the study by the researchers. First of all, there were not any situations that had to be handled about the protection of participants from harm. Secondly, the confidentiality of research data was ensured. Finally, researchers conducted the study using methods that do not require deception.

FINDINGS

The results would be expressed in terms of the fixed factors: gender, academic grade point average, and the status of taking an elective mathematical modeling course.

Gender

The results of the independent samples t-test analysis showed that there was no significant difference between the PR knowledge scores, $t(111)=.536$, $p=.593$, of the female students ($M=5.74$, $SD=1.08$) and male students ($M=5.61$, $SD=1.36$).

In comparing PR-CC knowledge scores, a one-way ANCOVA was conducted to determine a statistically significant difference between the female and male students on PR-CC knowledge scores controlling PR knowledge scores. The results pointed out that there was no significant difference in mean PR-CC knowledge scores [$F(1,110)=3.900$, $p=0.051$] between female ($M=6.11$, $SD=1.74$) and male students ($M=6.68$, $SD=1.89$).

Another one-way ANCOVA was conducted to determine a statistically significant difference between the female and male students on PR-CC-CT knowledge scores controlling PR-CC knowledge scores. The results of this analysis indicated that there was also no significant difference in mean PR-CC-CT knowledge scores [F(1,110)=1.253, p=0.266] between female (M=1.99, SD=1.09) and male students (M=2.39, SD=1.31).

Academic Grade Point Average

The results of the analysis showed that there was no significant difference between the PR knowledge scores, t(111)=.152, p=.879 of the students having higher academic success (M=5.72, SD=1.14) and the students having lower academic success (M=5.69, SD=1.18).

In comparing PR-CC knowledge scores, a one-way ANCOVA was conducted to determine a statistically significant difference between the students having higher and lower academic success on PR-CC knowledge scores controlling PR knowledge scores. The results pointed out that there was no significant difference in mean PR-CC knowledge scores [F(1,110)=1.099, p=0.297] between the students having higher (M=6.43, SD=1.75) and lower (M=6.09, SD=1.84) academic success.

Another one-way ANCOVA was conducted to determine a statistically significant difference between the students having higher and lower academic success on PR-CC-CT knowledge scores controlling PR-CC knowledge scores. The results showed that there was also no significant difference in mean PR-CC-CT knowledge scores [F(1,110)=.148, p=0.701] between the students having higher (M=2.09, SD=1.11) and lower (M=2.10, SD=1.22) academic success.

Mathematical Modeling

The results of the analysis showed that there was no significant difference between the PR knowledge scores, t(111)=1.530, p=.129 of the students who took the mathematical modeling course (M=5.91, SD=1.04) and the students who did not (M=5.57, SD=1.21).

In comparing PR-CC knowledge scores, a one-way ANCOVA was conducted to determine a statistically significant difference between the students who took the mathematical modeling course and who did not on PR-CC knowledge scores controlling PR knowledge scores. The results pointed out that there was no significant difference in mean PR-CC knowledge scores [F(1,110)=1.977, p=0.160] between the students who took the mathematical modeling course (M=6.67, SD=1.85) and the students who did not (M=6.00, SD=1.72).

Another one-way ANCOVA was conducted to determine a statistically significant difference between the students having higher and lower academic success on PR-CC-CT knowledge scores controlling PR-CC knowledge scores. The results showed that there was a statistically significant difference in mean PR-CC-CT knowledge scores [F(1,110)=4.861, p=0.030] between the students who took the mathematical modeling course (M=2.47, SD=1.24) and the students who did not (M=1.85, SD=1.06).

Difficulties in PISA Mathematical Literacy Items

Before the interviews, item analysis was conducted to observe the item-specific difficulties. Table 3 indicated full credit, partial credit (if applicable), and no credit percentages.

Table 3. Full Credit, Partial Credit, and No Credit Percentages of Mathematical Literacy Items

Task and item	Full credit	Partial credit	No credit	Type of knowledge
Charts (item 1)	92.0%	-	8.0%	
Charts (item 2)	89.4%	-	10.6%	
Sauce (item 1)	91.2%	-	8.8%	
Ferris wheel (item 1)	70.8%	-	29.2%	PR
Which car? (item 2)	88.5%	-	11.5%	
Which car? (item 3)	64.6%	-	35.4%	
Revolving door (item 1)	74.3%		25.7%	
Charts (item 3)	87.6%	-	12.4%	
Sailing ships (item 2)	61.9%	-	38.1%	
Ferris wheel (item 2)	76.1%	-	23.9%	
Climbing Mount Fuji (item 1)	77.9%	-	22.1%	PR, CC
Climbing Mount Fuji (item 3)	42.5%	12.4%	45.1%	
Helen the cyclist (item 1)	86.7%	-	13.3%	
Helen the cyclist (item 2)	65.5%	-	34.5%	
Revolving door (item 3)	73.5%	-	26.5%	
Sailing ships (item 1)	85.8%	-	14.2%	
Sailing ships (item 3)	18.6%	-	81.4%	
Climbing Mount Fuji (item 2)	58.4%	-	41.6%	PR, CC, CT
Helen the cyclist (item 3)	24.8%	-	75.2%	
Garage (item 2)	7.1%	6.2%	86.7%	
Revolving door (item 2)	1.8%	-	98.2%	

Looking at the items that preservice teachers have had the most difficulties with, it is seen that there are questions used in three types of knowledge. The codes were obtained from the opinions of the preservice teachers who were asked why they had difficulties, especially in the questions that they have difficulty with: “not translating the contextual knowledge from a real-world setting to the mathematical model”,” lacked reasoning about the context”, “not understanding the context of the problem”, “not creating arguments on these matters” constitutes the type of contextual knowledge theme. This theme is supported by the sample pre-service teacher views below. Preservice teachers were coded as PT01, PT02,…PT113.

"It was difficult to express the answer to the questions by supporting them with reasons for writing, and it was difficult to express them because the questions that required explanation in a linguistic logical cycle were challenging because we were used to explaining them with mathematical symbols." PT34

“We are used to mathematically using ready-made algorithms in our minds that I had a hard time interpreting according to the problem situation given to us” PT23

“For example, in the revolving door, maybe the math we will use is easy, but trying to interpret it with what is explained in the question was really challenging.” PT48

It was observed that randomly selected preservice teachers taking elective mathematical modeling lessons made mostly operational errors in problems. When asked how they interpreted the questions that the majority of pre-service teachers could not do, it was found that they presented familiarity with "mathematical reasoning", "communication" and "modeling process". These issues are supported by pre-service teachers' representative views below.

“… It was not challenging to write a description for questions that contain the context of this daily life because I was able to interpret it more easily because we made these explanations in the presentation sections for each question in the modeling lesson.” PT07

“The transition from real life to mathematical model in modeling questions, perhaps the dominance in comparing the model we created with real life situation helped me solve these questions” PT52

"The explanation part was not challenging, because I supported and presented our mathematical arguments by discussing in the modeling lesson, I can say that I have run similar processes in these questions." PT19

DISCUSSION & CONCLUSION

The mathematical literacy or competence notion in PISA (OECD, 2014) deals with the capacity of students to analyze, reason, and communicate efficiently as they pose, formulate, solve and interpret mathematical problems in a variety of situations. In this study, pre-service mathematics teachers’ mathematical literacy skills were analyzed according to gender, academic grade point average, and mathematical modeling within the scope of procedural, conceptual, and contextual items. At the same time, semi-structured interviews were held to reveal their difficulties in solving PISA mathematical literacy items.

The results of this analysis indicated that there was no significant difference in mean PR-CC-CT knowledge scores, PR-CC knowledge scores, and PR knowledge scores between female and male students. The results showed that there was also no significant difference in mean PR-CC-CT knowledge scores, PR-CC knowledge scores, and PR knowledge scores between the students having higher and lower academic success. When it is examined according to whether or not to take an elective mathematical modeling course, the results of the analysis showed that there was no significant difference between the PR knowledge scores. Also, the results pointed out that there was no significant difference in mean PR-CC knowledge scores between the students who took the mathematical modeling course and the students who did not. However, the results showed that there was a statistically significant difference in mean PR-CC-CT knowledge scores between the students who took the mathematical modeling course and the students who did not.

The findings are consistent with Rittle-Johnson and Koedinger's (2005) theoretical approach, but they also show that categorizing PISA items according to mathematical knowledge types can aid in understanding the links between contextual, conceptual, and procedural knowledge. Contextual knowledge is shown to be a vital link between conceptual and procedural knowledge in the current study and thus serves as an important tool for solving the most difficult items, particularly those that require more than a simple reproduction of definitions and algorithms. In Rittle-Johnson and Koedinger (2005)'s study, it is argued that the benefits of real-life circumstances come because they give alternate approaches and/or informal solution methodologies, and therefore elicit improved problem comprehension. Furthermore, Saenz (2009) investigated the difficulties pre-service teachers experienced while solving PISA questions and reached the conclusion that evaluating the mathematics skills of

pre-service teachers requires assessment of school mathematics as contextual, conceptual, and operational. The study showed that contextual knowledge about the real world is important in terms of establishing a relationship between the use of skills needed to solve PISA questions and traditional school mathematics expressed by concepts and processes. In the study, it was observed that pre-service teachers had difficulties in expressing their mathematical arguments about the solution and instead used their mother tongue. In addition, pre-service teachers, who were found to have difficulties in interpreting graphics, expressed their personal opinions about the context of the problem as a solution without any mathematical judgment about the question.

This contextual knowledge plays a key role in the following ways. It is possible to say that it provides vital guidance to students in the selection of several alternative techniques. Contextual information can help learners choose between alternate procedures that function in the same settings as procedural knowledge. Furthermore, contextual knowledge can aid learners in evaluating a cognitive network in a challenge in which the relationships between nodes are as significant as the discrete pieces of information that make up these nodes concerning the relevance of known procedures to real-world circumstances. It was discovered in this study that preservice teachers who did not take the mathematical modeling course and who have limited contextual knowledge about how things work in everyday life are more likely to choose incorrect procedures and fail to transform the known procedure for use in the specific situation. On the other hand, it was discovered that preservice teachers who took the mathematical modeling course gained experience in questions involving contextual knowledge about how things work in everyday life, which may have led them to choose correct procedures more frequently and successfully transform the known procedure for use in the specific situation. The result of this study was highlighted in Widjaja (2011)'s study with pre-service teachers in which the potential of PISA questions for pre-service teachers were investigated. It has been concluded that such contextual questions offer various strategies and that such questions enable pre-service teachers to experience the power of mathematics in their daily life contexts. It was also stated that giving contextual questions and mathematical modeling as part of the pre-service teachers' training will increase the capacity of future teachers to plan and apply lessons to improve mathematics literacy and these kinds of problems should be included in teacher education programs. As a result, it was stated that providing pre-service teachers with such learning experiences in their education would better equip them to use their mathematical knowledge and skills in real life. In light of these studies, the fact that the mathematical modeling course is a compulsory course in Turkey's renewed program in elementary mathematics education can be considered a positive development in this respect. In this sense, teaching through comprehension and promoting the achievement of new educational goals such as the development of higher-order thinking skills, particularly problem-solving skills, should be at the forefront in the classrooms, rather than teaching based on the transmission of knowledge. Mathematics instructors' knowledge and practices in terms of issues, results, and viewpoints should be founded on contextual knowledge. Effective teachers are required to help students employ techniques and build their own strategies that can help them solve many types of problems.

Findings from semi-structured interviews highlight the challenges, particularly in argumentation and communication and modeling competencies. In the studies in the literature, this situation was handled from different perspectives. It is seen that the difficulty of expressing mathematical expressions arising in this study is handled in different studies. According to the studies, linguistic challenges appear to be one of the most important factors contributing to students' low performance on specific mathematical tasks (Movshovitz-Hadar, Zaslavsky & Inbar, 1987; Radatz, 1980). Since PISA poses challenges by presenting a situation of a personal, employment, or scientific nature, it appears normal to believe that linguistic difficulties can have a substantial impact on PISA competencies such as argumentation and communication, which require a command of the natural language. Furthermore, PISA is based on certain competencies evaluating students' total ability (mathematical literacy). Competencies are cognitive processes that need to be triggered in order to connect the actual world with mathematics and solve the problem at hand. These issues, according to the pre-service instructors in this study, are related to the difficulty in formulating and articulating mathematical reasoning, as well as expressing oneself in a variety of ways on matters of mathematical content, and monitoring and managing the modeling process. These signs point to argumentation, communication, and modeling skills. Knowing what mathematical proofs are and how they differ from other sorts of mathematical reasoning, following and evaluating chains of different types of mathematical arguments, developing intuitive processes, and inventing and articulating mathematical arguments are all part of argumentation. Communication entails expressing oneself in a number of ways, both orally and in writing, on subjects with a mathematical element, as well as understanding others' written or oral remarks on such matters. Modeling entails structuring the situation to be modeled, translating "reality" into mathematical structures, working with a mathematical model, validating the model, reflecting, analyzing, and criticizing the model and its

results, effectively communicating about the model and its results, and monitoring and controlling the modeling process. Taking into account the content of these competencies, which includes the problems that were mentioned by preservice teachers in this study.

