INTERNATIONAL JOURNAL of CONTEMPORARY EDUCATIONAL RESEARCH

Volume 9 | Issue 1 | Year 2022 | e-ISSN: 2148-3868

JCER

IJCER

International Journal of Contemporary Educational Research

March 2022 **Volume: 9** **Issue: 1** **e-ISSN: 2148-3868**

http://ijcer.net/

Indexing
International Journal of Contemporary Educational Research is indexed by the following indices:
Education Resources Information Center (ERIC)
Directory of Open Access Journals (DOAJ)
Directory of Research Journals Indexing (DRJI)
European Reference Index for the Humanities and Social Sciences (ERIH PLUS)
Scientific Indexing Services (SIS)
Türk Eğitim İndeksi (TEİ)
Open Academic Journals Index (OAJI)
Sosyal Bilimler Atıf Dizini (SOBİAD)
Index Copernicus (ICI)

Table of Contents

International Journal of Contemporary Educational Research (IJCER)

www.ijcer.net

Why Do Students in Vocational and Technical Education Drop Out? A Qualitative Case Study

Mithat Korumaz[1], Ecehan Eksioğlu[2]
[1]Yıldız Technical University, 0000-0003-1800-7633
[2]Ministry of National Education, 0000-0002-8537-097X

Article History
Received: 08.05.2021
Received in revised form: 31.07.2021
Accepted: 30.09.2021
Article Type: Research Article

To cite this article:

Korumaz, M. & Ekşioğlu, E. (2022). Why do students in vocational and technical education drop out? A qualitative case study. *International Journal of Contemporary Educational Research, 9*(1), 1-17. https://doi.org/10.33200/ijcer.935042

International Journal of Contemporary Educational Research
Volume 9, Number 1, March 2022, Page 1-17 ISSN: 2148-3868

Why Do Students in Vocational and Technical Education Drop Out? A Qualitative Case Study

Mithat Korumaz[1*], Ecehan Ekşioğlu[2]
[1]Yıldız Technical University
[2]Ministry of National Education

Abstract

The aim of this case study is to examine the economic, social and cultural reasons behind the dropout of vocational and technical education students. The participants of the study are 23 students included in accordance with the criterion sampling method. We gathered data with semi-structured interviews. Then we analyzed data with content analysis. Themes obtained as findings of the study are vocational habitus, capital agents, how to survive and post-experience. As a finding of the study; while individual problems are the most emphasized problems experienced at school by the participants, economic reasons are the most emphasized reasons behind the dropping out of the students.

Keywords: Vocational education, Dropout, Cultural capital, Economic capital, Social capital, Vocational habitus

Introduction

Probably nothing other than dropping out so strikingly affects the life of the students after school (Winship & Korenman, 1999). Dropping out is a critical issue for the triplet of individuals, the school system, and the whole community. Those students who drop out may encounter many difficulties in their life such as working for a low-wage and low-status job. Dropout students are more prone to experiencing health problems and engaging in criminal activities (Christine et al., 2007). For instance, in the United States, 82% of prisoners are school dropouts (Goldschimidt &Wang 1999). Plank et al. (2008) support this in terms of the possibility of unemployment, inhabiting poor life conditions, supported by the government aid, offence conditions and social cost in the states and state's tax revenue. The proportion of dropping out of high school is prevalent for students in vocational training (Thøgersen et al., 2020). Being a vocational high school student facilitates this dropout. Vocational high schools are designated to meet the necessities of labor market needs. Their curricula are arranged to meet the demands of the employment market so that these students may acquire the skills necessary for the labor market (Harvey, 2001). Families send their children to these sorts of high schools to train them for a particular finesse and raise the gain in the next years (Yi et al., 2015). At this point, 'who drops out' at those kinds of vocational high schools is significant. Harvey (2001) points out those dropout students do not own the required finesse to get a profession at a good salaried, high-skill job. Elffers (2012) also claim that the students who are drug users get pregnant or commit a crime in their life except the school generate the profile of 'at risk' dropout students.

'How high is the dropout rate in Turkey?', while the proportion of vocational high schools is 34.9 % and the proportion of students within the scope of vocational training is 9.8 % in 2019 (National Center for Education Statistics, 2019), this rate is equal to 31.7 % in 2017 (National Center for Education Statistics, 2019). Compared to a few OECD countries, it is 31.7 % for Czech, 71.6 % for Finland, 70.9 % for Slovenia, 68.2 % for Holland, and 64,2 % for Switzerland (OECD, 2019). According to National Education Statistics, while the proportion of vocational high schools is 34.9 %, the dropout rate is %31 in 2019 (National Center for Education Statistics, 2019). Although the earlier proportion of leaving school is decreasing, students continue to drop out of education throughout secondary education, especially in the 9th grade (National Center for Education Statistics, 2019). When the serious results of leaving high school are examined, 'who drops out the school and what is the reason behind it?' is a significant question. There is a group of students who leave school voluntarily

* Corresponding Author: *Mithat Korumaz, mkorumaz@yildiz.edu.tr*

and those compelled to leave. When the students compelled to abandon school are dealt with, reasons behind this discharge process may be low-income or being a minority member (Rumberger & Thomas, 2000). There are many reasons for the students' dropping out of school. Azzam (2007) lists these reasons as the students' personal problems like not being interested in school and not having enough rules; Rumberger and Thomas (2000) list them as family, income, and educational background.

When the research on the reasons of dropouts up to now examined, researchers (Azzam, 2007; Baker et al., 2001; Christine et al., 2007; Glennie et al., 2012; Goldschmidt & Wang, 1999; Gottfredson & Gottfredson, 1989; Güngör, 2019; Pittmann & Haughwout, 1987; Werblow & Duesbery, 2009; Yi et al., 2015 Ziomek-Daigle & Cavin, 2015) state that school-level factors are influential on the intention of the student's dropping out. Researchers (Alspaugh, 1998; Christine et al., 2007; Elffers, 2012; Farias & Sevilla, 2015; Kılıç, 2017; Konold & Cornell, 2015; Parr & Bonitz, 2015; Polat, 2014; Porowski & Passa, 2011; Taş et al., 2013) indicate that coming from a family with low socioeconomic status tend to drop out. Besides, researchers (Aarkrog et al., 2018; Boyacı et al., 2018; Christine et al., 2007; Elffers, 2012; Plank et al., 2008; Tanggaard, 2013; Taş et al., 2013) imply that experiences of students at school, individual perspective of the students and teacher-student interaction are influential in the students' decision to drop out.

In addition, students' social capital, like the network of friends and peers, the cultural capital of students coming from the family is significant in education. Bourdieu (1973) points out that academic achievement directly depends on cultural capital and intendancy to put on in the tweedy debouche. Considering all of these, the students at vocational high schools who have more cultural capital and a habitus proper to it may be more prone to feel free and have good communication with teachers, be successful at school, and be less prone to drop out (Swartz, 1977). Taken altogether, even though a wide range of studies on dropouts has been done so far, there is a limited number of studies examining the dropouts at vocational high schools. Apart from the previous studies on the subject, this study focuses on the neglected side of vocational high schools. Accordingly, this current research aims to determine the social, cultural, and economic factors behind the dropouts at vocational high schools. It is anticipated that the key results of this study give teachers, school principals, and parents ideas about why those students drop out at vocational high schools.

Field, Habitus, Capitals and Dropout

The term 'field' points out the norms which govern the social activity area. This social activity area may be a family, public school, higher education, art, politics, economy etc. A field is arranged by the process and sorts of capital (Edgerton & Roberts, 2014; Thompson, 2008). All the fields are intertwined with large fields like education and economic fields and small ones like family. Habitus gets activated when it is in connection with 'field'. Habitus differs both in the level of society and the level of the person. Habitus is formed by the person's past, the family's personal history, and the individual's class. The habitus of individuals is not identical because of the difference of each individual (Reay, 2010).

Habitus is a social structure. Bourdieu (1988) explains this as "it is a structured body which embodies a world's innate structures and builds that world's perceptions and acts" (p.72, 78). According to Bourdieu (1990), there are no definite rules which lead an action, so habitus is indefinite. "Habitus is transmitted through speaking, standing up, walking and considering" (Bourdieu, 1990, p. 23). Habitus is a reproductive scheme in which main social structures are moulded and are reflected in the individuals through socialisation; ultimately, the main social structures are reproduced (Nash, 1999). Habitus is linked to the raising of the family and the position of an individual in a social structure (Edgerton & Roberts, 2014). Habitus is a persistent, transmittable, cognitive scheme, perception, comprehension, and action (Bourdieu, 2002). Swartz (1977) also state that habitus affects the chances of individuals in life like one's origins. The habitus of an individual manifests itself in communication, tastes, values, perceptions, and rationale. When it is considered a game, habitus displays the individual's feelings, and field shows the social field on which an individual plays this game (Bourdieu, 1998; Gaddis, 2013). From this point forth, the concept of "vocational habitus", which is based on the habitus concept of Bourdieu, is important to be mentioned. According to Colley et al. (2003), vocational habitus facilitates the process of adaptation for the students to adopt and learn a specific identity. "Being the right person for the profession" must accrue for the adaptation to learn a specific identity (Colley et al., 2003). Vocational habitus necessitates the process of adopting vocational behaviours and attitudes for adaptation. It consists of acting suitably, feeling and glancing towards the envisioned profession (Ferm et al., 2018). For the construction of identity, the effect of vocational culture cannot be ignored. It may provide the agents to consider the way of organisation of the practices in the so-called culture. Thus, it ventilates how to behave in the place of work suitably. The suitable place and practice may be realised through the vocational culture (Bourdieu, 1977; Colley

et al., 2002). Vocational culture admits accepting individuals from certain social groups and excluding those who are not suitable (Colley et al., 2002).

Vocational habitus displays the strong side of vocational culture. It is a unification of idealized and realized tendencies to which the students need to adapt themselves to become the right individuals for the profession. The emphasis is on "becoming the right person" within the context of vocational habitus. It leads to the occupation realized by the individual and the shaping process of the individual (Colley et al., 2003). To be successful, the student needs to adapt to the values and practices of the profession socially. These shared values are continually formed by the teachers, students, and employers (Colley et al., 2003). Habitus contains different kinds of capitals as content (Bourdieu, 1998; Gaddis, 2013). Capital is a mediator between field and habitus as it defines the content of the field. It is a monetary unit of the field. The product and process of the field are assessed via the capital (Grenfell, 2009). Capital determines the social world and its structure, and it is situated in the essence of the social world (Bourdieu, 1985; Thorpe, 2009). Capital with a symbolic meaning defines what can be recognized, what is possible, and what can be awarded. It belongs to the field. The field is the concept that establishes the values, and it is the individuals who own the values. Although the field is open to every individual, it is not distributed in the same proportion (Grenfell, 2009). In this context, the education system and high schools can be framed as a 'field'. The power in this field is configured by striving factors of the social echelon, which are the dissemination of economic, social, and cultural capitals (Edgerton & Roberts, 2014). When considered as a field, the "formal education system is a primary mechanism in the perpetuation of socioeconomic inequity, since it serves to legitimate the existing social hierarchy by transforming it into an apparent hierarchy of gifts or merit" (Bourdieu, 1997, p. 241-258). The reproduction of the social structure is realized due to the students' habitus, which is important for students' navigating their way (Dumais, 2002). The students' configuration within this field comes into existence through their tenancy of the habitus and the capital in this sphere. Students' practices are outcomes of students' habitus and cultural capital in the bundle of this sphere. In other words, habitus, cultural capital, and the field liaise to incur behaviors of the students in the social context (Edgerton & Roberts, 2014).

In the field of education, the most valuable capital is cultural capital. The education system represents the culture of the dominant class. Bourdieu (1973) points out that academic achievement directly depends on cultural capital and intendancy to put on in the tweedy debouche. In a field like education, there are certificates, forms of pondering, and making named cultural capital and some of them are more valuable than alternates. Cultural capital connects education with other fields (Bourdieu et al., 1995; Grenfell, 2009). The student needs the skill of getting and internalizing to gain this cultural capital. In this point, the cultural capital deriving from the family is significant, and this is related to the social class to a large extent. In the lower class, this cultural capital is less than the upper class. Besides this, the students who own more cultural capital might find their way easily throughout the curriculum, assessment, and institutional necessities. In contrast, those with less cultural capital might face more difficulties (Gale & Parker, 2017). This system is fostered by the educational system (Dumais, 2002).

Social capital consists of the relationships that constitute a group's membership, and it is a kind of shared capital ensuring power (Trainor, 2010). It implies the content and quality of the social networks that can support individual interests and turn a kind of capital into another (Bourdieu, 1986; Møllegaard & Jaeger, 2015). The social capital concept of Bourdieu is based on the theories of socially refabricating and nominal stamina. The dimension of the social capital is up to the social network and the proportion of capitals the person has within the social web (Dika & Singh, 2002). In that case, social capital can be divided into two groups; 'social relationships' and 'the quality and quantity of resources'. Social relationships consist of demanding, pretending the resources the society owns. That is to say, social capital is a mediator for retaining group solidarity. It is the instrument for reproducing the dominant class (Dika & Singh, 2002; Lin, 1999; Portes, 1998). Therefore, the social capital concept of Bourdieu cannot be grasped without the cultural capital, habitus, and field terms.
The capital, habitus, and field concepts of Bourdieu emphasize the inequality in life (Bourdieu, 1977; Gaddis, 2013). The inequalities in the capital and the habitus affect the academic results and dropout. On the one hand, the students at vocational high schools who have more cultural capital may be more prone to feel free and have good communication with teachers, be successful at school, and be less prone to drop out. At this point, the habitus of the students is very significant. Students' ability to invest in school and not drop out depends on their classification system and their achievement anticipation (Swartz, 1977). Students who do not have high cultural capital as those of high socioeconomic status. Thereby a habitus shaped by this might find the school environment very different. Not being acquainted with the dominant culture and lacking the appropriate education besides coming from a low socioeconomic status affects students' intention to drop out. Considering that there are some definite ways of communicating, attitudes and behaviours transmitted through interaction by the actors at school, the students deriving from a superior background are exposed to this kind of cultural capital

in a company with domestic life and parent-child communication. The cultural capital aids them to develop a proper habitus to go around the education system. The students with low socioeconomic status may not be exposed to the necessary cultural capital, and when they cannot display the appropriate habitus, they become disadvantageous. The schools reproduce the inequalities based on socioeconomic status. Since the teachers and education reward the dominant culture manifestations, these rewards turn into high educational success and decrease the intention of dropping out of school (Gaddis, 2013).

On the other hand, the communication between students and teachers is an important dimension for the school's social capital. The students mention the lack of academic support for dropping out before graduating (Cemalcilar & Gökşen, 2014; Croninger & Lee, 2001; Rumberger, 1987). Favourable social relations are significant for the students (Cemalcilar & Gökşen, 2014; Murdock, 2000; Stanton-Salazar, 1997). Bourdieu (1986) stresses that teachers facilitate reaching the corporation sources and might be a mediator to transmit the information and support to the adolescent. A sustentacular social environment may create strong incentives not to drop out in case there is social inequality. The student's development is shaped through social capital at schools, community, and family. Social capital affects the achievement and decreases dropouts (Acar, 2011; Israel et al., 2001; Rogošić & Baranović, 2016). When the research is examined, most of the studies are pertinent to finding out reasons for dropouts at high schools. These reasons are a classification of student characteristics, school-level factors, socioeconomic situation, and family's economic background (Alspaugh, 1998). In terms of school size, researchers (Azzam, 2007; Baker et al., 2001; Glennie et al., 2012; Gottfredson, 1989; Güngör, 2019; Pittman & Haughwout, 1987; Werblow & Duesbery, 2009;) stress that school characteristics are influential on the intention of the students' dropping out. When taken in hand as socioeconomic status, the researchers (Alspaugh, 1998; Elffers, 2012; Farias & Seville, 2015; Kılıç, 2017; Konald & Cornell, 2015; Parr & Bonitz, 2015; Polat, 2014; Taş et al., 2013;) emphasize that students having poor family relationships and indigent families tend to drop out. When taken in hand, the educational system as a field is constructed by the powerful definite components that affect the student's overall educational life and the risk of dropping out the school. Social network of the student stemming from the social capital, cultural capital that ascent from the family and habitus which is a scheme forming the idea, behavior of the students and leading them. Because these are not distributed fairly, all of these affect the whole academic life of the students. Despite all the studies on dropout students, there is a gap needed to research vocational high schools. Therefore, the current study examines why students drop out at vocational high schools and the cultural, social, and economic reasons behind this and their impacts. As the number of studies in vocational high schools is insufficient, this study will provide a usual line of vision into the field in defining the factors behind dropping out and the effects of before and after.

Method

Research Design

This study has been conducted by using the qualitative approach. In a qualitative approach, "researchers seek to preserve and analyze the situated form, content, and experience of social action, rather than subject it to mathematical or other formal transformations" (Lincoln & Denzin, 2003, p.18) and "qualitative data are analyzed and presented in the form of case studies, critiques, and sometimes verbal reports (Frey et al., 1992, p.17). As a current phenomenon, 'drop out' is handled with its own life frame. The case study research design has been utilized in this research. The significant point here is the emphasize on the context. A case study is used in a qualitative approach (Yin, 1994); pursuing the process is more of an issue (George & Bennett, 2004). A case study research has been favored in this study because it investigated the properties of a single case (Campbell & Stanley, 1963), namely the 'drop out' of a vocational high school. In a case study, one or more cases are interrogated in a context or situation. The researcher collects data in a detailed way to examine one or more cases. These sorts of collecting data may be interviewing, observing, and reporting the described cases (Creswell, 2014). Accordingly, as a single case, 'drop out' has been examined from the perspectives of the dropout students as a context at 'vocational high schools'.

Context of the Study

Vocational high schools are important in providing the country's necessary workforce, employing qualified employees, economic development, and contributing to the family economy. Vocational high schools offer a variety of courses to be studied, being different in each vocational high school, to meet the need for intermediate staff. Courses in vocational high schools are divided into two as theory-based academic courses and vocational skills training courses. Weekly class hours of vocational courses are relatively longer than culture lessons. Perception of vocational high schools in Turkey is that the student about whom there is no possibility of passing

the university entrance exam might get a job by registering to vocational high schools. Compared with other countries, there is a negative perspective towards students in vocational high schools in Turkey. Students with an unsuccessful educational background prefer vocational high schools, making it difficult for these students to acquire a profession in the future. Therefore, it may be that the expectation of academic success is low in the public's eyes. It can be considered that teachers in vocational high schools do not expect much from students in terms of success. As researchers, we are closely acquainted with the research context and the backgrounds and experiences of the students studying in this context. At this point, we would like to express some descriptive information about these situations. Students generally come from broken families, their economic conditions may be bad, and an environment where students have to work outside of school can be created. In schools, the 9th-grade levels can be very crowded; especially before the departments are divided (the class sizes may decrease with the selection of the department as the middle class and the senior class). Again, we can say with our long-term observations in these schools that the families are indifferent to the condition of the students at school, their academic achievement, and their overall situation. The students are hopeless about their future life. They do not care about a profession, a good and qualified lifestyle, and a university career; they do not communicate well with the teachers. The research has been carried out to manifest the reasons behind the dropping out of vocational high schools. The significant issue is that many students at vocational high schools drop out because they work outside school. Another portion of students are within the group of risky students to drop out; these students are compelled to abandon the school because of the difficult circumstances in their life and cannot continue their education. This study has been realized in this vocational high school since there is a serious rate of dropping out at these schools except other high schools.

Participants of the Study

Participants in qualitative research must be the ones who have enough experience to share their thoughts about the aim of the research (Creswell, 2007). In this current study, the researchers agreed on two groups of participants. The study involves 23 student participants from the vocational high school, which is the center point for the research. 19 of the students are those who dropped out because of their working outside the school. The other four intended to drop out. The researchers have preferred criterion sampling in which participants are chosen based on predetermined criteria, and it is one of the purposeful sampling methods. Criterion sampling is a purposeful sampling of cases depending on aforethought criteria (Meriam, 1988). Cases are selected because they display a variable intensely (Patton, 1990, p. 182-183). In this study, dropout or at-risk students are selected, and students whose absenteeism is at the highest limit and whose GPA is very low are selected. The table of the participants in this study is as follows:

Table 1. Participants of the study

Pseudonym	**Field of education**	**Dropout/ Intended to Leave**	**Age**
Ares	Installation Technologies and Air Conditioning	Dropout	18
Thaumas	Furniture and Design	Dropout	18
Krios	Art and Design	Dropout	24
Apollon	Art and Design	Dropout	18
Poseidon	Engine Technologies	Dropout	20
Sisyphos	Art and Design	Dropout	19
Phorkys	Furniture and Design	Intended to leave	17
Prometheus	Art and Design	Dropout	18
Arges	Installation Technologies and Air Conditioning	Dropout	18
Okeanos	Art and Design	Dropout	18
Hades	Engine Technologies	Dropout	19
Nereus	Technical Engine Technologies	Intended to Leave	16
Khaos	Installation Technologies and Air Conditioning	Intended to Leave	17
Brantes	Furniture and Design	Dropout	19
Hera	(not selected yet)	Dropout	20
Hephaistos	(not selected yet)	Dropout	17
İkarus	Engine Technologies	Dropout	18
Zeus	Installation Technologies and Air Conditioning	Intended to Leave	18
Athena	Technical Engine Technologies	Dropout	18
İapetos	Engine Technologies	Dropout	16
Dionisos	Engine Technologies	Dropout	17
Nkys	(not selected yet)	Dropout	17
Herakles	Engine Technologies	Dropout	22

As shown above, the study's criteria for selecting participants are education, being a dropout or intended dropout, and age. 23 participants have been interviewed to collect data for the study. The participants consist of dropout students and students who intend to leave vocational high schools. Among these participants, four of

them intended to leave school. The field of education includes installation technologies and air conditioning, furniture and design, art and design, engine technologies, and technical engine technologies. The ages of the participants range from 17 to 24. Furthermore, participants have been given pseudonyms from mythical gods because of the analogy between the gods' being extra-ordinary and special and the students' being in a special condition.

Data Collection

Before collecting the research data, permission was first requested from Yıldız Technical University's Ethics Committee. Research permission dated the 10th of February was obtained. The consent form was sent to participants to sign. They were informed that their participation in the study was voluntary, and they could withdraw from the study at any time and that their responses were confidential. The researchers used pseudonyms to protect participants' identities and ensure confidentiality. After scanning the literature about dropouts, 7 questions have been directed to the participants who dropped out and 5 questions to those who intend to leave school. The questions have been presented to an expert on the field, and revisions have been made accordingly. The researchers invited dropout participants to school, and the interviews were conducted there. The semi-structured face-to-face interviews were done in January 2021. Each interview lasted 30-40 minutes. Each participating student had equal and enough amount of time to share their experiences. The participants have been informed about the purpose of the study. The participants' views have been recorded online with their permission. When the interview process ended, the records were erased, accompanied by their approval of the recordings in the transcripts. The approvals of the participant students about the transcripts have been obtained.

Data Analysis

Audio-visual records have been transcribed after the interviews. The researchers have analyzed the data through content analysis to gain reliability in the findings. Content analysis is a research method through which the event is depicted systematically and objectively (Krippendorf, 1980). It permits the researcher to test the issues to increase the meaning of the data. The words are divided into categories that are associated with each other. After dividing into categories, the same meaning may be obtained from the words and sentences (Cavanagh, 1997). Through this method, it has been managed to reveal suppressive meanings in this research. The transcriptions have been read over and over again. Codes, categories and themes have been determined properly.

Findings

The analysis of the transcripts of individual interviews put forward that "lack of sleep" as the individual problem is the most emphasized concept many participants agree on as the most significant problem experienced at school based on the vocational habitus theme. The participants' views also support that their desire to earn money without studying is why they drop out, based on the theme of capital agents. The conditions requisite for not dropping out are improving the length of class hours and academic achievement based on the theme of how to survive. Finally, the participants state that while their economic capital has improved, their social and cultural capital has been influenced badly based on the theme of post-experience. In short, the themes are identified as follows: vocational habitus, capital agents, how to survive, and post-experience.