Statements of Publication Ethics

Ethical permission for the research was approved by Niğde Ömer Halisdemir University Ethics Committee. The ethics committee document number is 2021/15-01.

Researchers' Contribution Rate

All authors contributed equally rate to the research.

Conflict of Interest

The authors confirm that there are no conflicts of interest associated with this study.

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Bartın University Journal of Faculty of Education BUEFAD

2023, Volume 12, Issue 1, 190-199
dergipark.org.tr/buefad
DOI: 10.14686/buefad.1040614

The Effect of Emotional Intelligence on Cyber Security: The Mediator Role of Mindfulness

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Research Article
Received: 23.10.2021
Revised: 26.01.2022
Accepted: 26.01.2022

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ABSTRACT

The aim of the study was to examine the effect of emotional intelligence on cyber security and the role of mindfulness in this effect. The sample of the study is consisted of 342 (66.5%) females and 172 (33.5%) males. According to their ages, there are 243 (47.3%) people between the ages of 18-24, 166 (32.3%) between the ages of 25-34, 68 (13.2%) people between the ages of 35-44, 37 (7.2%) people aged 45 and over. In this study, it was used "Emotional Intelligence Scale", "Mindfulness Scale" and "Personal Cyber Security Provision Scale". The study was conducted with the relational survey model. Unstandardized beta values that obtained from the study will be seen as follows: β=0.15 [0.08, 0.23] the direct effect of emotional intelligence on mindfulness, β=0.15 [0.08, 0.23] the direct impact of Mindfulness on Cyber Security, β=0.07 [0.03, 0.10] the indirect effect of Emotional Intelligence on Cyber Security. All effects obtained were found to be significant ($p<0.001$). As a result of the analyzes, it was found that emotional intelligence affected mindfulness positively and cyber security. Furthermore, it was revealed that emotional intelligence directly and indirectly affected cyber security positively, and mindfulness played a partial mediator role in this effect.

Keywords: Cyber security, emotional intelligence, internet technology, mediation effect, mindfulness

The Effect of Emotional Intelligence on Cyber Security: The Mediator Role of Mindfulness

ÖZ

Bu araştırmanın amacı duygusal zekânın siber güvenlik üzerine etkisini ve bu etkide bilinçli farkındalığın aracı rolünü incelemektir. Araştırma Türkiye'nin çeşitli illerinde yaşayan yetişkinler üzerinde gerçekleştirilmiştir. Araştırmaya 342 (%66.5) kadın, 172 (%33.5) erkek olmak üzere 514 kişi katılmıştır. Yaşlarına göre katılımcılardan 243 (%47.3) kişi 18-24 yaş aralığında, 166 (%32.3) kişi 25-34 yaş aralığında, 68 (%13.2) kişi 35-44 yaş aralığında, 37 (%7.2) kişi 45 yaş ve üzerindedir. Araştırmada "Duygusal Zekâ Ölçeği", "Bilinçli Farkındalık Ölçeği" ve "Kişisel Siber Güvenliği Sağlama Ölçeği" kullanılmıştır. Araştırma ilişkisel tarama modeli ile gerçekleştirilmiştir. Araştırmadan elde edilen standardize edilmemiş beta değerleri: Duygusal zekânın bilinçli farkındalık üzerine doğrudan etkisi β=0.42, bilinçli farkındalığın siber güvenlik üzerine doğrudan etkisi β=0.15, duygusal zekânın siber güvenlik üzerine dolaylı etkisi β=0.07 [0.03, 0.10] olarak elde edilmiştir. Elde edilen tüm etki büyüklükleri anlamlı bulunmuştur ($p<0.001$). Sonuç olarak; duygusal zekânın bilinçli farkındalığı pozitif, bilinçli farkındalığın siber güvenliği pozitif yönlü etkilediği bulunmuştur. Ayrıca duygusal zekânın siber güvenliği doğrudan ve dolaylı olarak pozitif yönlü etkilediği ve bu etkide bilinçli farkındalığın kısmi aracı rol üstlendiği ortaya konmuştur.

Anahtar kelimeler: Siber güvenlik, duygusal zekâ, internet teknolojisi, aracı etki, bilinçli farkındalık

To cite this article in APA Style:
Seki, T., Çimen, T., & Dilmaç, B. (2023). The effect of emotional intelligence on cyber security: The mediator role of mindfulness. *Bartın University Journal of Faculty of Education, 12*(1), 190-199. https://doi.org/10.14686/buefad.1040614

INTRODUCTION

Internet technology and its foundations of which were laid in the 1950s has gradually become widespread and it has become one of the main factors affecting the 21st century. Today, internet technology has eliminated the distance between continents and has enabled the world to be called as "global village". The use of Internet has become very common in our country in accordance to the world. As much as the rate of internet access of residences in our country was 30% in 2009, this rate reached 90.7% in 2020 (TUIK, 2020). Internet technology provides many facilities in our lives. In addition to the opportunities offered by the internet, it also brings various security risks for users. The risks of using the Internet are created by the abuse of the possibilities of this area by many malicious people. In order to prevent it, there are various control mechanisms including both technology-oriented and non-technology-oriented. There are various technological software and programs, non-technology-oriented interventions, legal enforcement, legislation, civil actions, education, individual awareness, and attention (Kim et al., 2011). However, despite all these security measures, studies have shown that 86.3% of children use the internet unsafely (Valcke et al., 2010). Adults' protective behaviors are insufficient and their awareness is low (Öğütçü, 2010). In addition, many people are not aware of the risks of sharing their personal information on the internet with people who do not know (Young, 2008).

The public services are accessible with internet technology, and the role of public and private institutions in information technologies are increasing gradually and increasing security risks are too (Bıçakcı et al., 2015). The measures of security that the state, institutions, and individuals should take to ensure information security brought the concept of cyber security to the agenda (Choucri, 2012; cited in Tarhan, 2017). The concept of cyber security covers all communication providers and means ensuring the confidentiality, accuracy, and usability of information as well as an internet-oriented security provider (Hekim & Başıbüyük, 2013). It requires the use of opportunities besides maintaining existing systems. It also encompasses various tasks such as internet administration, trade policy, counter-terrorism, and security intelligence. In this respect, the concept of cyber security is a very important national security mechanism (Klimburg, 2012).

Along with the technical measures to be taken to prevent cyber security threats, ignoring the human factor in providing cyber security will render the measures taken ineffective. For this reason, the awareness of individuals plays an important role in ensuring their safety (Yılmaz et al., 2016). At that point, awareness is a radar that constantly scans the inner and outer environment working in the background of consciousness. Mindfulness includes both awareness and attention. Attention takes images from the ground of awareness and keeps them in focus for a while. Thus, attention and awareness are intertwined (Brown & Ryan, 2003). In this context, mindfulness is the state of being fully awake and active in the moment. In other words, it is to live in the present by directing attention in another direction (Özyeşil et al., 2011). It is a person's awareness of the information coming from the environment and paying attention to the situation that needs to be interpreted (İlhan & Esentürk, 2015). It can be said that awareness plays an important role in behavior and attitude by directing the person to the right behavior and attitude over time (Demir & Cicioğlu, 2020; Hutton & Baumeister, 1992).

Most of the security breaches, which cost companies an average of $6.75 million in the USA, was reported as employees' lack of mindfulness of security policies (Parrish & Nicolas-Rocca, 2012). Accordingly, it was reported that there is a positive relationship between low mindfulness and the dissemination of private data and personal information without a bad intention. Mindfulness, which is defined as an increasing attention to the events around us, is effective in preventing security violations (Landress, 2018). In addition, eliminating the lack of infrastructure in the prevention of cybercrime, which increases with the spread of the use of wireless technologies and increasing the bandwidth, and effective policy implementation and measures by the states will also be effective in ensuring cyber security (Von Solms & Kritzinger, 2012).

By means of mindfulness, individuals can perceive their own and others' emotions correctly and regulate them effectively. Mindfulness brings clarity and vitality to everyday experiences and encourages momentary emotional contact with life. In this way, the basic aspects of mindfulness can make the development of competencies involving emotional intelligence (Schutte & Malouff, 2011). The components of mindfulness allow individuals to effectively perceive, regulate, and ultimately understand emotions in themselves and others. Emotional intelligence is conceptualized as the ability to perceive, use, understand and manage emotions (Mayer et al., 2008). It is related to the emotion management component of emotional intelligence and the self-regulating function inherent in mindfulness (Brown et al., 2007). Therefore, awareness plays an important role in facilitating interpersonal awareness and using emotions, which are the basic components of emotional intelligence (Schutte

& Malouff, 2011). Moreover, it was reported in literature that people with high emotional intelligence have a high level of mindfulness (Baer et al., 2004; Brown & Ryan, 2003; Sinclair & Feigenbaum, 2012).

Recent studies have shown that individuals with high emotional intelligence have a decreased use of problematic internet (Reisoğlu et al., 2013) and an increased level of coping with cyberbullying (Eliçora, 2020). In addition, it was revealed that mindfulness plays a fully mediating role in the relationship between emotional intelligence and internet addiction (Cankurtaran & Şakiroğlu, 2020). It was also reported in literature having high awareness has an impact on cyber security behaviors in individuals (Kritzinger & Solms, 2010). In the globalizing and digital transformation world, internet-based applications such as information technologies, online services and social networks have gained importance and developed very rapidly in recent years (Öztabak, 2018). As mentioned above, it is seen that the awareness and emotional intelligence levels of the users are effective in the conscious use of online applications. With the effect of globalization the security of users in the virtual world gains importance. It is thought that the conscious awareness and emotional intelligence of users are effective in cyber security behaviors, but no study has been found in literature. Therefore, considering these relationships, the hypotheses of this research can be expressed as follows:

1. Emotional intelligence is a predictor of cyber security behaviors.
2. Mindfulness is a predictor of cyber security behaviors.
3. Mindfulness has a mediator role in the relationship of cyber security with emotional intelligence and mindfulness.

METHOD

This section may include research design, the study group, data collection tools and data analysis.

Research Design

The purpose of this study was to examine the effect of emotional intelligence on cyber security and the mediating role of mindfulness in this effect. For this purpose, a correlational survey model was used in the research. Relational screening model; It is a research model that aims to determine the presence and/or degree of co-variance between two or more variables (Büyüköztürk et all., 2009).

Study Group

514 people from different regions of Turkey participated in the research. 342 of the participants (66.5%) were women and 172 of them (33.5%) were men. When the ages of the participants are examined, there are 243 (47.3%) people between the ages of 18-24, 166 (32.3%) between the ages of 25-34, 68 (13.2%) people between the ages of 35-44, 37 (7.2%) people aged 45 and over. Finally, when the educational status of the participants are examined, there are 45 (8.8%) graduated, 335 (65.2%) graduated from the university, 97 (18.9%) graduated from the high school, 33 (6.4%) graudated from the primary school, and 4 (.8%) literated.

Data Collection Tools

Emotional Intelligence Scale-Short Form, Mindful Attention Awareness Scale, Personal Cyber Security Provision Scale and Personal Information Form were used in this study.

Personal Information Form: This form was prepared by the researchers to determine the characteristics of the participants such asgender, age and educational status.

Emotional Intelligence Scale-Short Form: The scale was translated into Turkish by Deniz et al., (2013) to determine the level of perception of the individual's emotional competencies. The scale consists of 16 items and 4 sub-dimensions. The total variance explanation rate of the scale is 60.8%. The Cronbach's alpha coefficients of this scale were found to be .72 for the well-being factor, .70 for self-control, .66 for emotionality, .70 for sociability, and .81 for the whole scale. In addition, as a result of the test-retest reliability studies, the correlation level was found to be .86. In the study, the Cronbach's alpha value of the scale was obtained as .73.

Mindful Attention Awareness Scale: The scale was adapted into Turkish by Özyeni et al. (2011). The scale consists of 15 items and one dimension. The item factor loads of the scale ranged from .48 to .81. The Cronbach alpha internal consistency coefficient of the scale was calculated as .80 and the test-retest correlation was calculated as .86. In the study, the Cronbach's alpha value of the scale was .89.

Personal Cyber Security Provision Scale: The scale was developed by Erol et al., (2015) to determine the cybersecurity-related behaviors of internet users. The scale consists of 25 items and 5 sub-dimensions. The total variance explanation rate of the scale is 48%. The Cronbach alpha coefficient of the scale was found as .76 for protection of personal privacy, .77 for avoiding untrusted, .70 for taking precaution, .82 for protection of payment

information, .56 for not leaving a trace, and 0.73 for the overall scale. In the study, the Cronbach's alpha value of the scale was obtained as .77.