Theme 1: Vocational Habitus

The findings exhibit that the most significant problem of the dropout students at the school can be associated with the theme "vocational habitus". This theme may be divided into four categories: individual problems, teachers' behaviors, lesson design, school environment and peer groups. For instance, one of the participants defines his problem about drug use as follows:

I had a girlfriend at this school. We had a very sincere relationship. When I got angry with her, I didn't go to school and couldn't sleep at night. I was getting bored with school. Besides, I was getting antidepressant drugs, so I was sleeping day and night. The lesson began at half-past eight. I was sleeping at the lesson, and when I got up, it was the lunch break. I was experiencing a lack of sleep because of my problems with my girlfriend and drugs (Okeanos, dropout, 18).

Under the category "individual problems", the participants emphasised the students' inability to concentrate on the lessons, getting bored, not caring about, and not being interested in lessons. For instance, a participant identifies this problem with him not being interested in the lessons as follows:

I had problems not with the school but with the lessons. I wasn't attending the lessons. I was studying, but I didn't want the lessons. I wasn't mindful of the lessons and not being able to achieve, so I couldn't like the school. The school was good, but I didn't enjoy the lessons (İapetos, dropout, 16).

Another category, "the behaviours of teachers", has been associated with the teachers' not being understanding, being unable to manage the class, taking a stand towards the students, and discrimination among the students by the participants. One of the participants signifies his problem about the teachers' not being able to manage the class and their unfavourable behaviours towards students as follows:

I had to study with people younger than me in my second grade because of my grade repetition. My friends next to me would be pampered. To be honest, the teachers couldn't silence the students and manage the class. There was also a teacher whose actions and behaviours were bossy. She uttered these sentences "Nobody can interfere with me, I do this and that". I'd reach that nobody can do something like this to me. She slapped me when we met for a second time. She threatened me by saying, "no one can save you, even your family". She caused other teachers to take a stand against me (İkarus, dropout, 18).

The other category, "lesson design", has been related to the participants' length of class hours, poor grades, and quantitative and verbal lessons. One of the participants explains the problem with the duality between the lessons at school and apprenticeship as follows:

We say that we are going to get a job in the future. We are students at vocational and technical high schools. We learn a few things about the profession in the apprenticeship. When I ask a welding master to teach me how to weld, he says, "I can't teach you. You can come and try in your lunch break". However, a person can't do things they don't know. The system at the school and apprenticeship place is different (Phorkys, intended to leave, 17).

The other category, "school environment and poor grades", are related to the circle of friends, psychological pressure, fights, the environment with blasphemy and other bad habits, and girlfriends. One of the participants states the psychological pressure caused by her friends at school and the environment as follows:

There were types who tried to crush anyone who was hanging out like a punk. This was one of the most important reasons that drowned out the school. There was politics at school. It was as if the school was separated into right and left wings. The grouping was too much. There were groups like gangs at the school. They were exchanging words at passers-by, glaring. This situation was very disturbing. This psychological pressure is enough for people (Hera, dropout, 20).

In this context of the theme of "vocational habitus", it can be inferred from the participants' discourse that the student participants address the individual problems as the most significant problem they have experienced at school. They emphasise working outside school and not being able to come to lessons on time, and feeling tired at the lessons. Besides this, they stress emotional affairs such as using drugs and not being able to listen to the lesson as a result of it. Among the individual problems, the participants accentuate not being interested in the lessons, concentration problems, and getting bored as significant problems. Furthermore, the participants mention the teachers' not being supportive, being low-tolerant towards them, putting in them very much about the extra academic subjects, and not being able to manage the class properly as an important problem at school. It can be deduced from the participants' discourse that the students' failure discourages them since they are not interested in the subjects, and the duality between the situation at school and apprenticeship place makes them unenthusiastic for the school. The participants stress their dissatisfaction with their friend circle and bullying behaviours of their friends as a significant problem for them.

Theme 2: Capital Agents

The findings emphasise that the participants' intention to leave school and drop out can be associated with the "capital agents" theme. This theme may be divided into five categories: economic reasons, academic failure, indifference to school/learning, social background, and uncertainty in expectations. Under the category of "economic reasons", the desire to earn money without studying and go into professional life is the most emphasised statement. For instance, Herakles, who is a dropout, explains his desire to earn money as follows:

I started working after I failed the class. I was a waitress at that time. When I was a waitress, I was paid weekly, and it sounded very sweet. For example, I was getting 1000 TL per week. At that time, the minimum wage was maybe 800 TL. I was working for 12 hours and was getting 1000 TL. My family didn't need it, and I was spending this money. Although I was 16-17 years old at that time, I was making very good money (Herakles, dropout, 22).

Another participant expresses his ideas about the importance of money over having an education. That shows us the negative impact of social capital with the help of negative peer-network as follows:

Most of my friends dropped out of school. They had money in their pockets. They say, "Look, you don't have money in your pocket, let's get you to work, the craftsman say that they are looking for employees". It makes sense to think about it a little bit like that. When you work, you see the repatriation of the money. They call it "the hot side of money". The man counts 5-6 billion coins in front of you every day. This is what attracts people. When people say, "don't ask your father for money, how old are you, do you still ask your parents for money," you inevitably have to work (Zeus, intended to leave, 18).

Another category, "academic failure", has been associated with their failing the class by the student participants. One of the participants explains his failure experience and his dissatisfaction with this situation as follows:

When I failed the class, I thought that my friends would be 10th-grade students and I would be a 9th-grade student. I considered that I would study with one year younger students than myself. I dropped out the school by saying, "I don't want to go on." (Herakles, dropout, 22).

The other category, "indifference to school/learning", has been associated with waste of time, not caring about the school, not endeavouring to achieve, belief in failure, not demanding the education uttered by the student participants. "Waste of time" is the most stressed phrase. One of the participants who intend to leave school expresses his ideas about the school's being a waste of time as follows:

Waste of time, teacher. When you look outside, some do not go to school, but they go on their education in evening high school. Some finish high school this way. They are not educated in high school. They spend their time working. They are taking more confident steps in this direction. We are wasting our time at school. It makes more sense to work and earn a diploma from evening high schools (Phorkys, intended to leave, 17).

Another category, "social background", has been associated with bad environmental conditions. One participant expresses his ideas about this and its effect on his life after school as follows:

I continually wanted to change my environment. I got bored of the same environment and the same people. It didn't do much for me. They say that the fate of a person is the same where they grew up. If you are growing up in a bad place or trying to grow up in a bad place, you are inevitably drawn to that environment. The environment in which I grew up wasn't good in those times. Some people had the idea of crushing and breaking down in my neighbourhood when I was studying (Krios, dropout, 24).

Another category, "uncertainty in expectations", has been associated with the desire for a different kind of lifestyle, going on their education in a different field, and hopelessness about the future. One of the participants expresses his ideas about his desire for a different kind of life as follows:

I had no idea about what kind of a person I should have been. I didn't want to lead an ordinary life. I had been pondering upon these for a long time. I have opened a café, and maybe I can move forward with this. I had a dream to go to Europe. If I had an education in a language school, maybe I could have a chance. I had no idea about what to do in the future. I didn't want to work to earn only 4-5 thousand Turkish liras (Apollon, dropout, 17).

In this context of the theme "capital agents", it can be inferred from the participants' discourse that economic reasons take the lead. It can be realised that the participants demand to enter into business life and earn money as soon as possible to not depend on their family. Besides, academic failure and failing the class are discouraging experiences pushing them to drop out the school. Additionally, their indifference to school is affected by perceiving the time wasted at school as irrational and unnecessary and considering working life over school life. The tough social background they have grown up in is an important factor in dropping out of school. Uncertainty about expectations, disbelief and hopelessness about the future, and making a wrong decision while selecting their field are significant factors behind dropping out of school.

Theme 3: How to Survive

The findings accentuate that the situations that will discourage leaving school can be associated with the theme "how to survive". This theme may be divided into four categories: the curriculum's organisation, improvement of economic conditions, perception of school, and familial conditions. Under the "organisation of the curriculum" category, length of class hours and academic achievement is the most emphasised statement. One of the participants states his dissatisfaction about the block classes and off days as follows:

There were continually block classes at the school, and we were getting bored. Actually, I wouldn't have got bored if we had had half-hour lessons, not block classes. If our off days had been 3 days and not 2, it would be more rational. Maybe Wednesday could have been a holiday in the middle of the week (Athena, dropout, 18).

Another category, "the improvement of economic conditions", has been associated with income and money by the participants. One of the participants expresses the effect of tough economic conditions on his decision as follows:

My mother quit work. We should have done something to survive, so we decided to open a café. The store expenses were very expensive there, so we had to move. We were middle income. But when we moved to another place, we had a little difficulty. If my mother hadn't quit the work and we hadn't moved to another place, I could continue my education (Apollon, dropout, 17).

Another category, "perception about the school", has been associated with courses of interest, inequity, and the participants' dream job. One of the participants expresses his distaste about the education system and his courses of interest as follows:

I wouldn't drop out of school if the education system were improved. It is as if we are in a race. Everybody should be free. If I'm a student at fine arts, mathematics will be of no use for me. We know arithmetic's in our daily life, anyway, and they are the subjects of 4th grade. We have studied these subjects for 6 or 7 years. It is of no use to study them again in 9th grade. If you are a student whose course of interest is visual arts, you draw pictures and study at a workplace. For instance, there wasn't a computer lab in our school. If there were a computer lab, I wouldn't need an extra computer (Nkys, dropout, 17).

It might be inferred from these quotes that although these students have been educated in fields like pipework and engine technology, they tend to get a profession such as a hairdresser, which is different from the fields they have studied. The participants have a completely distinct tendency apart from their vocational habitus. The profession of hairdressers is contrarian to the vocational habitus in which they have been educated to get the proper job following their skills and vocational culture.

Another category, "familial conditions", have been related to the family's educational background, long-lasting disease among the family members and the integrity of family institution by the participants. One of the participants expresses his opinions about his unwillingness to live with the financial support of his family as follows:

If you continue your education, you have to depend on your family for a living. You expect them to buy something. My parents were divorced, and our situation was apparent. When I told my father that I needed a computer and I had a dream, he sent me his own computer worth 1000 Turkish Liras. I might use it only for limited purposes. You can't raise the level. If I left the school and earned my money by working somewhere, I could buy my own needs (Nkys, dropout, 17).

In the theme, "how to survive", it can be deduced that the length of class hours and academic achievement are important conditions to prevent the students from dropping out of school. The block classes, 11-12 hours of classes in a day, and academic failure are undesirable conditions for their education. These conditions should be altered in a better way to prevent them from dropping out of school. Besides, improvement of the family's economic conditions and income are stated as dissuasive conditions for not dropping out the school. Furthermore, their distaste about the education system and the duality between their dream job and their field of education are conditions to be improved to survive and give up the idea of dropping out of school. Lastly,

familial conditions, the integrity of the family institution, and the family's educational background are considered significant conditions not to drop out of school.

Theme 4: Post-experience

The findings exhibit that the condition of economic, social, and cultural life after dropping out of school can be associated with the theme "post-experience". This theme may be divided into three categories: the increase of economic capital, the decrease of social capital, and the decrease of cultural capital. Under the category "increase of economic capital", many participants mentioned the increase of economic capital after dropping out of school. Still, some claim the decrease of their economic capital. One of the participants expresses the improved condition of their economic capital as follows:

Fortunately, we have been in better conditions economically. We didn't have an automobile and a car in those times, but now we have both of them. I sometimes talk to myself. I wish I hadn't dropped out of school. I pay 5000 Turkish liras yearly to get a diploma. Our economy is better now (Herakles, dropout, 22).

Another category the decrease of social capital has been expressed by one of the participants as follows:

Educated people make educated friends, and uneducated people make uneducated friends. We may think like this. If I kept on my education, I would meet with my educated friends. For instance, if you are a teacher, your teacher friends are more than the number of your old friends. I'm a cook. I have the telephone numbers of my cook friends. When I got into the business of selling cars, I had the telephone numbers of many car sellers. If I had an education, I would have educated friends (Poseidon, dropout, 20).

Another category, the decrease of cultural capital, has been associated with the participants' decrease in sport and cultural activities. One of the participants states the influence of dropping out the school on the decrease of cultural capital as follows:

I was interested in sports, and I had more opportunities to do it when I was a student. Now that I work, I don't have enough time. When I was a student, we had Physical Education Lessons. We could do sports at least two days a week. I can only do sports for half an hour a week now. Sometimes I can never do it in a week (Ares, dropout, 18).

In addition to these, it can be realised that dropout students are regretful about cultural capital results. They are not pleased with their condition because of their lack of diploma to get into a high-wage, high-status job. Lack of a diploma is the most emphasised word uttered by the participants as the reason for their regret. One of the participants expresses this condition as follows:

If I quit this job and try to get into an authorised place, I don't have a chance to do this because they prefer those with a high school diploma. There is a bad side to this condition. Apart from this, I can go wherever I want. The only nuisance is my lack of a diploma (Hades, dropout, 19).

In the context of the theme of "post-experience", it can be inferred from the participants' discourse that a great deal of the students touches upon the increase of economic capital by implying the escalatory amount of time at work and regular working schedule. Concerning the social capital, the participants stress the decrease of time spent with friends and having an enjoyable time out. Concerning the cultural capital, participants stated that leisure time activities like sports and music are not possible to do as much as in school because of the lack of time and energy, since they spare time to work. Apart from these, the participants express their regret about gaining cultural capital, which may be a touchstone for them in the future. It can be deduced from their statements that they are regretful for not receiving their high school diploma, which will be very significant for them to be employed in high-wage and high-status jobs. This condition can be associated with the importance of cultural capital for the participants. The participants stated that not having the opportunity to be together with old friends and not having an enjoyable time is regret. It can be stated that they express their longing for their old friends at school sincerely.

Discussion and Recommendations

The study findings reveal that individual problems like lack of sleep, not being able to concentrate on the lessons, getting bored from the lessons, and not being interested in the lessons are expressed as the most

significant problems. On the one hand, the participants state that working somewhere out of school and using drugs were reasons for their lack of sleep. Furthermore, they define the most significant problem at school as their inability to concentrate on the lessons. Similarly, Azzam (2007) also states that not being interested in the school and insufficient rules at the school are important reasons for dropping out of school. At this point, the research finding of Azzam (2007) may be attributed to this relevant study. Besides, the teachers are described as inconsiderate and incompetent to manage the class. It is identified as a significant problem at the school. At this juncture, the findings of the researchers (Aarkrog et al., 2018; Boyacı et al., 2018; Christine et al., 2007; Elffers, 2012; Plank et al., 2008; Tanggaard, 2013; Taş et al., 2013) support this relevant study by indicating that the experiences of students at school, individual perspectives of the students, and teacher-student interaction are influential on the students' decision to drop out. In addition to this, communication between students and teachers is a consequential dimension for the students' social capital. Bourdieu (1986) also claims that the teacher's support is notable for the social capital, and hereat social capital influences achievement and lessens dropping out.

The students' not having the chance to select the lessons they are interested in, the length of class hours, and the duality between the apprenticeship and the school are significant problems. These can be associated with school-level factors. Similarly, the researchers (Azzam, 2007; Baker et al., 2001; Christine et al., 2007; Glennie et al., 2012; Goldschmidt & Wang, 1999; Gottfredson & Gottfredson, 1989; Güngör, 2019; Pittmann & Haughwout, 1987; Werblow & Duesbery, 2009; Yi et al., 2015; Ziomek-Daigle & Cavin, 2015) also state that school-level factors are influential on the intention of the students' dropping out. The participants' having a circle of friends leading to an unsatisfactory condition at school, bad habits, an undisciplined environment, and alienation from the school are also important problems. The students' circle of friends may be affiliated with the social capital of the students. Based on the study's findings, dropping out of school can be associated with economic reasons, academic failure, indifference to school/learning, social background, and uncertainty in expectations. Most participants state their reason to drop out of school is that they view working life as more profitable than school life. According to them, even at an early age, they may earn a lot of money without education. Going into a profession is more rational because of its financial gain. Earning their own money is more accredited to demonstrate themselves to their environment as worthy of attention. Their time is wasted at school. Dropping out the school is more rational. The participants complained about the conditions of the university grades in Turkey. The students also emphasise academic failure, its effects on their emotions and behaviours. Academic failure can be related to the lack of cultural capital since education and cultural capital are linked, and the education system represents the dominant class's culture. Bourdieu (1973) also stresses the relationship between academic achievement and cultural capital. According to him, there are certificates and certain ways of thinking in education. Some of them are more notable than others. The students need to know how to gain this cultural capital and be skilful to attain it. At this point, as a reason for the participants' dropping out of school, the lack of cultural capital regarding academic failure may not be underestimated. It can be inferred that the participants covertly imply the lack of cultural capital as a pushing factor to drop out of school.

Besides, growing up in a bad environment and their neighbourhood are expressed as pushing factors to drop out of school. The bad and harsh environmental conditions may be associated with habitus and low socioeconomic conditions. Bourdieu (1988) explains habitus as "it is a structured body which embodies a world's innate structures and builds that world's perceptions and acts" (p.72, 78). "Habitus is transmitted through speaking, standing up, walking and considering" (Bourdieu, 1990, p. 23). According to Gaddis (2013), people with low socioeconomic conditions may not have the necessary cultural capital, and when they cannot display the suitable habitus, they become disadvantageous. The schools create inequality based on socioeconomic status. The education system rewards the dominant culture; this kind of reward converts into academic achievement and reduces the risk of dropping out. Correspondingly, the relevant study emphasises that the participants are pushed into dropping out of school because of the habitus and harsh environmental conditions. The participants are hopeless about their future. Their dreams and reality are on disparate and sharp edges. Their dissatisfaction with their field, their desire for their field of interest, and the gap between them are significant reasons to drop out of school. This situation of the participants may be related to the "vocational habitus". According to Colley et al. (2003), vocational habitus catalyses the process of learning and adopting a definite identity. Vocational habitus is necessary to adapt and gain suitable actions and feelings towards the envisioned profession (Ferm et al., 2018). Vocational culture accepts the ones from certain social groups and eliminates those that are not (Colley et al., 2002). The students need to accommodate themselves both to the values and practices of the profession socially. These shared values are consistently formed by the teacher, student, and employer (Colley et al., 2003). From this point forth, the participants complain about their dissatisfaction with the field and so-called not "being the right person for the job" since their vocational habitus is different. It can be inferred from their statements that they do not have the proper values of the profession and vocational culture. They long for another field in

their dreams, and as a result, they are excluded. The exclusion process may be associated with the students' dropping out of school.

The necessary conditions to not drop out are stated as the length of class hours and academic achievement under the category 'organisation of the curriculum by the participants'. According to them, 11, 12, or 13 hours of lessons a day and block classes are boring and tiring. Low academic achievement is demoralising to go on their education. Another factor not to drop out of school is the improvement of economic conditions. The participants mention the low-income level of their family and tough economic conditions as effective factors to drop out of school and indicate that if their family's economic conditions had been better, they would not have dropped out. Similarly, the researchers (Alspaugh, 1998; Elffers, 2012; Farias & Seville, 2015; Kılıç, 2017; Konald & Cornell, 2015; Parr & Bonitz, 2015; Polat, 2014; Taş et al., 2013) emphasise that students with poor family relationships and indigent families tend to drop out. It may be stated that better economic conditions may influence the participants' decision not to drop out of school.

The participant's perception of the school, the difference between their dream job and their educational field, and their reluctance towards some lessons are influential on their decision to drop out of school. They state that if they had been given a chance to get an education on the field they dreamed of, they wouldn't have dropped out of school. The participants mention familial conditions like the family's educational background and the integrity of the family institution. They state that if the educational background of their parents had been better and their parents had not been divorced, they would not have dropped out of school. Concerning the family's educational background, Gale and Parker (2017) stress the cultural capital stemming from the family. It is associated with the social class to a large extent. Accordingly, the cultural capital in the lower class is less than the cultural capital in the upper class. Students with more cultural capital might face difficulties more easily and be successful. From this point, it may be stated that the family's educational background as a cultural capital may influence the decision of the students not to drop out of school. As a finding of the study, the participants' economic, social, and cultural life after dropping out may be analysed under the categories of increase of economic capital and decrease of social and cultural capital. While many of the participants mentioned the increase of income in their family and regular working hours, some mention the extravagant styles of spending their money gained after dropping out. As the decrease of social and economic capital, the participants' reason their exhaustion and lack of time. They mention their large circle of friends at school times. They state that they cannot do sports and cultural activities since they do not have enough time and energy. It is also expressed that strict conditions of working life are influential on this decrease.

The decrease of social and cultural capital may also be associated with their regret because they dropped out of school. They predicate their regret with the unattained diploma to become a university student and have a better status with more job alternatives in the future. Besides, they are aware of the knowledge side of this situation. They state that they will not have a notable accumulation of knowledge due to dropping out of school. This condition can be linked with the importance of cultural capital. According to Christine et al. (2007), the students work in low-wage and low-status jobs due to decreased cultural capital. According to Bourdieu (1973), certificates are significant to gain cultural capital and learn how to act and think in the education system. It may be noticed that the students feel the deficiency of the cultural capital after dropping out of school by stating the attained diplomas. In addition to this, the participants' discourse states that they are also regretful about their old school environment and circle of friends. It can be noticed that they long for this atmosphere and circle of friends. This condition can be linked with the importance of social capital. Social capital is significant because of the friend circle and social network in terms of education. It includes the fundamental kinds of relationships for the membership of a group (Trainor, 2010) because it is a mediator to support the individual interests and turn one capital into another (Bourdieu, 1986; Møllegaard & Jaeger, 2015). It is linked to the social network and the proportion of capital within the social web. It provides the group solidarity as an agent (Dika & Singh, 2002). Similar to the relevant study, the researchers (Acar, 2011; Israel et al., 2001; Rogošić & Baranović, 2016) have found that social capital influences success and decreases dropping out. They also emphasise that the development of the student at the school is shaped through social capital, society and family. It can be deduced from the overall analysis of the participants' discourse that dropping out of high school is common for students in vocational high schools, as Warts and all and Thogerson et al. (2020) stated. Students at vocational high schools drop out more easily. Although students are sent to vocational high schools to gain particular skills and finesse, they can face difficulties getting their education (Yi et al., 2013). Habitus, social, cultural, and economic capitals influence their decision and push them towards dropping out of school. It can be concluded that if they had been grown up in a proper habitus with the values supported by the education system, had a good position in the social system, had a cultural capital coming from the family, had the economic capital necessary for their education, had a better socioeconomic background, had social capital with a large circle of a social network, and had support from their teachers; they might not drop out of school and continue their education. In addition to

these, vocational habitus is significant for being the right person for the job. The apprenticeship and the school environment need to be consonant to create a suitable vocational culture and the students' contentment since it is necessary to get a specific identity.

The relevant study contributes to the Bourdieuan literature by inquiring about the effects of social, cultural, and economic reasons behind dropping out. The importance of the social, cultural, and economic capital is perceptible through analysing the participants' statements. For future researches, the context of the study may be enlarged to different schools and districts to obtain various points of view from different contexts. The gender of the participants can be equalised or be in a similar proportion in both boy and girl student participants. The interviews may be conducted with a focus group instead of one-on-one interviews so that the participants may interact and share their experiences. To the final remark in this study, the proportion of dropout students at vocational high schools is a significant issue for teachers, policy makers, and educational administrators. The teachers and school principals may support the students more even when they show slow progress in the school environment. The teachers may be more tolerant and understanding towards them. Family members also have a great mission to accompany them in their education, both materially and nonmaterial. Last but not least, the importance of vocational high schools is great when considered in terms of the country economy and the needs of some industry segments. Each dropout student is a loss in this respect.

Author (s) Contribution Rate

Both researchers contributed at every stage of the research.

Conflicts of Interest

There is no conflicts of interest

Ethical Approval

Ethical permission (10/02/2021 – E.2102150050) was obtained from Yıldız Technical University for this research.

References

Aarkrog, V., Wahlgren, B., Larsen, C. H., Mariager-Anderson, K., & Gottlieb, S. (2018). Decision-making processes among potential dropouts in VET and adult learning. In C. Nägele & B. E. Stalder (Eds.), *Trends in vocational education and training research. Proceedings of the European Conference on Educational Research (ECER), Vocational education and training research. Proceedings of the European conference on the Educational Research (VETNET)* (1-9).

Acar, E. (2011). Effects of social capital on school success: A narrative synthesis. *Educational Research and Reviews*, *6*(6), 456–461.