Data Collection

Before starting the research, ethical approval was obtained from the Social and Human Sciences Ethics Committee of Necmettin Erbakan University (19/03/2021, No:2021/159). The data were collected online such asFacebook, WhatsApp and Instagram because of the pandemic. The informed consent form was given on the first page of the study, and electronic consent of the participants was obtained. Demographic information form and scales were applied electronically. The research was carried out on volunteer participants over the age of 18.

Data Analysis

In the study, firstly missing data analysis was performed. SPSS package program was used to calculate frequency, percentage, standard deviation, mean, correlation, and Cronbach's alpha values. In order to test the normal distribution of the data, the skewness and kurtosis values of the variables were calculated first. Direct and indirect effects between the variables were realized with SPSS PROCESS (Hayes, 2018). Bootstrapping was performed with 5,000 samples and a 95% confidence interval (Montoya & Hayes, 2017). In this study, we followed these recommendations for mediation analysis: (i) emotional intelligence must be connected to cyber security, (ii) mindfulness must be connected to cyber security (iii) emotional intelligence must be connected to mindfulness, (iv) there must be a statistically significant decrease in the impact of emotional intelligence on cyber security when mindfulness is controlled.

FINDINGS

In this part of the research, first of all, descriptive statistics and correlation results of emotional intelligence, mindfulness, and cyber security variables were given. Then, the model of the direct and indirect effects between these variables was tested.

Descriptive Statistics and Correlation Results

The mean, standard deviation, skewness and kurtosis values, and Cronbach's alpha coefficients and correlation values were given in Table 1. It was observed that the skewness and kurtosis values were in the range of ±1.96 and it showed a normal distribution (Karagöz, 2016). All Cronbach's alpha coefficients were found to be sufficient because they were 0.70 and above (Pallant, 2016). A moderate positive correlation was found between emotional intelligence and mindfulness ($r = 0.50$, $p<.001$), between emotional intelligence and cyber security ($r = 0.36$, $p<.001$), and mindfulness and cyber security ($r = 0.33$, $p<.001$).

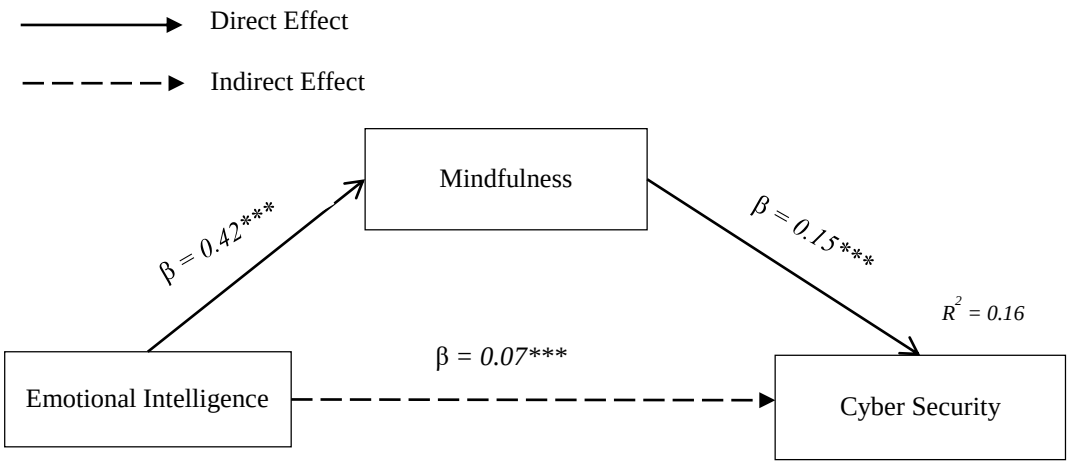
Table 1. Descriptive statistics, Reliability values, Correlation results

	α	M	SS	Skew.	Kurt.	1	2	3
1. Emotional Intelligence	.73	93.37	17.36	.12	-.35	-		
2. Mindfulness	.89	57.72	14.91	-.28	-.35	.50**	-	
3. Cyber Security	.77	92.85	11.81	-.18	-.42	.36**	.33**	-

***p*< .001

Testing the Mediator Effect Model

The model regarding the mediating role of mindfulness in the effect of emotional intelligence on cyber security is shown in Figure 1. The Cronbach Alpha value of the scales used in the research was found 0.73 for emotional intelligence scale, 0.89 for mindfulness scale and 0.77 for cyber security scale. This study obtained correlations that are r=0.50 between emotional intelligence and mindfulness, r= 0.36 between emotional intelligence and cyber security, r=0.33 between mindfulness and cyber security. As a result of bootstrapping, it was observed that emotional intelligence had a significant effect on mindfulness ($\beta = 0.42$, $t = 13.06$, $p < .001$). Similarly, mindfulness was found to have a positive effect on cybersecurity ($\beta = 0.15$, $t = 4.12$, $p < .001$). In addition, an indirect effect of emotional intelligence on cybersecurity was found ($\beta = 0.07$, CI = 0.03, 0.10). In the research, it was seen that mindfulness plays a mediating role in the effect of emotional intelligence on cyber security. In addition, it was determined in the study that emotional intelligence and mindfulness explained 16% of the variance (R^2) regarding cyber security (Figure 1).



***p < .001
β = non-standardized coefficient of influence

Figure 1. *Structural Model*

DISCUSSION & CONCLUSION

Nowadays with the transfer of transactions such as banking and public services to an interactive environment the widespread use of information technologies, which are at the center of our lives, has made these transactions open targets for attack (Doherty et al., 2009). The fact that the information circulation network, which is very important in general and, is moved to an interactive environment with this prevalence for the elimination of cyber security threats and the safe use of this network (Vural & Sağıroğlu, 2008). In this sense, cyber security covers comprehensive security that covers not only the internet but also all communication infrastructures (Hekim & Başıbüyük, 2013). The human factor is the weakest link among the factors to ensure this security. In general, even if all security measures are taken, human-induced vulnerabilities can also invalidate these measures. For this reason, it is considered to raise awareness of people about this issue and to determine their awareness (Vural & Sağıroğlu, 2008).

Education and awareness are fundamental parts of all information security cultures (Glaspie & Karwowski, 2017). Accordingly, regardless of hardware and software, an uneducated and low-aware user becomes the carrier of a cyber-attack (Badie & Lashkari, 2012). Öğütçü et al., (2016) revealed that when more technology users perceive threats,more their awareness of the world of technology increases and more efficient their security behaviors become. Chen & Zahedi (2016) revealed that users tend to take security measures when they perceive or experience cyber threats. Jensen et al., (2017) highlighted that users who received mindfulness training were better protected from attacks they were exposed from the internet. Accordingly, the fact that individuals have high mindfulness provides the opportunity to get rid of mental confusion by being aware of the events around them and to use the internet better by focusing attention on positive areas (Peker et al., 2019).

Mindfulness is the state of focusing on the events happening around us in an accepting way without judgment (Brown & Ryan, 2003) and the opportunity to be fully alive and awake (Germer et al., 2005). Thus, it enables the individual to perceive the emotions of himself and those around him, and thus to regulate the individual's emotion (Koole, 2009). In this respect, mindfulness, perceiving, regulating, and managing emotions are highly related to emotional intelligence (Petrides & Furnham, 2000). Since individuals with low emotional intelligence are more likely to experience both social and psychological problems (Mavroveli et al., 2007), it was revealed that they have a high tendency to escape from real life and be more active in the virtual environment ,and emotional intelligence is a protective factor against problematic use of internet (Beranuy et al., 2009).

A low level of emotional intelligence facilitates online use of individuals, and they are more likely to experience high psychological and interpersonal problems (Petrides at all., 2016). Having a socio-emotional system that reduces the tendency of individuals to risky activities such as problematic technology use individuals to control their emotions and to have cognitive control over these emotions. Thus, it is an important preventive factor against exhibiting problematic behaviors (Shulman, et al., 2016). Moreover, it has been reported that

mindfulness has a mediating role because individuals with high awareness have the capacity to manage and regulate their emotions by being more aware of their emotional states (Kircaburun , Griffiths & Billieux, 2019). Individuals with a high level of awareness along with emotional intelligence have more sufficient resources to cope with their problems (Petrides, Gomez & Perez-Gonzalez, 2017). In literature, it has been revealed that emotional intelligence and mindfulness are positively related (Baer et al., 2004; Bao et al., 2015; Deniz et al., 2017; Griebel, 2015; Schutte & Malouff, 2011; Sinclair & Feigenbaum, 2012; Teal et al. , 2018; Wang and Kong, 2013).

In this study it was revealed that mindfulness plays a mediating role between cyber security behaviors and emotional intelligence. In this respect, it contributes to the literature by considering the cyber security behaviors of the participants in terms of emotional intelligence and mindfulness. However, these results have some limitations that should be considered while interpreting. These are the limited generalizations of the study sample with only the inclusion of various provinces of Turkey. Another limitation is that the study has a cross-sectional structure. Therefore, in future studies it is recommended that researchers reach a larger sample by considering these issues and test results of the research with longitudinal studies. Considering the results of the study, it is recommended for practitioners to carry out studies to increase the conscious awareness of users and to detect and develop their emotional intelligence in ensuring cyber security of users in the virtual environment.:

Statements of Publication Ethics

The research was conducted in accordance with the 1964 Declaration of Helsinki and ethical standards. Informed consent was obtained from all participants participating in the study. Before starting the research, ethical approval was obtained from the Social and Human Sciences Ethics Committee of Necmettin Erbakan University (19/03/2021, No:2021/159). This study was not funded by any organization or institution.

Researchers' Contribution Rate

The first author contributed to the method, data analysis, reporting, summary, and general arrangement. The second author contributed to the design of the research, introduction, data collection, discussion, and bibliography. The third author contributed to the design and discussion of the data and provided review and feedback to the research.

Conflict of Interest

The authors declare that there are no conflicts of interest associated with this paper.

Acknowledgement

This research was presented as an oral presentation at the 22nd International Psychological Counseling and Guidance Congress (2021).

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BARÜ Bartın University Journal of Faculty of Education BUEFAD

2023, Volume 12, Issue 1, 200-217
dergipark.org.tr/buefad
DOI: 10.14686/buefad.1034256

Predictors of Students' Low and Basic Performance Levels in PISA Turkey Implementations

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Research Article
Received: 08.12.2021
Revised: 12.10.2022
Accepted: 08.11.2022

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ABSTRACT

The aim of study is to determine the year-by-year change of family and student characteristics of whose performance is at or below basic proficiency level in domain of reading comprehension on PISA Turkey 2012, 2015 and 2018 implementations. This study is designed as a correlational survey research and also covers a secondary data analysis. Data was obtained from the official website of OECD. For data analysis, descriptive statistics and logistic regression analysis were used. Based on the research findings, it was seen that low performing students have started to come from better educated families as well as families with higher ESCS index. Resources available to students increased by years. Logistic regression analysis revealed that various variables are classifiers for students' performance levels for each implementation years. Some findings are found to be contradictory with the literature such as predictive role of maternal education level and educational software. Suggestions are made based on the findings to improve students' performances from low to at least basic proficiency levels.

Keywords: Family characteristics, Logistic regression, Low performing students.

Predictors of Students' Low and Basic Performance Levels in PISA Turkey Implementations

ÖZ

Bu çalışmanın amacı PISA 2012, 2015 ve 2018 yılları Türkiye uygulamalarında okuduğunu anlama alanında düşük ve temel performans düzeylerinde performans gösteren öğrencilerin, kendi özelliklerinin ve aile özelliklerinin yıldan yıla değişiminin tespit edilmesidir. Bu çalışma ilişkisel tarama modelinde tasarlanmıştır ve aynı zamanda bir ikincil veri analizi çalışmasıdır. Veri OECD resmi internet sayfasından elde edilmiştir. Veri çözümleme süreci için betimsel istatistikler ve lojistik regresyon analizi kullanılmıştır. Araştırma bulgularına dayalı olarak, düşük performans gösteren öğrencilerin yıldan yıla daha iyi eğitimli ve daha yüksek sosyoekonomik ve kültürel düzeye sahip olan ailelerden gelmeye başladıkları görülmektedir. Uygulama yılları boyunca öğrenciler için mevcut imkanlar gelişim göstermiştir. Lojistik regresyon analizi sonuçları her bir uygulama yılı için sınıflayıcı olan değişkenlerin çeşitli olduğunu ortaya çıkartmıştır. Anne eğitim düzeyi ve eğitsel yazılım gibi değişkenlerin yordayıcı rolüne ilişkin bazı bulguların alanyazınla çelişkili olduğu görülmüştür. Bulgulara dayalı yorumlar öğrenci düşük performansının en azından temel performans düzeyine doğru geliştirilebilmesi hususu göz önünde tutularak yapılmıştır.

Anahtar kelimeler: Aile özellikleri, Lojistik regresyon, Düşük başarılı öğrenciler.