Alspaugh, J. W. (1998). The relationship of school-to-school transitions and school size to high school dropout rates. *High School Journal*, *81*(1), 154–121.

Azzam, A. (2007). Why students drop out. *Educational Leadership*, *64*(7), 91–93

Baker, M. L., Sigmon, J. N., & Nugent, E. M. (2001). *Truancy reduction: Keeping students in school*. Washington, DC: U.S. Department of Justice, Office of Justice Programs, Office of Juvenile Justice and Delinquency Prevention

Bourdieu, P. (1973). Three forms of theoretical knowledge. *Social Science Information, 12*(1), 53-80

Bourdieu, P. (1977). *Outline of A Theory of Practice*, Cambridge University of Press.

Bourdieu, P. (1985). The market of symbolic goods. *Poetics 14*(2), 13–44

Bourdieu, P. (1986). *The forms of capital*. In J. G. Richardson (Ed.), Handbook of theory and research for the sociology of education, 241-258. Greenwood

Bourdieu, P. (1988). *Homo Academicus*. Stanford University Press.

Bourdieu, P. (1990). *Language and symbolic power*. Harvard University Press

Bourdieu, P., Passeron, J.-C., & de SaintMartin, M. (1995). *Academic discourse*. Stanford University Press

Bourdieu, P. (1997). The forms of capital. In A. H. Halsey, H. Lauder, P. Brown, & A. S. Wells (Eds.), *Education, Culture, Economy, Society* (pp. 47-58). Oxford University Press

Bourdieu P. (1998). *Acts of Resistance: Against the Tyranny of the Market*. Free Press

Bourdieu, P. (2002). *The Politics of Globalization*, Le Monde

Boyacı, A., Karacabey, M. F., & Öz, Y. (2018). Organizational problems challenging the capacity of open vocational high schools in dealing with the school dropouts. *Turkish Online Journal of Qualitative Inquiry*, *9*(1), 1-25

Campbell, D. T., & Stanley, J. (1963). *Experimental and Quasi-Experimental Designs for Research*, Houghton Mifflin

Cavanagh, S. (1997). Content analysis: concepts, methods and applications. *Nurse Researcher, 4*(3), 5-16

Cemalcilar, Z., & Gökşen, F. (2014). Inequality in social capital: Social capital, social risk and drop-out in the Turkish education system. *British Journal of Sociology of Education*, *35*, 94–114. https:// doi:10.1080/01425692.2012.740807

Christine, C. A., Jolivette, K., & Nelson, C.M. (2007). School characteristics related to high school dropout rates. *Remedial and Special Education*, *28*(6), 325-339

Colley, H., James, D. & Tedder, M. (2002). Becoming the 'right person for the job': vocational habitus, gender and learning cultures in further education, paper presented to the *Learning and Skills Development Agency Annual Research Conference*, University of Warwick.

Colley, H., James, D., Tedder, M. & Diment, K. (2003) Learning as becoming in vocational education and training: class, gender and the role of vocational habitus. *Journal of Vocational Education and Training*, *55*(4), 471-496

Creswell, J. W. (2014*). Research Design: Qualitative, Quantitative and Mixed Methods Approaches*, Sage Publications

Croninger, R. G., & Lee, V. E. (2001). Social capital and dropping out of school: Benefits to at-risk students of teachers' support and guidance. *Teachers College Record*, *103*, 548–581

Dika, S. L., & Singh, K. (2002). Applications of social capital in educational literature: A critical synthesis. *Review of educational research*, *72*(1), 31-60.

Dumais, S. (2002). Cultural capital, gender, and school success: The role of habitus. *Sociology of Education, 75*(1), 44-68.

Edgerton, J. D. & Roberts, L.W. (2014). Cultural capital or habitus? Bourdieu and beyond in the explanation of enduring educational inequality. *Theory and Research in Education*, 193–220.

Elffers, L. (2012). One Foot out the School Door? Interpreting the Risk for Dropout upon the Transition to Post-Secondary Vocational Education. *British Journal of Sociology of Education, 33*(1), 41–61.

Farías, M., & Sevilla, M. (2015). Effectiveness of vocational high schools in students' access to and persistence in postsecondary vocational education. *Research in Higher Education, 56*(7), 693–718.

Ferm, L., Thunqvist, D. P., Svensson, L., & Gustavsson, M. (2018). Students' strategies for learning identities as industrial workers in a Swedish upper secondary school VET programme. *Journal of Vocational Education and Training*, *70*(1), 66–84.

Frey, L. R., Botan, C. H., Friedman, P. G., & Kreps, G. L. (1992). Survey interview research. In L. R. Frey, C. H. Botan, P. G. Friedman, & G. L. Kreps (Eds.), *Interpreting communication research: A case study approach* (pp. 125-160). Prentice Hall

Gaddis, M.S. (2013). The influence of habitus in the relationship between cultural capital and academic achievement. *Social Science Research*, 42, 1–13

Gale, T., & Parker, S. (2017). Retaining students in Australian higher education: Cultural capital, field distinction. *European Educational Research Journal*, *16*(1), 80–96

George, A. L., & Bennett, A. (2004). *Case Studies and Theory Development*, MIT Press

Glennie, J., Harley, K., Butcher, N., & van Wyk, T. (2012). Open educational resources and change in higher education: Reflections from practice. *UNESCO-Commonwealth of Learning.*

Goldschmidt, P., & Wang, J. (1999). When can schools affect dropout behavior? A longitudinal multilevel analysis. *American Educational Research Journal*, *36*, 715–738.

Gottfredson, G. D., & Gottfredson, D. C. (1989). School climate, academic performance, attendance, and dropout. (ERIC Document Reproduction Service No. ED 308225)

Grenfell, M. (2009). Applying Bourdieu's field theory: The case of social capital and education. *Education, Knowledge and Economy*, *3*, 17-34

Güngör, G. (2019). *Mesleki ve Teknik Ortaöğretimde Okul Terkinin Nedenleri ve Çözüm Önerileri: Bütüncül Bir Program Önerisi* (Publication No: 566855) [Doctoral Thesis – Kocaeli University] Council of Higher Education Thesis Centre https://tez.go.yok.tr/UlusalTezMerkezi/tezSorguSonucYeni.jsp

Harvey, L. (2001). Defining and measuring employability. *Quality in Higher Education*, *7*(2), 97-109. http://dx.doi.org/10.1080/13538320120059990

Israel, G. D., Beaulieu, L. J., & Hartless, G. (2001). The influence of family and community social capital on educational achievement. *Rural Sociology*, *66*(1), 43–68

Kılıç, V. P. (2017). School dropout tendency among vocational high school students, *2017 Conference Proceedings*, Erte Congress

Konold, T., & Cornell, D. (2015). Measurement and structural relations of an authoritative school climate model: A multi-level latent variable investigation. *Journal of School Psychology, 53, 447-461*

Krippendorff, K. (1980). *Content Analysis: An Introduction to its Methodology*. Sage Publications

Lin, N. (1999). Building a network theory of social capital. *Connections, 22*, 28-51.

Lincoln, Y. S. & Denzin, N. K. (2003). *Turning points in qualitative research: Tying knots in a handkerchief*. AltaMira Press/A Division of Rowman & Littlefield Publishers, Inc.

Møllegaard, S., & Jaeger, M. M. (2015). The effect of grandparents' economic, cultural, and social capital on grandchildren's educational success. *Research in Social Stratification and Mobility, 42*, 11–19.

Murdock, T. B. (2000). Incorporating economic context into educational psychology: methodological and conceptional challenges. *Educational Psychologist, 35*(2), 113–124

Nash, R. (1999). Bourdieu, 'habitus', and educational research: Is it all worth the candle. *British Journal of Sociology of Education, 20*(2), 175–187

National Center for Education Statistics, IPEDS Data Center (n.d.). https://nces.ed.gov/ipeds/datacenter/selectVariables.aspx

Organization for Economic Co-operation and Development, OECD. (2019). Education at a Glance 2020: OECD Indicators. OECD Publishing. https://www.oecd-ilibrary.org/education/enrolment-rates-of-children-under-the-age-of-3-in-early-childhood-education-and-care-by-age-2017_5ff73524-en

Parr, A. K., & Bonitz, V. S. (2015). Role of family background, student behaviors, and school-related beliefs in predicting high school dropout. *The Journal of Educational Research*, *108*(6), 504–514. https://doi.org/10.1080/ 00220671.2014.917256

Patton, M. Q. (1990). *Qualitative Evaluation and Research Methods*. Sage

Pittman, R. B., & Haughwout, P. (1987). Influence of high school size on dropout rate. *Educational Evaluation and Policy Analysis*, 9(4), 337-343

Plank, S. B., DeLuca, S., & Estacion, A. (2008). High school dropout and the role of career and technical education: A survival analysis of surviving high school. *Sociology of Education*, *81*, 345–370. https:// doi:10.1177/003804070808100402

Polat, S. (2014). Reasons for school dropout in vocational high school. *Educational Research and Reviews*, *9*(18), 711-718

Porowski, A., & Passa, A. (2011). The effect of communities in schools on high school dropout and graduation rates: Results from a multiyear, school-level quasiexperimental study. *Journal of Education for Students Placed at Risk*, *16*(1), 24–37. https:// doi:10.1080/10824669.2011.545977

Portes, A. (1998). Social capital: Its origins and applications in modern sociology. *Annual Review of Sociology*, *24*, 1-24

Reay, D. (2010). Sociology, social class and education. In Michael W. Apple, Stephen J. Ball & Luis Armando Gandin (Eds.), *The Routledge International Handbook of the Sociology of Education*, 396–404.

Rogošić, S., & Baranović, B. (2016). Social capital and educational achievements: Coleman versus Bourdieu. *Center for Educational Policy Studies Journal*, *6*(2), 81–100.

Rumberger, R. W. (1987). High school dropouts: A review of issues and evidence. *Review of Educational Research*, 57, 101–121.

Rumberger, R. W., & Thomas, S. L. (2000). The distribution of dropout and turnover rates among urban and suburban high schools. *Sociology of Education*, *73*, 39 – 67

Stanton-Salazar, R. (1997). A social capital framework for understanding the socialization of racial minority children and youths. *Harvard educational review*, *67*(1), 1-41.

Swartz, D. (1977). Pierre Bourdieu: The cultural transmission of social inequality. *Harvard Educational Review*, *47*, 4545–4555.

Tanggaard, L. (2013). An exploration of students' own explanations about dropout in vocational education in a Danish context. *Journal of Vocational Education & Training*, *65*(3), 422-439.

Tas, A., Selvitopu, A., Bora, V., & Demirkaya, Y. (2013). Reasons for dropout for vocational high school students. *Educational Sciences, Theory and Practice*, *13*(3), 1561-1565

Thøgersen, M., Aadahl, M., Elsborg, P., & Klinker, C. D. (2020). Dropout at Danish vocational schools: does the school's health promotion capacity play a role? A survey-and register-based prospective study. *BMC Public Health, 20,* 1-11. https://doi.org/10.1186/s12889-020-08955-4

Thompson, D. F. (2008). Deliberative Democratic Theory and Empirical Political Science. *Annual Review of Political Science, 11*, 497-520.

Thorpe, H. (2009). Bourdieu, feminism and female physical culture: Gender reflexibility and the habitus-filed complex. *Sociology of Sports Journal*, *26*(1), 491-516.

Trainor, A. A. (2010). Reexamining the promise of parent participation in special education: An analysis of social and cultural capital. *Anthropology and Education Quarterly*, *41*(3), 245-263. https://doi.org/10.1111/j.1548-1492.2010.01086.x

Werblow, J., & Duesbery, L. (2009). The impact of high school size on math achievement and dropout rate. *The High School Journal*, *92*, 14 –23. https:// doi:10.1353/hsj.0.0022

Winship, C., & Korenman, S. D. (1999). Economic success and the evolution of schooling and mental ability. In: Mayer, S.E., Peterson, P.E. (Eds.), *Earning and Learning: How Schools Matter*, 49–78.