To cite this article in APA Style:
Kutlu, Ö., & Özyeter, N. T. (2023). Predictors of students' low and basic performance levels in PISA Turkey implementations. *Bartın University Journal of Faculty of Education, 12*(1), 200-217. https://doi.org/10.14686/buefad.1034256

INTRODUCTION

Student success is an issue that needs to be examined at the individual and national level. Societies want to raise successful individuals to increase the happiness and living standards of their citizens and to ensure socioeconomic and sociocultural progress. However, for many reasons, it is not possible to achieve this goal at the targeted level. Many countries are conducting projects to determine the causes of this problem and to take the necessary measures. Some of these projects involve large-scale standard tests administered to determine student achievement. The findings obtained from these guide education decisions at the national level. However, countries mostly determine the characteristics of students who get high scores on these tests (OECD, 2016a) and make their education decisions accordingly. This increases the learning differences with the students in the low achievement bracket, and many children lag behind in education. In 1990, the World Declaration on Education for All, which was unanimously accepted by the participating countries, was published. At the conference where this declaration was accepted, the idea that "No Child Left Behind" was discussed and common views were reached on the decisions to be taken (UNDP and UNICEF, 1990). However, the Education for All Global Monitoring Reports prepared by UNESCO states that the decisions taken have not been realized (UNESCO, 2013-4). Increasing the learning success of the students in the low achievement group is an important problem that the Turkish education system needs to solve.

The Program for International Students Assessment (PISA) is carried to determine and monitor the skills of students. In PISA implementations, student performances are determined in terms of their proficiency levels on a scale (OECD, 2019). These levels, which provide information about student performance, are grouped in six dimensions from simple to complex, and proficiencies related to each dimension are defined as an indicator of learning. The basic level is Level 1 while the highest is Level 6.

When performance indicators of reading comprehension are reviewed from OECD (2019), it can be seen that the cognitive performance expected from the student is simpler as the basic proficiency level decreases. The students at the second proficiency level for reading, science and mathematics literacy in OECD are defined as students who are successful at the basic level, and students who fall below this level (Level 1) are defined as students with low achievement (OECD, 2016a). Chakrabarty and Asha (2014) define low-performing students as who do not get the expected scores in the fields they study. Level 1 and below Level 1 are defined as follows in PISA (MEB, 2013).

Level 1: They can answer clearly defined questions with all relevant information about the solution in a familiar context. They can perform routine operations by following the given instructions and have the ability to write some amount of information. Below Level 1: They can read a number in a very clearly stated simple notation, have the skills to perform some very simple operations with natural numbers.

When the reports prepared based on the PISA results are examined (OECD, 2016a), it can be observed that all the countries have low performing students, in other words, students that cannot perform at a basic level in any learning domain. Singapore is one of the countries that has rapidly increased its student success rate in PISA implementations with its recent reforms in education. Compared to Turkey, the percentage of students at Level 1 and below in Singapore in PISA 2015 is 7.6% in mathematics, 9.6% in science and 11.1% in reading (OECD, 2016a). In Turkey, these percentages are as high as 51.4% for mathematics, 44.5% for science and 40% for reading (OECD, 2016a). The percentages of students who show proficiency at Level 2 and below in Turkey's PISA 2012, 2015 and 2018 tests in all learning domains are given in Table 1.

Table 1. Distribution of Students in PISA 2012, 2015 and 2018 Turkey by Basic and Below-Basic Proficiency Levels

Years	Reading Literacy		Mathematics Literacy		Science Literacy	
	Below Basic Proficiency (%)	Basic Proficiency (%)	Below Basic Proficiency (%)	Basic Proficiency (%)	Below Basic Proficiency (%)	Basic Proficiency (%)
2012	21.7	30.8	42.0	17.8	26.3	35.4
2015	40.0	32.6	51.3	25.3	44.4	31.3
2018	26.1	30.2	36.7	27.3	25.1	32.8

According to Table 1, the percentage of students performing at basic proficiency and below proficiency levels is over 50% for all learning domains and participation years. The percentage of students performing below the basic proficiency level is at least 20% of the students participating in PISA. It is worth bearing in mind that these high values in the case of Turkey are also related to educational, economic and social problems. The question "Why is the percentage of students at the basic proficiency level and below so high in Turkey?" needs to be asked. Turkey's socio-economic development, cultural enrichment, and individual and social welfare are closely related to answering this question and finding a solution to it. According to Kutlu (2004), it is very difficult for individuals to develop the skills of giving meaning to social events, associating events, questioning and producing solutions without developing their reading comprehension skills first.

Reading comprehension is a basic life skill that individuals need throughout their lives and that they use effectively in almost every field. Eastman (2010) defines reading comprehension as an individual's making sense of a message to be interpreted by using his/her prior knowledge and experiences. To be able to learn various pieces of information, to use this information, for example, in shopping, travel, family decisions, friendship relations, understanding different cultures, and continuing this learning at higher levels in many similar situations requires having good reading and reading comprehension skills. Considering the positive effects of reading comprehension skills at the individual, social and academic level, it is inevitable that students and societies with low success in reading comprehension will suffer some terrible consequences for both their present and future lives.

In light of the research findings discussed above, the current study is considered important since it aims to reveal the characteristics of the families of low performing students in the national literature. Studies in the literature on PISA seem to focus on factors that affect or predict students' success (Boyd, 2004; Brookhart, 2001; Deng & Gopinathan, 2016; Grehan, Flanagan, & Malgady, 2011; McKenzie & Schweitzer, 2010; Powell & Arriola, 2010; White, 1982). Determining the factors behind success, specifying factors pointing to failure and planning studies based on precautions will enable some important steps to be taken to improve the performance of underachieving students. Findings may enable these students to show higher performance by taking the necessary measures. The focus of the study is to determine the family characteristics of students which can make a distinction between low and basic performers at reading domain.

Research Questions

The aim of this study is to describe the family characteristics of students who have reading success at the basic level and below the basic level in PISA Turkey 2012, 2015 and 2018, to observe the year-by-year changes and to determine the variables that classify the students at the basic proficiency level or below.

For this purpose, the questions to be answered in the research are as follows:

1. Regarding the students who performed at the basic proficiency level and below the basic proficiency level in PISA Turkey 2012, 2015 and 2018, how did their;

   a- maternal and paternal education status,

   b- sociocultural and economic status, and

   c- the resources at home change?

2. Which of the student and family variables predict(s) the basic (or below) proficiency level of the students participating in the PISA Turkey 2012, 2015 and 2018?
3. How did the variables that predict students to be at or below the basic proficiency level change over the years of implementation?

METHOD

Research Design

This study was designed as a correlational survey. Survey studies aim to reveal the relationship between two or more quantitative variables (Fraenkel & Wallen, 2006). This study analyzes some variables related to students and their families and its predictive power for the level of reading proficiency. This research is also a secondary data analysis study on PISA Turkey 2012, 2015 and 2018 data. The purpose of secondary data analysis studies is to analyze the already collected and analyzed data with better techniques or to use the relevant data to answer different questions (Glass, 1976). This study aims to answer different questions based on the data collected

for PISA Turkey 2012, 2015 and 2018.Method section may include research design, the study group or participants of the study, data collection tools, data analysis.

Study Group

Group of this study composed of PISA samples. The study group of the research consists of students at the first and second proficiency levels in the Turkey test samples of PISA 2012, 2015 and 2018. The number of students in the population and working group of PISA Turkey 2015, 2015 and 2018 are given in Table 2.

Table 2. Distribution of Students in PISA Turkey 2012, 2015 and 2018

Population and Study Group	Gender	Implementation Years					
		2012		2015		2018	
		f	%	f	%	f	%
Population	Female	2370	48.9	2938	49.8	3396	49.3
	Male	2478	51.1	2957	50.2	3494	50.7
	Total	4848	100	5895	100	6890	100
Below Basic Proficiency Level (Level 1)	Female	291	28	1035	43	696	38
	Male	748	72	1391	57	1128	62
	Total	1039	100	2426	100	1824	100
Basic Proficiency Level (Level 2)	Female	699	46	1002	51	1036	50
	Male	795	53	962	49	1039	50
	Total	1494	100	1964	100	2075	100

Table 2 gives information about the gender distribution of students who participated in the PISA implementation in different years. When the table is examined, the percentage of female students are quite close for all years. On the other hand, the percentage of male students in the group of low performers was higher in all years.

Data Collection

Data for each implementation year was downloaded from OECD official web site. Student questionnaires were examined. Information about the variables were provided from student questionnaires.

Data Analysis

As suggested by OECD (2009), first, student sampling weights were normalized. Later, all analysis were performed on all plausible values separately, for all implementation years and the averages of the results were reported. Descriptive statistics were used to summarize the first research question. The findings are presented in numbers, percentages and through graphs. Logistic regression was used to answer the second and third research questions. All assumptions of the analysis were checked and met (Cokluk, Şekercioğlu, & Büyüköztürk, 2012).

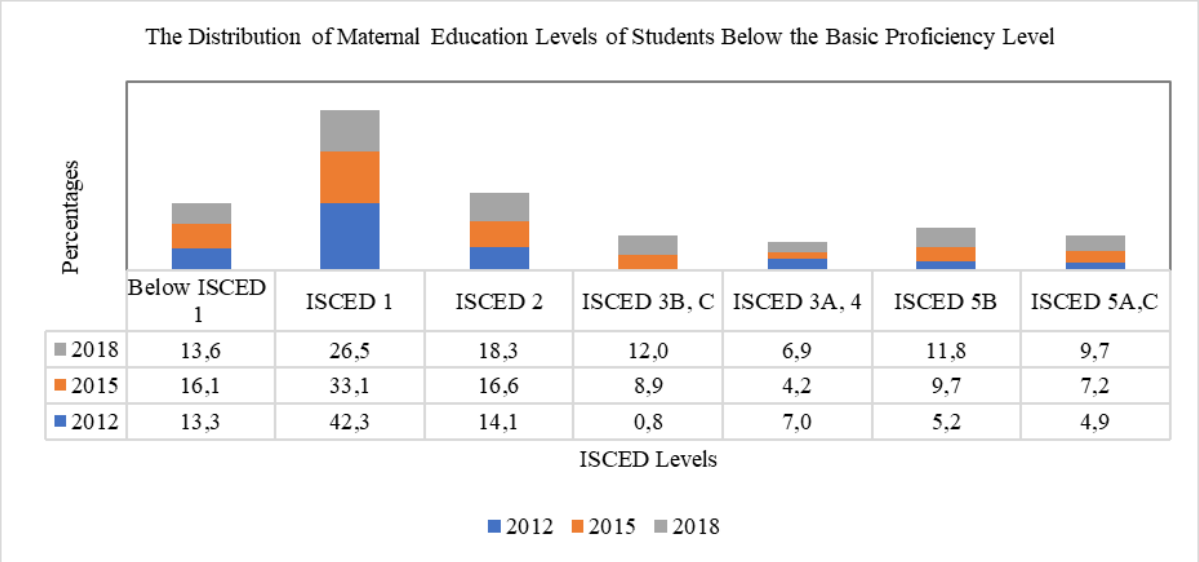
The predictive variables in the regression model are as follows: student's gender, pre-school education status, having a desk where the student can study, a room, a quiet place of his/her own, computer, educational software, internet connection, literature, poetry, art, test book, technical book, number of books, socioeconomic and cultural indexes of the family, mother and father education level and grade repetition. It was considered important to choose the same predictor variables for all implementation years to be able to make a comparison. In PISA 2018, attending pre-school education had a lot of missing data in the Turkish version. Therefore, it was excluded from the analysis for PISA 2018. The predicted variable is students' being at or below the basic proficiency at reading comprehension.

Research Ethics

This data used and analysed in this study was downloaded from the official web site of OECD. Therefore, it requires no ethical committee permission. However, no research ethics were violated.