Yi, H. Zhang, L. Yao, Y. Wang, A. Ma, Y. Shi, Y. Chu, J., Loyalka, P., & Rozelle, S. (2015). Exploring the dropout rates and causes of dropout in upper-secondary technical and vocational education and training (TVET) schools in China, *International Journal of Educational Development*, *42*, 115-123

Yin, R. K. (1994). *Case Study Research: Design and Methods*, Sage

Ziomek-Daigle, J., & Cavin, J. (2015). Shaping youth and families through positive behavior support: A call for counselors. *The Family Journal*, *23*, 368–373.

International Journal of Contemporary Educational Research (IJCER)

www.ijcer.net

Do the scores obtained from online applications correspond to face-to-face exam scores?

İbrahim Yıldırım[1], Sevilay Çırak-Kurt[2]
[1]Gaziantep University, 0000-0002-4137-2025
[2]Adıyaman University, 0000-0001-8951-8727

Article History
Received: 04.03.2021
Received in revised form: 05.07.2021
Accepted: 01.12.2021
Article Type: Research Article

To cite this article:

Yıldırım, İ. & Çırak-Kurt, S. (2022). Do the scores obtained from online applications correspond to face-to-face exam scores? *International Journal of Contemporary Educational Research*, *9*(1), 18-27. https://doi.org/10.33200/ijcer.891326

International Journal of Contemporary Educational Research
Volume 9, Number 1, March 2022, Page 18-27 ISSN: 2148-3868

Do the scores obtained from online applications correspond to face-to-face exam scores?

İbrahim Yıldırım[1*], Sevilay Çırak-Kurt[2]
[1]Gaziantep University
[2]Adıyaman University

Abstract

The emergent Covid-19 pandemic in Wuhan, China, at the end of 2019 has affected the whole world in a short time. Therefore, schools have been closed worldwide, and online learning opportunities have been exploited. Although lessons are taught online, problems have been experienced about measuring and evaluating lessons. This quasi-experimental study with a quantitative method was conducted to offer suggestions for the measurement problems. The present study examined the relationship between the measures of academic achievement obtained through different approaches from the students studying at a university. According to the results, the achievement points earned by the students through weekly blogs had a high level of correlation with the traditional final scores. However, the scores of the practices such as online exams and term papers were not an acceptable fit with the final exams. Therefore, the scores of online missions extended over time can be claimed to be the approach that best substitutes the final exams.

Keywords: Assessment, Evaluation methodologies, Covid-19, Edmodo, Education

Introduction

The Covid-19 pandemic that emerged in Wuhan, China, soon affected the whole world at the end of 2019. The epidemic in China spread to Europe and other countries, especially the USA. Due to the virus's rapid spread, the World Health Organisation (WHO) declared Covid-19 a pandemic on the 12th of March, 2020 (WHO, 2020a). According to the Covid-19 data of the World Health Organisation, on the 21st of September, 2020, there were 30,949,804 confirmed cases worldwide and 959,116 reported deaths (WHO, 2020b). Turkey was eighth in the world by the maximum number of cases in the epidemic, causing devastating effects, especially in Europe. As stated by J. J. Rousseau, educational environments are in mutual interaction with social events. The Covid-19 pandemic has led to a shift in many social areas such as working conditions, transportation, daily life etc. it also has seriously affected education. These changes have inevitably revealed the necessity of reconsidering educational processes within the context of epidemic and technology. The Covid-19 pandemic has forced school closures in 191 countries, affecting at least 1.5 billion students and 63 million primary and secondary teachers (UN News, 2020). Furthermore, traditional education was interrupted or distance education was initiated at universities in many countries such as Italy, Germany, Finland, and Turkey. Additionally, several countries temporarily suspended academic facilities such as congresses and meetings (EDF, 2020). This transformation in educational environments paved the way for radical changes. It is possible to claim that the world was unprepared for this shift. To illustrate, despite distance education being initiated after school closures (including universities), as of the 16th of March in France, the Ministry of Education could not provide teachers with comprehensive digital resources to continue their classes. The students at public schools could not be taught for a month with the suspension of schools on the 20th of March in England even though private schools began to attend classes through video conferencing programs. Meanwhile, the BBC produced 14 weeks of course content aligned with the curriculum. In Spain, all the schools and universities were closed on the 14th of March. They were not supposed to be re-opened in the spring term (Yüzbaşıoğlu, 2020). During this period, school closures procrastinated for reaching the peak point in France for at least one month. They prevented the health sector accumulation from increasing further (Di Domenico et al., 2020). Assuming that the epidemic will continue for a while, it can be asserted that each component of educational environments with continuous face-to-face social interaction has to adapt to the inevitable shift.

* Corresponding Author: *İbrahim Yıldırım, iyildirim84@gmail.com*

Considering that educational environments are based on objectives, content, teaching process, and measurement and evaluation (Demirel, 2008), it is essential to reconsider them in distance education. It has succeeded in building the shift on a theoretical framework for teaching objectives, content, and teaching/learning situations quickly. Many institutions like UNESCO (2020) have offered suggestions and solutions in that vein. As the face-to-face teaching and learning process could not be continued, several ministries of education around the world used their online learning networks. In contrast, some others benefited from open source education platforms such as Moodle, Edmodo etc. Some private schools and universities have exploited online class applications such as Zoom, Webex, Teamlink, Microsoft teams, and Adobe connect for live lessons. The options mentioned above are different alternatives for the same purpose, and they are similar in terms of functionality. Therefore, no instability or serious problem has occurred concerning the means of distance education.

As can be understood, the educational institutions and decision-makers, who adapted for the lessons to be taught online quickly, have faced severe problems measuring and evaluating student achievements. The first emergent problem was about which way to follow. That is why face-to-face exams cannot be used during the Covid-19 period. In addition to the fact that measurement and evaluation are the feedback mechanism and the complementary components of the teaching environment, they must be handled carefully when considering their importance, as narrated in the following paragraph.

Timmis et al. (2016) stated that measurement and evaluation processes are more challenging while designing other variables in online learning is easier. To exemplify, it was declared by MoNE in Turkey that there would not be any measurement and evaluation, and no questions would be posed in the central exams for the content to be included within the scope of distance learning for K-12 schools (Sabuncu, 2020). Although online courses have been taught in many countries worldwide, written exams have been cancelled, suspended, postponed, or test formats have been changed (Sahu, 2020; Tedmem Report, 2020). The interruption of exams affects critical decisions such as students' continuation to the next grade or stage, certification, graduation, entrance to higher education, and entering the labour market. During the pandemic, how the students should be scored to pass to the next grade, how the transition between the stages will take place, whether the exams will be held or not, and whether the implementation of exams will be changed or not have distinguished as the issues to be decided urgently (Tedmem Report, 2020). Therefore, 280 senior medical school students at Imperial College London in the UK took "open book exams" online for the first time (Tapper, Batty, & Savage, 2020). In the USA, students entered Advanced Placement (AP) exams to gain the advantage of entering prestigious universities online this year due to the pandemic (AP, 2020). Different options such as online assignments, online quizzes, and projects have been put into action by the universities in Turkey. However, online exams have been seriously criticized in the relevant literature due to cheating (Watson & Sottile, 2010). On the other hand, assignments and projects have been blamed for not providing reliable results as a measuring instrument because the task can be performed by someone else and for creating an excessive burden on teachers (Griffin, 2014). In this case, the questions of which instruments to use in measurement and evaluation and how to make sure that they produce valid and reliable results constitute a significant problem. The present study is expected to contribute to the literature by offering suggestions for the above problems.

The purpose of this study was to reveal the relationship between the scores obtained through different measuring approaches within the scope of emergent question marks in terms of educational measurement and evaluation processes during the Covid-19 period. In this regard, the study's problem statement was identified to be "Can achievement scores obtained through different approaches be used instead of the traditional final exam scores?" The present study is significant in providing experimental evidence rather than personal opinions regarding the question "Is it reasonable to determine student achievement distantly?" which has been on the agenda since the beginning of 2020.

Method

This quasi-experimental quantitative study was designed with a single group post-test pattern (Akbay, 2019). The control group was not required as in-group variables were compared in the study. The participating students had a "Teaching Principles and Methods" course (2 hours per week, theoretically) as a part of their pre-service training over an academic term (14 weeks). At the same time, they ordinarily continued their education before the Covid-19 pandemic.

Experimental Process

In the quasi-experimental study conducted within the "Teaching Principles and Methods" course, the students received face-to-face education and entered the final exams ordinarily. However, no midterm exam was administered during the process. The data were collected from the students through Edmodo, an open-source learning management platform, within the context of out-of-class measuring approaches. During the experimental process, it was declared that students would write blogs, take quizzes, submit their term papers, and be informed about the course content via Edmodo. The students were enabled to use the Edmodo platform through the training at the very beginning of the semester. Throughout the teaching/learning process, the subject's content to be covered for the following week was delivered, and they had to take a quiz before the class. In other words, students were asked to take the quizzes without participating in the in-class learning processes after checking the course content. When the class was over, they wrote blogs about the lesson. In addition, students were also requested to hand in a term paper to be submitted via Edmodo. Student achievements were determined by using the results of all these measuring instruments together with the final exam.

Study Group

The study group consisted of the sophomores studying at the department of social sciences teaching in the faculty of education in a state university in southeast Turkey. Of the 30 students included in the study, 11 were male, and 19 were female. The students voluntarily participated in the study, continued their face-to-face education, and had the tools (computer, smartphone, internet connection, information about how to use Edmodo, etc.) needed for online applications to be used in measurement and evaluation.

Data Collection

The scores obtained from online blog writing, remote quizzes, and individual homework were collected in addition to the final exam scores within the scope of the study. The 0–100 scale was used to score student work with four different measuring approaches. The scores obtained by the students through the four approaches mentioned above had an impact on the final passing grades. Detailed information on the instruments was provided below.

Final Exam Scores

Within the scope of the study, an ordinary final exam was held under traditional conditions for the students. The face-to-face final exam was administered, as the experimental process was completed before the Covid-19 pandemic. The final exam consisted of two independent sections, and the final score was determined to be the sum of the scores obtained from those two exams. The first part of the exam was composed of 20 multiple-choice questions, and the validity and reliability studies were performed by Yıldırım (2016) for his doctoral dissertation. The test was graded over 50 points.

The second part of the exam consisted of three open-ended questions and scored over 50 points. The opinions of field experts and measurement and evaluation specialists were received while preparing the questions, and the rubrics were used to score. The questions in the exam were as follows:

> *Select one of the sample learning outcomes listed. When you consider the course process related to the learning outcome you have chosen assuming that you were a Social Studies Teacher;*
>
> - *How do you go about the teaching process? How do you use which method or technique? Why?*
> - *Indicate what high-level thinking skills will develop in your students with the method or technique you use.*
> - *Explain which teaching theories or approaches have traces on your teaching processes based on rationales.*

The exam papers were anonymously graded by the same rater three weeks apart based on the rubric, and similar results were achieved (r=.93, p<.01).

Scores from Weekly Blogs

Students were asked to write blogs on Edmodo every week. In the beginning, the whole class was informed about how to write blogs and criteria to evaluate their performance. A pilot blog was written and scored for the first week but was not included in the overall evaluation. This way, students were enabled to familiarise themselves with the process. Afterwards, the students were requested to write blogs about the course for 10

weeks. The blogs involved questions on the covered subject in a recent week. For example, the blog questions for a random week were as follows:

1. *What did you learn the best, what did you learn the least, why?*
2. *Which of the learning models in a recent week is practically better for you? Why?*
3. *How would you use the model you chose when you were a teacher? Can you explain with a classroom activity?*

The students were given five days for blog writing, and the blogs were scored over 10 points (over 100 points in total) by two distinct researchers every week. The researchers scored the blogs based on the rubric presented in Appendix 1. A high degree of agreement (r=.97, p<.01) was found between the scores of the two researchers. It can be appreciated as evidence of the reliability of the obtained data. The final blog scores of the students were estimated by the average scores of the two raters.

Quiz Scores

Remote quizzes were administered nine times in different weeks of the semester. In the first week, a pilot quiz was held to familiarize the students with the process, but the scores were not considered. The quizzes were prepared on Edmodo using multiple-choice, true-false, matching, short-answer or gap-filling question types. A minimum of 5 and a maximum of 13 questions were included in the exams. The students' mean scores from nine quizzes were converted to the 0-100 scale. The questions involved in the quizzes were prepared by the field expert considering the opinions of measurement and evaluation specialists and field experts. The content validity was tested to cover the relevant week, and the exams were held online through Edmodo. A one-minute duration was determined for each question in remote exams, and a single entrance was allowed for the quizzes (Figure 1).