FINDINGS

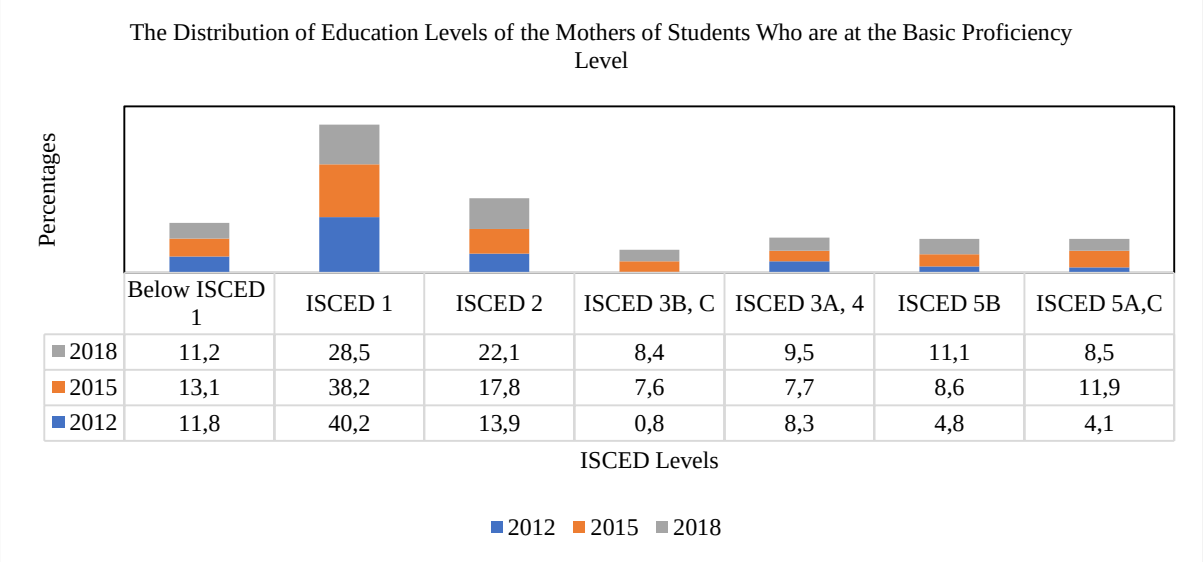
The first question answered as part of the research concerns the extent of change in the family characteristics (education level of the parents, economic and sociocultural indexes and resources at home) of the students who are at or below the basic proficiency level in PISA Turkey 2012, 2015 and 2018. OECD collects the data about the parental education levels according to an international classification called The International Standard Classification of Education (ISCED). Education levels corresponding to ISCED levels can be found from OECD, 2015 if interested. Figure 1 shows the distribution of education levels of the mothers of students who are below the basic proficiency level.



	Below ISCED 1	ISCED 1	ISCED 2	ISCED 3B, C	ISCED 3A, 4	ISCED 5B	ISCED 5A,C
2018	13,6	26,5	18,3	12,0	6,9	11,8	9,7
2015	16,1	33,1	16,6	8,9	4,2	9,7	7,2
2012	13,3	42,3	14,1	0,8	7,0	5,2	4,9

Figure 1. *Maternal Education Levels of Low Performer Students*

The first striking finding revealed by Figure 1 is that mothers graduating from primary school (Below ISCED 1) constitute approximately 15% of the group for all years. The mothers of 15 students out of every 100 students below the basic proficiency level are not even primary school graduates. For this level, the highest percentage of mothers hold either primary school (ISCED 1) or secondary school (ISCED 2) degrees. Mothers who are primary and secondary school graduates for all implementation years constitute half of the group. Figure 2 shows the distribution of education levels of mothers of students at the basic proficiency level.

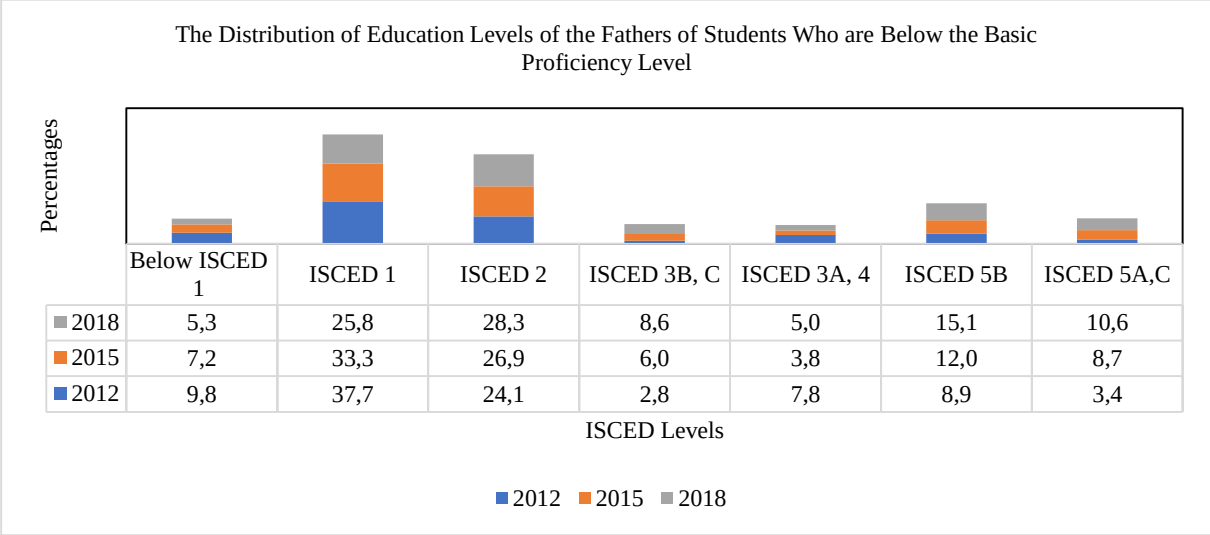


	Below ISCED 1	ISCED 1	ISCED 2	ISCED 3B, C	ISCED 3A, 4	ISCED 5B	ISCED 5A,C
2018	11,2	28,5	22,1	8,4	9,5	11,1	8,5
2015	13,1	38,2	17,8	7,6	7,7	8,6	11,9
2012	11,8	40,2	13,9	0,8	8,3	4,8	4,1

Figure 2. *Maternal Education Levels of Basic Performer Students*

According to Figure 2, 11 out of every 100 students at the basic proficiency level in all years of implementation have either had no primary education or have not completed primary school (ISCED Below 1). The percentage of mothers with primary and secondary school degree is 54.1% for 2012, 56% for 2015, and 50.6% for 2018. When the education level of mothers with less than secondary education is considered as a whole, it can be seen to be above 60% for all three years of implementation.

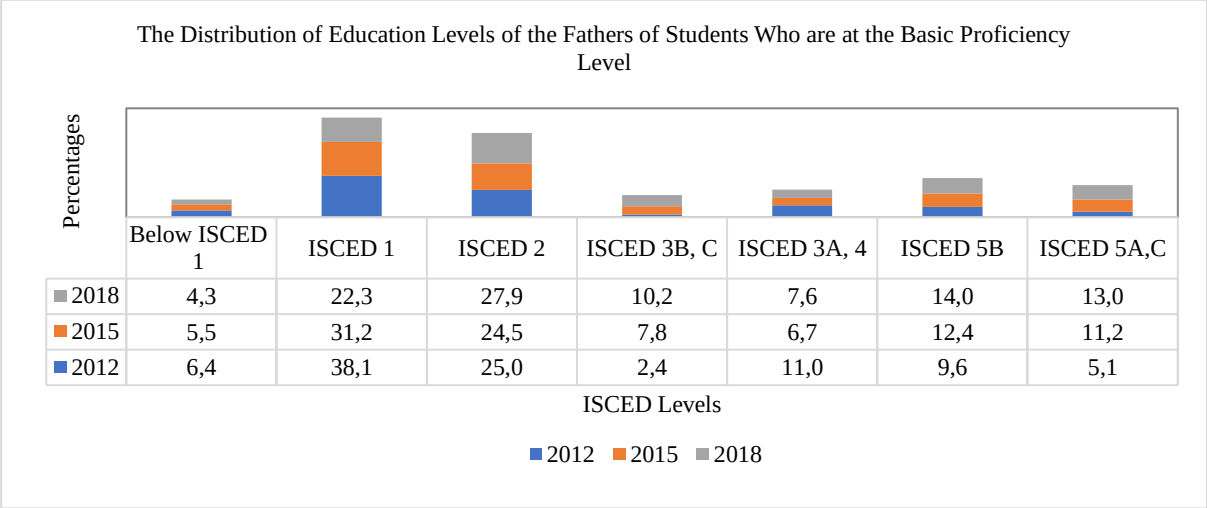
When Figure 1 and Figure 2 are examined together, the distribution of mothers of students who are at or below basic proficiency level by education levels can be observed to be similar, although with varying percentages. In addition, maternal education level increases for both groups from 2012 to 2018, without any significant change in students' proficiency levels. Figure 3 shows the education level distribution of fathers of students who are below the basic proficiency level.



	Below ISCED 1	ISCED 1	ISCED 2	ISCED 3B, C	ISCED 3A, 4	ISCED 5B	ISCED 5A,C
2018	5,3	25,8	28,3	8,6	5,0	15,1	10,6
2015	7,2	33,3	26,9	6,0	3,8	12,0	8,7
2012	9,8	37,7	24,1	2,8	7,8	8,9	3,4

Figure 3. *Paternal Education Levels of Low Performer Students*

Figure 3 shows that the education levels of fathers with less than secondary education ((ISCED 2) is observed to be around 60% for each of the three years of implementation. Its trend showed a decrease; yet, the percentages are high. Figure 4 shows the education level distribution of fathers of students at the basic proficiency level.

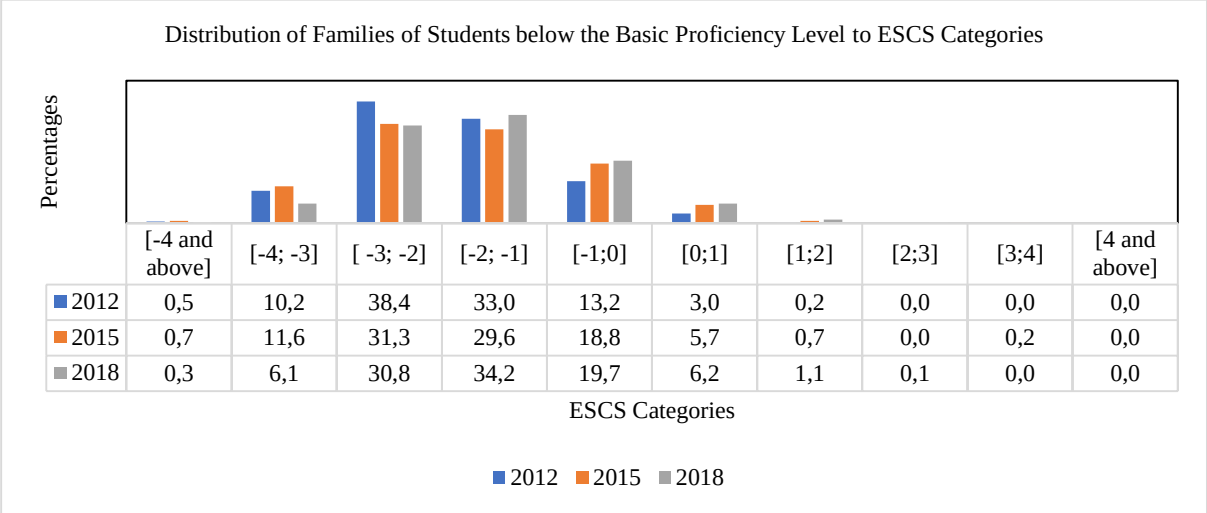


	Below ISCED 1	ISCED 1	ISCED 2	ISCED 3B, C	ISCED 3A, 4	ISCED 5B	ISCED 5A,C
2018	4,3	22,3	27,9	10,2	7,6	14,0	13,0
2015	5,5	31,2	24,5	7,8	6,7	12,4	11,2
2012	6,4	38,1	25,0	2,4	11,0	9,6	5,1

Figure 4. *Paternal Education Levels of Basic Performer Students*

As can be seen in Figure 4, about 5% of every 100 students at the basic proficiency level have fathers without a primary school degree (Below ISCED 1). The primary (ISCED 1) or secondary school (ISCED 2) graduates constitute 63.1% of the group in the 2012, 55.7% in 2015, and 50.2% in 2018. Regarding all three years of implementation, approximately 60% of the fathers have less than secondary education. When Figures 3 and 4 are considered together, the distribution of father's education level presents similar distributions. The education level of fathers increases from 2012 to 2018 for both groups.

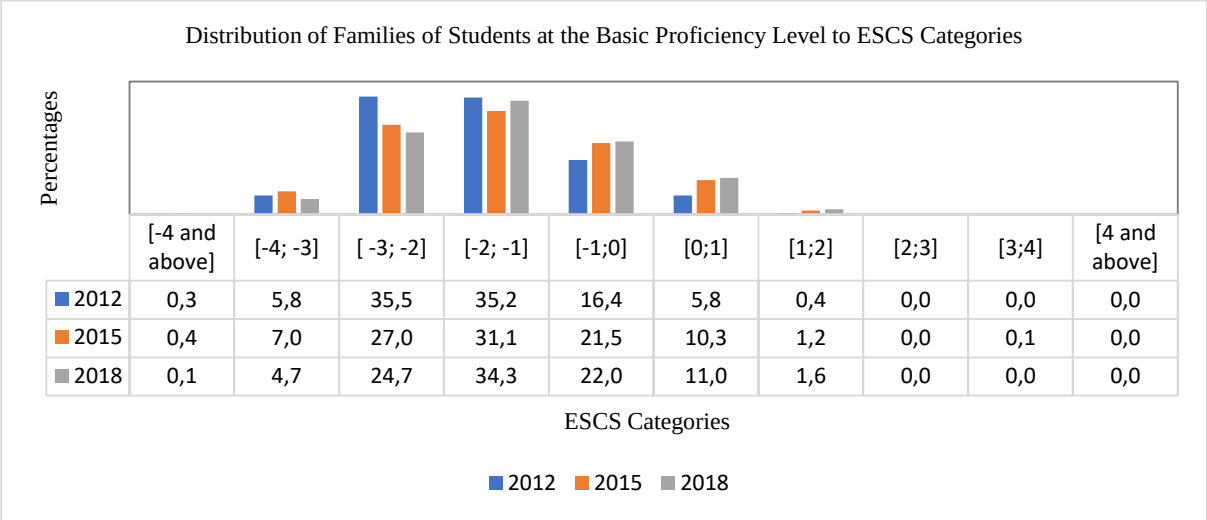
The Economic and Socio-Cultural Status (ESCS) distribution of the student families who participated in the PISA 2012, 2015 and 2018 at or below the basic proficiency level is given in Figure 5. ESCS is defined as an index in PISA and is a continuous variable. For the purposes of the current research, it was converted into an artificial discrete variable. Figure 5 shows the distribution of the economic and socio-cultural status of the families of students below the basic proficiency level by year.



	[-4 and above]	[-4; -3]	[-3; -2]	[-2; -1]	[-1;0]	[0;1]	[1;2]	[2;3]	[3;4]	[4 and above]
2012	0,5	10,2	38,4	33,0	13,2	3,0	0,2	0,0	0,0	0,0
2015	0,7	11,6	31,3	29,6	18,8	5,7	0,7	0,0	0,2	0,0
2018	0,3	6,1	30,8	34,2	19,7	6,2	1,1	0,1	0,0	0,0

Figure 5. *ESCS Categories Distribution of Families of Low Performer Students*

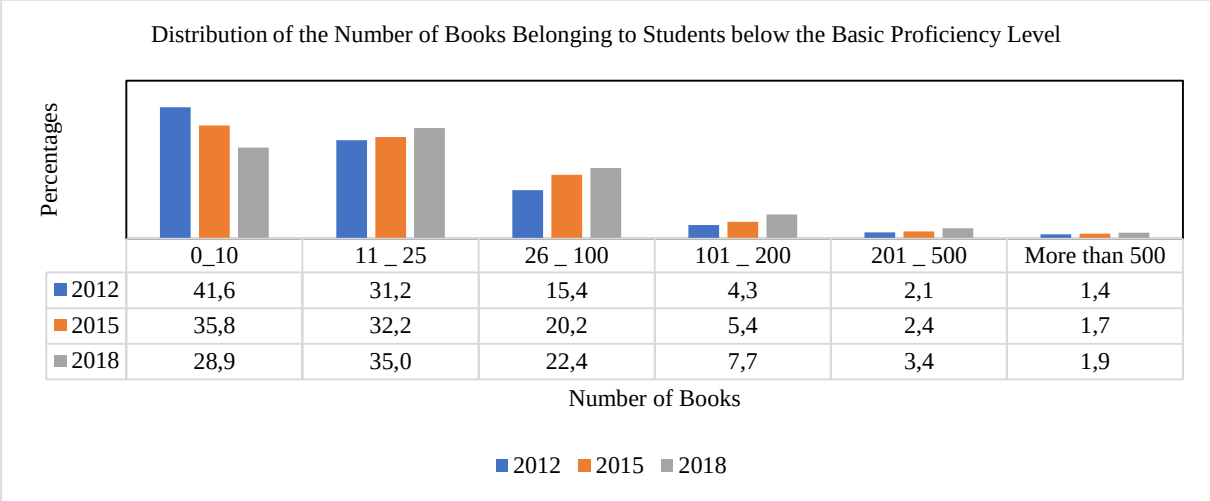
When Figure 5 is examined, it is seen that the students who are below the basic proficiency level for all the implementation years cumulate around the ESCS groups of [-3; -2], [-2; -1], and [-1; -0]. What is remarkable here is the group range in which the students below the basic proficiency level are distributed. In other words, as the years progress, students from high socioeconomic and sociocultural status are added to the low achievement group. Figure 6 shows the distribution of the economic and socio-cultural status of the families of students at the basic proficiency level by year.



	[-4 and above]	[-4; -3]	[-3; -2]	[-2; -1]	[-1;0]	[0;1]	[1;2]	[2;3]	[3;4]	[4 and above]
2012	0,3	5,8	35,5	35,2	16,4	5,8	0,4	0,0	0,0	0,0
2015	0,4	7,0	27,0	31,1	21,5	10,3	1,2	0,0	0,1	0,0
2018	0,1	4,7	24,7	34,3	22,0	11,0	1,6	0,0	0,0	0,0

Figure 6. *ESCS Categories Distribution of Families of Basic Performer Students*

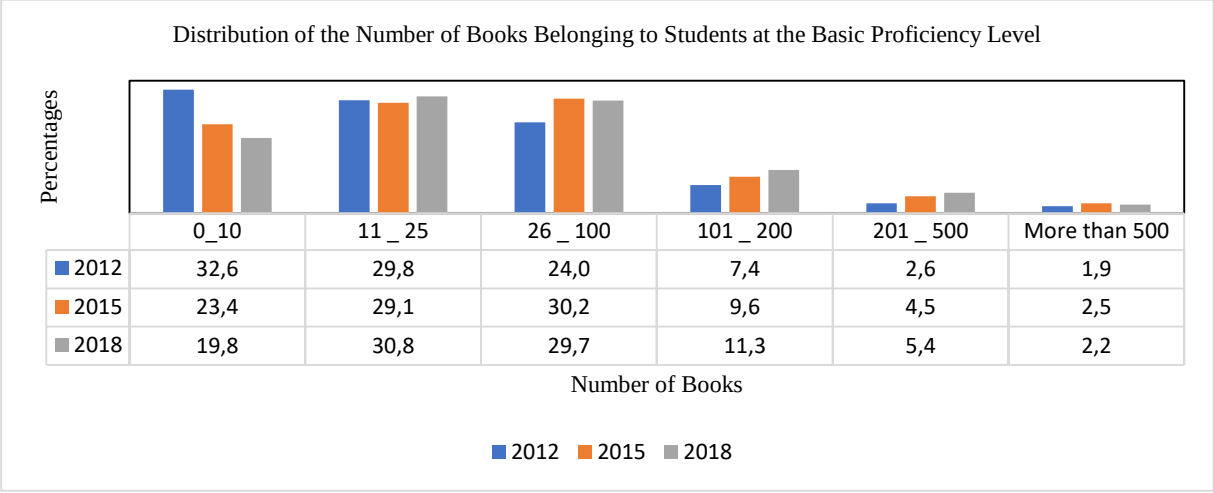
As shown in Figure 6, the families of students at the basic proficiency level pile up in the ESCS groups [-3; -2], [-2; -1], and [-1; -0]. A close look into the distribution reveals that the ESCS distributions of the families of the students at the basic proficiency level do not differ greatly by year. When Figures 5 and 6 are considered together, the distribution of the ESCS status of the students at the basic proficiency level and below is found to be quite similar. In each implementation year, student performance declines despite socioeconomic and cultural characteristics. The distribution of the number of books owned by the students below the basic proficiency level in PISA 2012, 2015 and 2018 is given in Figure 7.



	0_10	11 _ 25	26 _ 100	101 _ 200	201 _ 500	More than 500
2012	41,6	31,2	15,4	4,3	2,1	1,4
2015	35,8	32,2	20,2	5,4	2,4	1,7
2018	28,9	35,0	22,4	7,7	3,4	1,9

Figure 7. *Distribution of the Number of Books for Low Performer Students*

As shown in Figure 7, the first striking finding is that the number of books belonging to this group pf students is very low. In 2012, students who had 25 or fewer books accounted for 72.8% of the whole group; while this figure was 68% in 2015, and 63.9% in 2018. While students with more than 100 books accounted for 7.8% of the whole group for 2012, 9.5% for 2015, and 13% for 2018. However, there is a noteworthy increase in the number of books owned for each interval from 2012 to 2018. The distribution of the number of books owned by the students at the basic proficiency level in PISA 2012, 2015 and 2018 is given in Figure 8.



	0_10	11 _ 25	26 _ 100	101 _ 200	201 _ 500	More than 500
2012	32,6	29,8	24,0	7,4	2,6	1,9
2015	23,4	29,1	30,2	9,6	4,5	2,5
2018	19,8	30,8	29,7	11,3	5,4	2,2

Figure 8. *Distribution of the Number of Books for Basic Performer Students*

As shown in Figure 8, the majority of the students have fewer than 100 books. In 2012, students who had 100 or fewer books accounted for 86.4% of the group; whereas this figure was 82.7% in 2015, and 80.7% in 2018. The students with 101 or more books accounted for 11.9% in 2012, 16.6% in 2015, and 18.9% in 2018. When Figures 7 and 8 are considered together, it can be said that the concentration in the distribution of books is similar for students at both proficiency levels, but more of the students at the basic proficiency level have 100 books or fewer. For both proficiency levels, an increase is observed in the percentage of students who own a book. Table 3 shows the change over time in the resources available at home to the students who are at the basic proficiency level (Level 2) and below (Level 1) in PISA Turkey 2012, 2015 and 2018.

Table 3. Resources Available at Home to Students at or below Basic Proficiency Level

Resources	2012		2015		2018	
	% Yes (Level 1)	%- Yes (Level 2)	% Yes (Level 1)	%- Yes (Level 2)	% Yes (Level 1)	%- Yes (Level 2)
Desk to study	69.5	81.4	75.7	85.8	80.9	88.3
Room of her/his own	54.3	64	61.3	71.6	65.6	72.9
Place to study	69	78.7	75.3	83.4	80.2	86.1
Computer	48.4	61.9	53	69	50.5	63
Educational Software	32	27.2	37.9	38.5	42.6	41.3
Internet Connection	40.7	50.3	49	61.9	60.3	73.1
Literature books	33.8	51.3	37.8	53.8	53.3	70.1
Poetry books	49.1	53.2	49.8	54.2	52.6	56
Art works	20.9	33	24.9	30	30.9	31.4
Textbooks	62.7	76.9	70.7	83.1	75.9	86.1
Technical books	29.7	34.6	35.4	40.8	36.6	36.8
Music and architecture books	-		5.7	40	38.8	40.7

As shown in Table 3, it is clear that the percentage of students having their own room, computer and study desk for both proficiency levels has increased over the years. According to the table, the percentage of students owning literature, poetry, technical, art, music and architectural books is quite low. In addition, the low number of works of art paintings, photographs, sculptures, and such is also striking. Although the percentage of students at the basic proficiency level having these resources is higher than the students below the basic proficiency level, the percentages for both groups are quite low. The distribution in Tables 7 and 8 confirms this conclusion. Another remarkable finding is related to software. Although most of the students have a computer and internet connection at home, very few have educational software.

The second question of the research is related to determining which of the student and family variables predict the proficiency level of the students participating in the PISA Turkey 2012, 2015 and 2018. The logistic regression model explained in the data analysis is tested. -2LL values for the null model, in which there are no predictive variables, is 3258.82 for PISA 2012, 5179.51 for PISA 2015 and 4718.86 for PISA 2018. This log likelihood value is expected to decrease as the independent variables are added to the model. According to the first classification results, the classification accuracy is 61.18%; 52.61% and 55% respectively. Chi square values of models with no predictor variables for all implementation years are found to be statistically significant [$\chi 2(33) = 340.85$, $p=0.00$ for PISA 2012; $\chi 2(32) = 474.10$, $p=0.00$ for PISA 2015; $\chi 2(32) = 434.20$, $p=0.00$ for PISA 2018]. This indicates that the coefficients of the predictor variables that are not yet included in the model are significantly different from zero (Field, 2009). When the Omnibus test results related to model coefficients is examined, they are found to be all statistically significant for all implementation years. This statistic is an indication that there is a significant difference between the null model and the test model.

For the test model, the -2 log likelihood values are is 2446.56 for PISA 2012, 4655.78 for PISA 2015, and 4236.68 for 2018. All -2 log likelihood values are smaller than the null model, indicating that predictive variables function well. As regards the Nagelkerke R2 value, the test model accounts for 18% of the variance in the predicted variable for 2012 and 17% for 2015 and 2018. Based on the output of the Hosmer and Lemeshow test, the model has acceptable fit for all implementation years [$\chi^2(8) = 9.61$, $p=0.42$ for 2012; $\chi^2(8) = 8.12$, $p=0.45$ for 2015; $\chi^2_{(8)} = 6.42$, $p=0.60$ for PISA 2018]. Lastly, the classification accuracy of the test model shows an increase compared to the null model for all years. The percentage of correct classification was 68.46% for PISA 2012; 64.59% for PISA 2015 and 65% for PISA 2018. Table 4 shows the parameter estimations of the predictor variables in the model for PISA 2012.