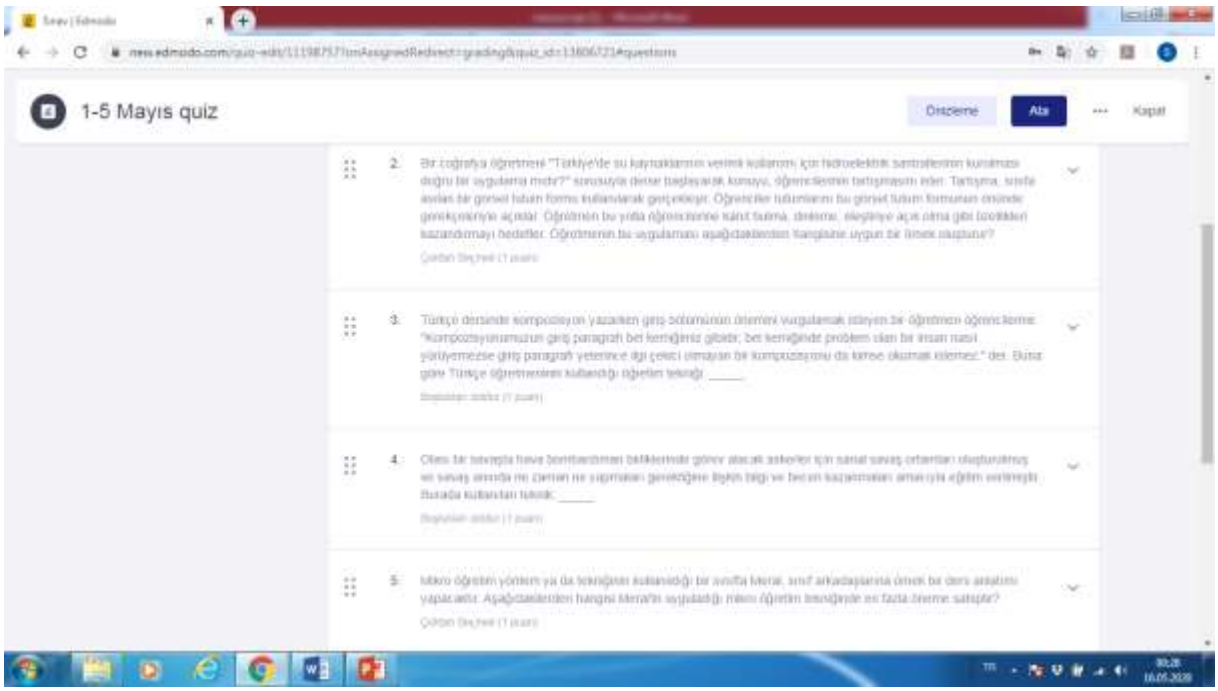


Figure 1. A screenshot of a quiz

Individual Homework Scores

A different subject title was assigned to each student as individual homework. For instance, while a student numbered 4 scrutinized Neurophysiological Learning Theory, another (numbered 23) searched the Constructivist Theory. The students were given six weeks to prepare their assignments with the instruction of *"Summarise the learning theory and model you have been assigned within the academic framework and explain that model in terms of the in-class use and relevant practices"*. The students submitted their homework before the final exam.

The assignments were scored two times by the same researcher over 100 points three weeks apart based on the holistic rubric presented in Appendix 2, and full alignment (r=1.00) was observed between the scores.

Data Analysis

As the present study included continuous data, the correlation coefficient was used to prove the relationship between the scores. Their differentiation from the mean of the final exam was scrutinised through a one-sample t-test. Research data collected through different approaches from the same study group were analysed by the IBM SPSS Statistics software package. The skewness and kurtosis were first examined to check for normality during the analysis process. Parametric tests were used as the values for final exam scores (skewness=-0.53, kurtosis=-1.08), blog scores (skewness=-0.27, kurtosis=-0.48), quiz scores (skewness=-0.24, kurtosis=-1.20), and homework (skewness=-0.79, kurtosis=0.38) were in the range between -2 and +2 as stated by George and Mallery (2003).

Results

Within the scope of the study, it will be useful to present the scores obtained by the students through different measuring techniques throughout the process before investigating the relationship between the scores. Therefore, the obtained scores are presented in Table 1.

Table 1. The obtained scores

Student	Final score	Blog score	Quiz score	Homework score
Student1	54	70.5	55.2	85
Student2	63	75.5	72.2	86
Student3	45	34.5	74.5	50
Student4	75	87	79.2	85
Student5	68	79	50.8	76
Student6	87	96.5	66.2	75
Student7	28	36.5	39.5	37
Student8	70	83	84.7	71
Student9	73	80.5	50	90
Student10	63	44.5	37.5	64
Student11	58	82.5	48.4	79
Student12	73	93	83.3	84
Student13	75	87	81.9	91
Student14	45	17	53.4	57
Student15	45	38.5	37.5	70
Student16	45	30	68.4	37
Student17	65	56	60.9	84
Student18	45	43	75	58
Student19	80	77.5	80.4	73
Student20	63	81.5	55.6	80
Student21	28	26	59.3	64
Student22	89	95	79.2	99
Student23	45	55	33.3	66
Student24	55	72	47.2	74
Student25	58	85.5	66.7	80
Student26	80	72	80.6	76
Student27	50	71.5	70.8	82
Student28	58	24	38.3	55
Student29	70	55	60	66
Student30	80	92.5	86.1	88

The chart for scores presented in the table is given in Figure 2.

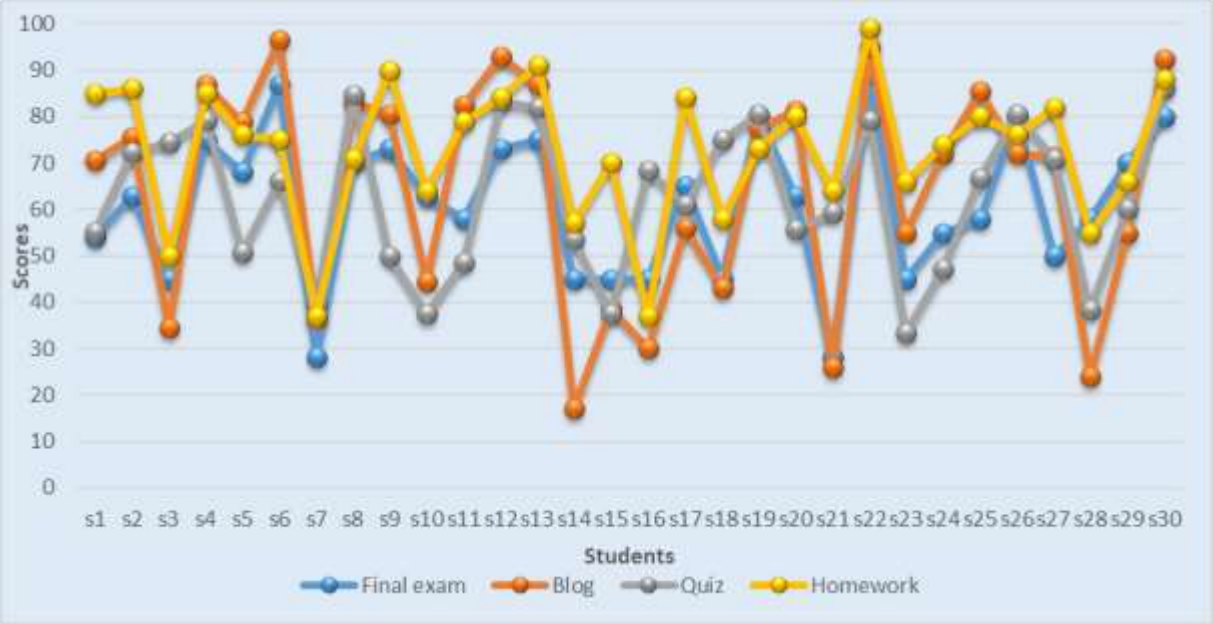


Figure 2. Score chart for all students

As shown in the table above, data were collected through different approaches from the study group. Descriptive statistics for the obtained achievement scores are presented in Table 2.

Table 2. Descriptive statistics for the scores

	N	Minimum	Maximum	Mean	Std. Deviation
Final score	30	28.00	89.00	61.10	15.98
Blog score	30	17.00	96.50	64.73	24.18
Quiz score	30	33.30	86.10	62.54	16.34
Homework score	30	37.00	99.00	72.73	15.14

Descriptive statistics for each type of score were given in Table 2. The examination of the scores yielded that the obtained scores did not widely differ, though a perfect fit could not be observed. It would be meaningful to determine whether other scores differed from 61.1, the mean of the final exams. According to the results of the one-sample t-test, it was revealed that there were no significant differences between the blog scores [$t(29)=0.82$, $p>.05$] and the quiz scores [$t(29)=0.48$, $p>.05$] with the mean of the final exams. However, homework scores [$t(29)=4.21$, $p<.05$] statistically differed from the mean of the final exams. Based on this, it can be claimed that the correlation coefficients to be obtained between blog writing and quiz scores with final scores would yield more precise results because there was no significant difference between these two scores. However, it was impossible to make a similar inference for the correlation of homework having significantly different means from the final exams. Hence, the correlation between two examinations with different means only indicates that they change together but do not imply the same/similar level of achievement.

The applicability of other exams instead of the final exam was tested within the scope of the study. In this regard, the relationship between the four exams was tested using the correlation coefficient (Table 3).

Table 3. Correlation between the scores

		Blog	Quiz	Homework
Final exam	Pearson Correlation	.774**	.514**	.683**
	Sig. (2-tailed)	.000	.004	.000
	n	30	30	30
Blog	Pearson Correlation		.492**	.812**
	Sig. (2-tailed)		.006	.000
	n		30	30
Quiz	Pearson Correlation			.362*
	Sig. (2-tailed)			.049
	n			30

According to Table 3, there was a positive, statistically significant, and relatively strong relationship between the final scores and those obtained from blog writing (r=.77, p<.01). There was a positive, statistically significant, and moderate relationship between the final exam and the quiz (r=.51, p<.01). However, there was a positive, statistically significant and moderate relationship between the final exam and homework (r=.68, p<.01). It would not be useful for grading achievements as they had different means based on the one-sample t-test results presented above. The acceptable fit limit of the scores obtained from the other instruments included in the study with the final exam scores was accepted to be .70 since it would be the reliability of the use of this data in a sense (Baumgartner & Chung, 2001). Therefore, it can be asserted that the final exam scores and blog scores were both compatible and related.

A positive, statistically significant, and moderate relationship between blog and quiz scores (r=.49, p<.01); a positive, statistically significant, and high level of relationship between blog and homework scores (r=.81, p<.01); a positive, statistically significant, and low level of relationship between quiz and homework scores were also found. Though they were not directly related to the main problem of the study.

Conclusion and Discussion

This quasi-experimental study examined the relationship between the measures of academic achievement obtained through different approaches from the students studying at university. The exploited measuring instruments and the obtained scores were explained, and reliability-validity studies were described in detail in the method section. According to the available results, students' achievement scores earned through writing weekly blogs correlated with the traditional final scores. In this regard, it can be alleged that the scores obtained from blog writing were the best substitutes for the final exam. On the other hand, a moderate relationship was determined between the scores obtained through online quizzes and the traditional final scores, which was below the acceptable level (.70). In addition, we revealed that homework scores had significantly different means from the final exam. They failed to offer a useful means since it would lead to a difference in grading achievement. The study was limited to being conducted in the faculty of education at a university and to the online practices through Edmodo.