Table 4. Estimations of Predictive Variables in PISA 2012

Year	Variables	β	S. E.	Wald	df	p	Odds Ratio (e-β)
2012	*Gender (1)*	*0.75*	*0.11*	*50.16*	*1*	*0.000*	*2.13*
	Preschool			4.76	2	0.124	
	Preschool (1)	0.30	0.15	4.33	1	0.071	1.35
	Preschool (2)	0.16	0.22	0.73	1	0.507	1.18
	Desk to study (1)	*0.31*	*0.14*	*5.39*	*1*	*0.049*	*1.38*
	Own room (1)	-0.02	0.12	0.45	1	0.631	0.98
	Place to study (1)	0.15	0.13	1.48	1	0.288	1.16
	Computer (1)	0.30	0.15	4.75	1	0.126	1.37
	Software (1)	*-0.32*	*0.12*	*8.03*	*1*	*0.025*	*0.73*
	Internet (1)	0.00	0.15	0.35	1	0.646	1.01
	Literature (1)	*0.50*	*0.11*	*21.14*	*1*	*0.004*	*1.67*
	Poetry (1)	*-0.29*	*0.11*	*6.96*	*1*	*0.034*	*0.75*
	Art (1)	-0.01	0.13	0.47	1	0.652	1.00
	Textbooks (1)	*0.32*	*0.12*	*7.44*	*1*	*0.022*	*1.39*
	Technical books (1)	-0.08	0.12	0.58	1	0.515	0.92
	Number of books			8.79	5	0.177	
	Number of books (1)	0.00	0.12	0.26	1	0.643	1.00
	Number of books (2)	*0.34*	*0.15*	*5.38*	*1*	*0.047*	*1.41*
	Number of books (3)	0.35	0.23	2.37	1	0.169	1.43
	Number of books (4)	0.06	0.33	0.46	1	0.624	1.09
	Number of books (5)	0.17	0.40	0.17	1	0.678	1.18
	ESCS	0.06	0.12	0.33	1	0.645	1.06
	Education of father			5.78	6	0.512	
	Education of father (1)	0.33	0.21	2.92	1	0.145	1.41
	Education of father (2)	0.27	0.23	1.78	1	0.329	1.32
	Education of father (3)	0.28	0.40	0.56	1	0.494	1.33
	Education of father (4)	0.33	0.29	1.50	1	0.314	1.40
	Education of father (5)	0.25	0.31	0.80	1	0.445	1.29
	Education of father (6)	0.53	0.40	2.01	1	0.243	1.73
	Education of mother			6.69	6	0.411	
	Education of mother (1)	-0.05	0.15	0.27	1	0.669	0.95
	Education of mother (2	-0.13	0.18	0.82	1	0.484	0.88
	Education of mother (3)	-0.98	0.55	3.51	1	0.152	0.41
	Education of mother (4)	0.04	0.28	0.64	1	0.496	1.06
	Education of mother (5)	-0.06	0.30	0.21	1	0.724	0.95
	Education of mother (6)	-0.47	0.38	1.51	1	0.227	0.63
	Grade repetition (1)	*-0.97*	*0.12*	*71.38*	*1*	*0.000*	*0.38*
	Constant	-0.55	0.45	1.53	1	0.245	0.58

First of all, the Wald statistics were analyzed to determine the significance of the variables. Accordingly, for PISA 2012, the variables that statistically significantly predicted whether the students were below or at the basic proficiency level were found to be the gender of the student, whether there was a study desk at home, whether there was an educational software at home, whether the student had literature, textbooks and poetry books, the number of books at home, and whether or not the student repeated a grade. When the beta coefficients of these variables are examined, the presence of positive and negative values is striking. The positive coefficient increases the predicted probability (being at the basic proficiency level), while the negative coefficients decrease it. Odds ratios of 1 and above increase the probability of the phenomenon occurring, while a ratio below 1 decrease. For example, looking at Table 6, the Wald statistic of the gender variable is observed to be significant ($p<0.05$). As such, the gender variable significantly predicts being at or below the basic proficiency level. Looking at the beta coefficient, it can be seen that the coefficient is positive (0.75). Therefore, being female increases the probability of being at the basic proficiency level. Finally, when we look at the odds ratio of the gender variable, we observe that the ratio is 2.13. Thus, being female increases the probability of being at the basic proficiency level 2.13 times. When making interpretations based on the odds ratios for other variables, having a study desk at home increases students' probability of being at the basic proficiency level 1.38 times; having literature books increases it 1.67 times, having textbooks increases 1.39 times, and having 26-100 books at home increases this probability 1.41 times. On the other hand, having educational software at home reduces the likelihood of being at the basic proficiency level 0.73 times; having poetry books reduces it 0.75 times, and repeating a grade results reduces 0.38 times. Table 5 shows the parameter estimations of the predictive variables in the model for PISA 2015.

Table 5. Parameter Estimations of Predictive Variables in PISA 2015

Year	Variables	β	S. E.	Wald	df	p	Odds Ratio (e-β)
2015	*Gender (1)*	*0.22*	*0.07*	*10.24*	*1*	*0.025*	*1.25*
	Desk to study (1)	0.04	0.11	0.71	1	0.566	1.05
	Own Room (1)	0.03	0.09	0.98	1	0.537	1.03
	Place to study (1)	0.14	0.10	2.17	1	0.224	1.15
	Computer (1)	*0.25*	*0.10*	*6.61*	*1*	*0.044*	*1.29*
	Software (1)	*-0.34*	*0.08*	*19.04*	*1*	*0.001*	*0.71*
	Internet (1)	*0.28*	*0.10*	*8.86*	*1*	*0.021*	*1.32*
	Literature (1)	*0.36*	*0.08*	*20.56*	*1*	*0.007*	*1.44*
	Poetry (1)	*-0.21*	*0.08*	*7.51*	*1*	*0.040*	*0.81*
	Art pieces (1)	-0.11	0.09	2.81	1	0.264	0.90
	Textbooks (1)	*0.32*	*0.10*	*11.81*	*1*	*0.013*	*1.39*
	Technical books (1)	-0.13	0.08	3.10	1	0.209	0.88
	Art, music and architecture books (1)	-0.10	0.08	1.82	1	0.306	0.91
	Number of books			35.07	5	0.000	
	Number of books (1)	0.13	0.09	3.41	1	0.198	1.15
	Number of books (2)	*0.47*	*0.10*	*21.04*	*1*	*0.003*	*1.61*
	Number of books (3)	*0.62*	*0.16*	*16.78*	*1*	*0.001*	*1.88*
	Number of books (4)	*0.62*	*0.21*	*8.88*	*1*	*0.019*	*1.88*
	Number of books (5)	0.56	0.27	4.80	1	0.130	1.79
	Education of mother			34.34	6	0.000	
	Education of mother (1)	0.08	0.11	0.99	1	0.449	1.08
	Education of mother (2)	-0.19	0.14	2.15	1	0.248	0.83
	Education of mother (3)	-0.38	0.17	5.26	1	0.058	0.68
	Education of mother (4)	0.15	0.19	1.26	1	0.512	1.18
	Education of mother (5)	*-0.58*	*0.18*	*11.05*	*1*	*0.005*	*0.57*
	Education of mother (6)	*-0.56*	*0.20*	*8.35*	*1*	*0.016*	*0.57*
	Education of father			10.85	6	0.249	
	Education of father (1)	0.01	0.16	0.26	1	0.662	1.01
	Education of father (2)	-0.15	0.17	1.20	1	0.459	0.87
	Education of father (3)	0.16	0.22	0.79	1	0.465	1.18
	Education of father (4)	0.18	0.23	1.10	1	0.510	1.21
	Education of father (5)	-0.03	0.21	0.24	1	0.698	0.98
	Education of father (6)	0.06	0.24	0.41	1	0.628	1.08
	Grade repetition (1)	*-1.31*	*0.12*	*118.78*	*1*	*0.000*	*0.27*
	ESCS	*0.21*	*0.08*	*8.93*	*1*	*0.047*	*1.24*
	Constant	-0.36	0.32	1.84	1	0.302	0.72

As shown in Table 5, the variables that significantly predict students' being at or below the basic proficiency level are gender, having a computer, software, internet connection, literature and poetry books and textbooks, the number of books, mother's education level, student's grade level repetition, and socioeconomic and cultural status of the family. Accordingly, provided that all other variables are constant, the probability of the student being at the basic proficiency level is increased by being a girl 1.25 times, by owning a computer 1.29 times, by having internet connection 1.32 times, by having literature books 1.44 times, and by having reference books to help lessons 1.39 times. Further, having 26-100 books increases this probability 1.61 times, having 101-200 books increases it 1.88 times, and having 201-500 books increases it 1.88 times. When all the variables are held constant, a one-unit increase in students' ESCS status increases the probability of students to be at the basic proficiency level 1.24 times. On the other hand, having educational software at home leads to 0.71 times more likelihood in being at the basic proficiency level; having poetry books at home causes 0.81 times decrease; the mother's having an associate degree increases it 0.57 times, while her having a bachelor's and master's degree reduces it 0.57 times. If the student repeats a grade, the probability of being at the basic proficiency level decreases 0.27 times. Table 6 shows the parameter estimations of the predictive variables in the model for PISA 2018.

Table 6. Parameter Estimations of Predictive Variables in PISA 2018

Year	Variables	β	S. E.	Wald	df	p	Odds Ratio (e-β)
2018	*Gender (1)*	*0.30*	*0.08*	*16.15*	*1*	*0.001*	*1.36*
	Desk to study (1)	0.16	0.12	2.08	1	0.265	1.18
	Own Room (1)	-0.06	0.09	0.59	1	0.538	0.94
	Place to study (1)	0.14	0.11	1.72	1	0.239	1.15
	Computer (1)	0.22	0.09	6.04	1	0.083	1.25
	Software (1)	*-0.39*	*0.08*	*23.70*	*1*	*0.000*	*0.68*
	Internet (1)	*0.25*	*0.10*	*6.66*	*1*	*0.027*	*1.28*
	Literature (1)	*0.46*	*0.09*	*29.28*	*1*	*0.000*	*1.59*
	Poetry (1)	-0.22	0.09	7.44	1	0.062	0.80
	Art pieces (1)	-0.13	0.09	2.02	1	0.183	0.88
	Textbooks (1)	*0.27*	*0.11*	*6.22*	*1*	*0.025*	*1.31*
	Technical books (1)	*-0.24*	*0.09*	*8.44*	*1*	*0.010*	*0.78*
	Art, music and architecture books (1)	*-0.22*	*0.09*	*7.41*	*1*	*0.025*	*0.80*
	Number of books			43.26	5	0.000	
	Number of books (1)	0.08	0.10	1.10	1	0.466	1.08
	Number of books (2)	*0.53*	*0.11*	*22.08*	*1*	*0.000*	*1.71*
	Number of books (3)	*0.63*	*0.16*	*16.82*	*1*	*0.000*	*1.89*
	Number of books (4)	*0.84*	*0.21*	*15.60*	*1*	*0.002*	*2.33*
	Number of books (5)	0.33	0.27	1.97	1	0.300	1.41
	Education of mother			40.07	6	0.000	
	Education of mother (1)	0.06	0.13	0.43	1	0.635	1.06
	Education of mother (2)	0.00	0.14	0.23	1	0.677	1.00
	Education of mother (3)	*-0.63*	*0.17*	*13.57*	*1*	*0.002*	*0.54*
	Education of mother (4)	0.06	0.19	0.40	1	0.713	1.07
	Education of mother (5)	-0.36	0.18	4.25	1	0.063	0.70
	Education of mother (6)	*-0.65*	*0.20*	*10.61*	*1*	*0.003*	*0.53*
	Education of father			7.42	6	0.338	
	Education of father (1)	-0.04	0.19	0.32	1	0.629	0.96
	Education of father (2)	-0.06	0.19	0.34	1	0.633	0.95
	Education of father (3)	0.04	0.23	0.38	1	0.599	1.05
	Education of father (4)	0.05	0.24	0.65	1	0.558	1.07
	Education of father (5)	-0.27	0.23	1.83	1	0.314	0.77
	Education of father (6)	-0.04	0.26	0.44	1	0.633	0.98
	Grade repetition (1)	*-1.14*	*0.13*	*83.59*	*1*	*0.000*	*0.32*
	ESCS	*0.27*	*0.08*	*12.33*	*1*	*0.002*	*1.31*
	Constant	0.01	0.36	0.32	1	0.688	1.03

As shown in Table 6, the variables that significantly predict a student's being at or below the basic proficiency level are gender, software, and internet connection at home, literature books, textbooks, books on technical and art and architecture, number of books, mother's education level, whether the student has repeated a grade or not, and the socioeconomic cultural status of the family. The probability of being at the basic proficiency level is increased 1.36 times by being female; 1.28 times by having internet connection; 1.59 times by having literature books, and 1.31 times by having resources to help learning the subjects. Examining the odds ratios for the variable of the number of books, a significant predictor, it was determined that the probability of having 26-100 books increases the likelihood of being at the basic proficiency level 1.71 times; having 101-200 books increases this probability 1.89 times, and having 201-500 books increases it 2.33 times. Moreover, a 1-unit increase in students' ESCS status increases their probability of being at the basic proficiency level 1.31 times. On the other hand, having educational software at home decreases the likelihood of being at the basic proficiency level 0.68 times; having technical books 0.78 times; having books on art, music and architecture 0.80 times; and the mother's vocational high school graduation 0.54 times; whereas her having a bachelor's and graduate degree reduces it 0.53 times. Repeating a grade reduces the probability of a student to be at the basic proficiency level 0.32 times.

The third research question focuses on the change of the statistically significant predictors of students' performances over the implementation years. To answer this question, the results of logistic regression was studied. Here, it is observed that there are 8 significant predictors in the model for 2012 and 11 predictors for 2015 and 2018. Based on this finding, it was concluded that, over time, an increasing number of variables play a role in the students' being below or at the basic proficiency level.

DISCUSSION & CONCLUSION

This study aimed to reveal the family characteristics and the resources of the students whose reading comprehension performance is at or below the basic proficiency level in PISA Turkey 2012, 2015 and 2018, to identify the year-by-year changes, and to find out the significant predictors of the students' proficiency levels. To this end, the gender, educational software, literature books and textbooks, number of books and grade repetition variables are found to be common classifiers of students' performance levels over last three PISA implementations. However, various variables are concluded to be predictors for each of the last three PISA implementations. Namely, students' gender, having a desk to study and educational software as well as poetry books and textbooks, number of books students have at home and grade repetition are determinant of students' low and basic performance levels for PISA 2012. For PISA 2015, students' gender, having a computer, educational software, internet connection, literature and poetry books as well as textbooks, number of books, educational statues of mother, grade repetition and ESCS index are resulted to be classifiers of students' low and basic level performances. Finally, students' gender, having an educational software, internet connection as well as having literature books, textbooks, technical and art books, number of books, education statues of mother, grade repetition and ESCS index are turned out to be significant classifiers of students' low and basic performance levels for PISA 2018 Turkey.

The findings of the study show that the parents of both the basic proficiency level and below the basic proficiency level groups are mostly primary school graduates, and some of the parents did not complete their primary school education. The findings about the educational status of the parents of the students at or below the basic proficiency level are in line with the literature (Gooding, 2001; Li & Qui, 2018; Ngure & Odundo, 2017; Shoukat, Ilyas, Azam & Ch, 2013). According to Bourdieu (1986), higher level of education increases parental cultural capital, which is transferred to children. This idea is based on the view of Laosa (1982) that "education has a lifelong effect on the behavior of individuals". Accordingly, the type and level of education received by individuals determines how they will behave as parents. Shaping the interactions between the parent and the child, this also determines what kind of personality the child will have. In other words, the decision of whether the individual has the affective characteristics that he/she needs to be successful or not is made in the family. Another argument attempts to explain the direct correlation between the education level of the parents and the school success of their children by stating that highly educated parents have high expectations from their children; that is, highly educated parents hold high academic expectations from their children. Therefore, students with such parents work harder and show higher performance (Steinmayr, Dinger, & Spinath, 2010). Considering the findings obtained from these studies as a whole, one of the reasons why underachieving students cannot display the high-level cognitive competencies expected from them may be the low educational level of their parents. In the current study, the education of parents of the students who are both below and at the basic proficiency level is mostly concentrated at primary and secondary school levels. Furthermore, there is a parent group of about 10% who have almost no formal education, and it is noteworthy that the percentage of parents with a high school or lower degree is around 80%.

It was also observed that the ESCS index indicates a higher socioeconomic and cultural status for both groups over time, but no change was found in the student performances due to this change. As indicated by the findings, under-performing is not only a problem of economically and socio-culturally disadvantaged groups. The related literature shows that the economic and sociocultural level of the family plays a role in student success (Broer, Bai, & Fonseca, 2019; Dowson & McInerney, 1998; Sirin, 2005). Low ESCS status is indicative of low economic and sociocultural status. When Figures 5 and 6 are examined, for all the years, the families of the student performing at the basic level and below can be seen to concentrate below the range of [0; 1]. When the resources available to the students at their homes were examined, it was observed that the students at the basic proficiency level and the students below this level did not have much difference.

The findings of the current study on the gender variable, which significantly predicts being at the basic proficiency level for all implementation years, is supported by the research findings in the literature. Here, the reference group is male students and the predicted gender is female, which is similar to the studies in the literature. Kutlu, Yıldırım, Bilican, and Kumandaş (2009) found that gender is a significant classification variable in students' reading comprehension success. Their research showed that being a girl means 1.86 times higher success in reading comprehension. Analyzing the characteristics related to reading comprehension success with progressive linear modeling, Yıldırım (2012) revealed that being a girl has a positive effect on success. The

findings by Alumran and Punamaki (2008), Bursal, Buldur and Dede (2015), Kukulu, Korukcu, Ozdemir, Bezci and Calik (2013), and Yıldırım (2012) also indicate that female students are more successful than male students. Considering the higher student scores at the level of basic proficiency, it was concluded that findings of this study were parallel to those reported in the related research literature.

Another finding of the study is that the resources the students have at home increase the probability of their being at the basic proficiency level. Thus, having a study desk, computer, internet connection, literature-related books and textbooks, in addition to having a higher number of books and a higher level of socio-and cultural status increase the probability of students' being at the basic proficiency level. This finding falls in with the literature. Güvendir (2014) emphasizes that students' academic performances develop as the number of books they have increase in numbers. Akyüz (2014) mentions the importance of resources students have and number of books on 8 grade students' mathematical performance. According to the research findings by Aslan (2017), the increase in students' families socio-economic and cultural statues results in higher students' performance. Families with higher economical economic inputs can allocate more resources for their children's education.

Another finding of the study is that having an educational software at home increases the probability that the student will perform below the basic proficiency level, which contradicts the findings of the literature indicating that educational software helps increase in student achievement (Kingsley & Boone, 2008; Zengin, Furkan & Kutluca, 2012). A closer look into these studies reveals that they have examined educational software as an alternative to the traditional method. However, the software in the current study is the one used by students at home. There are several reasons why the use of software appears to drive the student to perform below the basic proficiency level: for one, the software may not have the capability of assisting cognitive growth in students, and the other reason could be that students may not be able to use educational software effectively, given the distractive effect of the internet and PCs. Another reason may be that the type of assignments and tasks that students can do using educational software are not given by the teachers. If teachers do not assign the appropriate tasks to be done through educational software, their students will not use their educational software even if they have it at home.

Another remarkable finding of the study is related to the education level of the mother. The probability of a student's performing below the basic proficiency level increases when s/he has a mother with a vocational high school degree, or a mother with an associate degree, or a mother with undergraduate/graduate education. This finding contradicts with the literature. According to the literature, as the education level of the parents increases, the academic success of the child also increases, in other words, the education level of the parents of the students with high academic success is usually higher (Brown & Iyengar, 2008; Davis-Kean, 2005; Ekinci, 2011; Hanushek, 2016; Kodippili, 2011; Schreiber, 2002). Families with higher education have higher expectations from their children and therefore, the children of these families are more successful at school (Lippman et al., 2008). Nelson (2009) did not find a relationship between maternal education level and academic achievement. Considering the Turkish education system, it is known that vocational and technical education institutions do not expect academic success. Another interesting finding of the study is that mothers' receiving undergraduate and graduate education reduces the probability of students being at the basic proficiency level, which may be related to Turkey's higher education policies. The rapidly increasing number of universities and the increase in distance and open education programs have enabled many individuals to obtain a university degree. In addition, both the increase in the number of non-thesis master's programs and the increase in the number of students admitted to these programs may have lowered the quality of education at the undergraduate and postgraduate level. Even though mothers have earned this type of diploma, they may not be able to pass the standards of this education on to their children because they may have not actually attained the qualifications required by this type of education. This issue is worth examining further through future studies. Another variable that increases the probability of performing below the basic proficiency level is class repetition. OECD (2016b) states that students who repeat a grade are most likely to not reach the basic proficiency level. The issue of grade repetition in Turkey is an issue that is kept on the agenda of the Turkish Ministry of National Education (MoNE). MoNE usually transfers the students who need to repeat a grade to a higher grade conditionally or makes it dependent on the parents' decision. Edis and Yılmaz (2020) surveyed the opinions of 50 classroom teachers about grade repetition. 84% of the teachers stated that not repeating the grade would lead students to have difficulties in their upper grades, 76% stated that students would be negatively affected by their future examinations, 100% stated that the grade repetition decision should not be left to the parents, and 80% reported that students' study behaviors would be affected negatively. Bedel (2013) found that grade repetition increases the level of state anxiety in students. Grade repetition draws attention as a factor that reduces student achievement.

When the total correct classification percentage of the tested model is analyzed on a yearly basis, it is seen that the highest correct classification percentage was in 2012 (68.46%), while the other implementation years were lower (around 65%). Yet, the number of significant variable increase in numbers over years. This result may stand for that the impact of family and students' characteristics loosen its power on students' performance. The first suggestion can be made here is that other variables (affective variables, school variables) that may explain the differences between low and basic performers can be examined. Another suggestion that can be made based on the findings is to ensure that students are interested in artistic activities such as literature, poetry, music and architecture. When the home resources available to the children are examined, the biggest difference between the groups is observed in the lack of books on art, literature, architecture and music. It is important that the MoNE and provincial and district national education directorates are not limited to 100 literary classics and support students in reading classical and contemporary books. School libraries should be enriched and opportunities should be provided to students to buy discount books. Offering open access to the books by strengthening students' PC capacities and technical support, and enriching the visuals and audio recordings of the books will contribute to fostering student success as well.

Statements of Publication Ethics

This research was conducted using data from the PISA assessment collected by the OECD and open to all researchers. Ethics committee approval is not required as data is not collected by the researchers. All the rules stated in the "Higher Education Institutions Scientific Research and Publication Ethics Directive" have been complied with in the whole process from the planning of this research to its implementation, from data collection to data analysis. None of the actions specified under the title of "Actions Contrary to Scientific Research and Publication Ethics", which is the second part of the directive, were not carried out. During the writing process of this research, scientific, ethical and citation rules were followed; no falsification was made on the data. This work has not been submitted anywhere for evaluation.

Researchers' Contribution Rate

The first author mainly played a role in the development of the research problem and the interpretation of the analysis results, and the second author mainly took part in the readings based on the literature related to the research problem and the conducting the analysis.

Conflict of Interest

As the authors of the study, we declare no conflict of interest.

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Bartın University Journal of Faculty of Education BUEFAD

2023, Volume 12, Issue 1, 218-218
dergipark.org.tr/buefad

Erratum

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Erratum
Published: 20.01.2023

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The following information was added in the manuscript titled "The Analysis of Middle School Science Course Contents of Out-of-School Learning Environment Guidebooks" which was published in Volume 11 of 2022, Issue 3, https://doi.org/10.14686/buefad.990199.

"Acknowledgement

The abstract of this study was previously presented at the 2nd International Conference on Science, Mathematics, Entrepreneurship, and Technology Education, which was held in November 19-22, 2020 in Bursa, Turkey."

The citation of the manuscript: Durukan, Ü. G., Batman, D., & Aslan, A. (2022). The Analysis of Middle School Science Course Contents of Out-of-School Learning Environment Guidebooks. *Bartın University Journal of Faculty of Education, 11*(3), 517-542, https://doi.org/10.14686/buefad.990199.

Düzeltme Yazısı

2022 yılında Cilt 11, Sayı 3'te yayınlanmış olan, https://doi.org/10.14686/buefad.990199 adresli "Okul Dışı Öğrenme Ortamları Kılavuzlarının Ortaokul Fen Bilimleri Dersi İçeriklerinin Analizi" başlıklı makaleye aşağıdaki bilgiler eklenmiştir.

"Bilgilendirme

Bu çalışmanın özeti daha önce 19-22 Kasım 2020 tarihlerinde Bursa, Türkiye'de düzenlenmiş olan 2. Uluslararası Fen, Matematik, Girişimcilik ve Teknoloji Eğitimi Kongresi'nde sözlü bildiri olarak sunulmuştur."

Söz konusu makalenin atıfı: Durukan, Ü. G., Batman, D., & Aslan, A. (2022). The Analysis of Middle School Science Course Contents of Out-of-School Learning Environment Guidebooks. *Bartın University Journal of Faculty of Education, 11*(3), 517-542, https://doi.org/10.14686/buefad.990199.