The present study, using experimental data, aimed to find an answer to the discussion of measurement and evaluation, which has become the most controversial issue with the introduction of distance education during the Covid-19 pandemic. Based on the research results, giving students online tasks extended over time would produce more realistic results in cases where the traditional final exam cannot be held. Online exams are not useful in causing severe mistakes by unidentified variables such as cheating (Watson & Sottile, 2010). As stated in the literature (Ramu & Arivoli, 2012; Sarrayrih & Ilyas, 2013), online exams will only be available if high-level security precautions such as face recognition can be taken. However, in that case, a problem arises regarding the security of private information. Assigning homework jeopardises content validity (Cohen et al., 2005) as it will exclusively focus on a particular subject. Overgeneral homework, on the other hand, will not be useful in terms of effort. Moreover, as mentioned in the introduction part of the study, it can be asserted that homework cannot yield reliable results as a measuring instrument since it can be developed by someone else (Griffin, 2014). Pritchard and Warnakulasooriya (2005) concluded that online homework and practices provided with the Socrative platform could substitute the final exams with a .63 correlation. In this regard, *online tasks extended over time* can be considered the best alternatives to be used instead of the final exams both in terms of validity and reliability and in better agreement with the final exams currently in practice. Herein, online tasks must be designed to explain the context with their own thoughts from their perspective and offer suggestions beyond presenting a basic level of knowledge. Online tasks in our study were the assignments to be enriched with authentic and applicable examples of the students' own.

The introduction of online options raises an additional problem situation about the competencies of academicians and students in using those alternatives. Raaheim et al. (2019) asserted that academicians have little awareness of alternative online measuring instruments, even with a high-quality education in Norway. Kearns (2012), on the other hand, pointed out that students' experience problems in adapting to remote measuring procedures. It reveals that academicians and students are not ready for the shift. Therefore, it can be inferred that these alternative online measuring instruments should be employed upon furnishing the academicians and students with necessary qualifications. On the other hand, larger study groups and research at different levels of education are needed considering the present study was limited to a group of 30 university students. It can be alleged that such studies will substantially contribute to the literature, most particularly in the recent period. In addition, it can be stated that the research results can be used in the measurement processes carried out at the undergraduate level in the context of distance education.

Acknowledgements or Notes
The datasets used and analyzed during the current study are available in the article.

Author (s) Contribution Rate
The authors contributed equally to the study.

Conflicts of Interest
No potential conflict of interest was reported by the authors.

References

Akbay, T. (2019). Deneysel Araştırmalar. In S. Şen & İ. Yıldırım (Eds), *Eğitimde araştırma yöntemleri.* Ankara: Nobel Publications.

AP (2020). *Updates for AP Students Affected by Coronavirus (COVID-19).* Retrieved from https://apcoronavirusupdates.collegeboard.org/students

Baumgartner, T. A., & Chung, H. (2001). Confidence limits for intraclass reliability coefficients. *Measurement in Physical Education and Exercise Science, 5*(3), 179-188.

Cohen, L., Manion, L., & Morrison, K. (2005). *Research methods in education.* London: Routledge.

Demirel Ö. (2008). *Kuramdan uygulamaya eğitimde program geliştirme. (11th Ed.).* Ankara: Pegem Akademi.

Di Domenico, L., Pullano, G., Coletti, P., Hens, N., & Colizza, V. (2020). Expected impact of school closure and telework to mitigate COVID-19 epidemic in France. *Report 8, EPIcxlab.*

EDF (Economic Development Forum) (2020). AB üyesi ülkelerin covid-19 tablosu: mevcut durum ve alınan önlemler. Retrieved from https://www.ikv.org.tr/ikv.asp?ust_id=3631&id=3766

George, D., & Mallery, M. (2003). *SPSS for Windows Step by Step: A Simple Guide and Reference*, 11.0 update (4th ed.) Boston: Pearson.

Griffin, C. (2014). Transition from brick and mortar to online teaching: middle-grade teachers' perspectives. *Electronic Theses and Dissertations.* 1112. Retrieved from https://digitalcommons.georgiasouthern.edu/etd/1112

Kearns, L. R. (2012). Student assessment in online learning: Challenges and effective practices. *Journal of Online Learning and Teaching, 8*(3), 198-208.

Pritchard, D. & Warnakulasooriya, R. (2005). Data from a Web-based Homework Tutor can predict Student's Final Exam Score. In P. Kommers & G. Richards (Eds.), *Proceedings of ED-MEDIA 2005-World Conference on Educational Multimedia, Hypermedia & Telecommunications* (pp. 2523-2529). Montreal, Canada.

Raaheim, A., Mathiassen, K., Moen, V., Lona, I., Gynnild, V., Bunæs, B. R., & Hasle, E. T. (2019). Digital assessment–how does it challenge local practices and national law? A Norwegian case study. *European Journal of Higher Education, 9*(2), 219-231.

Sabuncu, T. (2020, March 18). Ziya Selçuk: Uzaktan eğitim ile alınan konular sınava dahil olmayacak. Retrieved from https://www.haber.com/ziya-selcuk-uzaktan-egitim-ile-alinan-konular-sinava-dahil-olmayacak-280041/

Sahu, P. (2020) Closure of Universities Due to Coronavirus Disease 2019 (COVID-19): Impact on Education and Mental Health of Students and Academic Staff. *Cureus 12*(4): e7541.

Sarrayrih, M. A., & Ilyas, M. (2013). Challenges of online exam, performances and problems for online university exam. *International Journal of Computer Science Issues (IJCSI), 10*(1), 439.

Tapper, J., Batty, D., & Savage, M. (2020). Medical students take final exams online for first time, despite student concern. Retrieved from https://www.theguardian.com/education/2020/mar/22/coronavirus-forces-medical-students-sit-final-exams-online

Tedmem Report (2020). COVID-19 Salgını ve Sınavlar. Retrieved from https://tedmem.org/covid-19/covid-19-salgini-ve-sinavlar

Timmis, S., Broadfoot, P., Sutherland, R., & Oldfield, A. (2016). Rethinking assessment in a digital age: Opportunities, challenges and risks. *British Educational Research Journal, 42*(3), 454-476.

UN News (2020, April 21). Startling disparities in digital learning emerge as COVID-19 spreads: UN education agency. Retrieved from https://news.un.org/en/story/2020/04/1062232

UNESCO (2020). More on UNESCO's Covid-19 education response. Retrieved from https://en.unesco.org/covid19/educationresponse/solutions

Watson, G. R., & Sottile, J. (2010). Cheating in the digital age: Do students cheat more in online courses? *Online Journal of Distance Learning Administration 13*(1), 1-13.

WHO (2020a). Coronavirus disease 2019 (COVID-19) Situation Report – 51, Retrieved from https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200311-sitrep-51-covid-19.pdf?sfvrsn=1ba62e57_10

WHO (2020b). WHO Coronavirus Disease (COVID-19) Dashboard. Retrieved from https://covid19.who.int/

Yıldırım, İ. (2016). *Development, implementation and evaluation of a gamification based curriculum for the lesson of "teaching principles and methods" (Unpublished doctoral dissertation).* Department of Educational Sciences, Gaziantep University, Turkey

Yüzbaşıoğlu (2020, April 22). Kovid-19 salgını dünya genelinde uzaktan ve sanal eğitimi zorunlu kıldı. Retrieved from https://www.aa.com.tr/tr/egitim/kovid-19-salgini-dunya-genelinde-uzaktan-ve-sanal-egitimi-zorunlu-kildi/1814237

Appendix 1. Rubric used when scoring blogs

Criteria	**Score**
The questions were answered by heart superficially, the reasons were not explained, or only one of the questions was answered. Practical suggestions were not offered and sampling was unavailable.	Poor (0-3)
The questions were answered partially or entirely with the explanation of reasons. Practical suggestions and examples were offered without depth.	Moderate (4-6)
The questions were answered in such a way as to explain the reasons. Practical suggestions and examples were included realistically.	Good (7-10)

Appendix 2. Rubric used when scoring homework

Criteria	**Score**
Some features of the theory or model were superficially summarized in book sentences. There were no explanations about the reflection of the theory or model in classroom practices.	Poor (0-25)
The characteristics of the theory or model were summarized in book sentences. Superficial explanations were included about the reflections of the specific features of the theory or model in classroom practices.	Moderate (26-50)
Most of the important details of the theory or model were summarized in student's own sentences. Explanations were included about the reflections of the specific features of the theory or model in classroom practices.	Good (51-75)
Every important detail of the theory or model was summarized in student's own sentences. Deep and enriched explanations with examples were included about the reflections of the specific features of the theory or model in classroom practices.	Exceptional (76-100)

Article History
Received: 11.04.2021
Received in revised form: 20.09.2021
Accepted: 01.12.2021
Article Type: Research Article

International Journal of Contemporary Educational Research (IJCER)

www.ijcer.net

The Effect of Simulation-Based Experiential Learning Applications on Problem Solving Skills in Social Studies Education

Ceyhun Uzun[1], Kamil Uygun[2]
[1] Republic of Turkey Ministry of National Education, 0000-0002-5002-4508
[2]Usak University, 0000-0002-8971-328X

To cite this article:

Uzun, C. & Uygun, K. (2022). The effect of simulation-based experiential learning applications on problem solving skills in social studies education. *International Journal of Contemporary Educational Research*, *9*(1), 28-38. https://doi.org/10.33200/ijcer.913068

International Journal of Contemporary Educational Research
Volume 9, Number 1, March 2022, Page 28-38 ISSN: 2148-3868

The Effect of Simulation-Based Experiential Learning Applications on Problem Solving Skills in Social Studies Education*

Ceyhun Uzun[1], Kamil Uygun[2]**
[1]Republic of Turkey Ministry of National Education
[2]Usak University

Abstract

The study aims to reveal the effect of simulation-based experiential learning applications on gaining problem-solving skills in the Social Studies curriculum. The research was carried out in an experimental model, and the data were obtained according to the controlled pre-test and post-test approach. Social process simulation, as a type of social simulation, was preferred during the application process.Three new and originally developed social process simulations were used in the context of the simulation-based experiential learning applications for the learning theme of "Power, Management and Society" in the 7th grade social studies curriculum. According to the time prescribed in the program, the course implementation continued for 4 weeks (12 lessons) in total. The research was carried out in Usak's Karahallı District Cumhuriyet Secondary School. The research study group composed of 42 students; 21 students in the experimental group and 21 students in the control group participated in the research. The "Problem Solving Skills Scale" consisting of 4 dimensions was used as the research data collection tool. Mann Whitney U Test and Wilcoxon Signed Ranks Test as non-parametric tests were used to analyze the data obtained in the study. According to research results, the post-test results of the experimental group students who were educated in the simulation-based experiential learning model were significantly higher than the control group students who were educated with the methods prescribed in the programme. In conclusion, in this context, it has been reached that simulation-based experiential learning applications enhance students' problem-solving skills.

Keywords: Experiential learning, Simulation-based learning, Social studies education, Problem-solving skills

Introduction

Many methods have been tried and applied in Social Studies Education. Due to the nature of Social Studies, many techniques can be applied and tested. According to the research conducted by Akçay, Akçay, and Kurt (2016), Social Studies teachers stated that they used the direct expression technique with 83%, the question-answer technique with 57%, and the homework technique with 54%. However, according to the personal qualifications required by the new era, such as lifelong learning skills, knowledge transfer to real cases, open-minded thinking skills are not possible to be acquired by using traditional learning methods (Çelikkaya & Kuş, 2009). Koç (2013) stated that teaching with traditional methods in Social Studies education is insufficient to gain skills such as creative thinking and problem-solving, which are included in general social studies. He states that new learning approaches that bring different perspectives to the learning and teaching process should be utilized to acquire such recent and important skills. For effective learning, the knowledge should be structured by the learner themselves learning by doing via problem analyzing and generating creative solutions to problems (Çiftçi, 2006). There are two domains in social studies education: teacher and knowledge transfer based teaching and the second is student and learning inquiry based teaching. Usually, such methods like discussion, role-playing, problem-based learning, etc. have been used in the student-centred domain (Wanzek, Kent, Vaughn, Swanson, Roberts & Haynes, 2015; Beck & Eno, 2012).

* This article was produced from the PhD Thesis titled *"Designing, implementation and investigation of simulation based experiential learning applications in social studies education"* accepted within the Social Studies Education Doctorate Programme of Usak University Institute of Social Sciences.

** Corresponding Author: *Kamil Uygun, kamil.uygun@usak.edu.tr*

Kan (2006), recommends using new-age recent methods in social studies education. In Social Studies education, when students actively participate in the lessons, they will observe the world, discover more, gain new experiences and transfer their knowledge to their daily life (Çelikkaya, 2014). Kumar and Lightner (2007) state that non-traditional methods such as games, simulations, interactive activities, and teaching based on digital learning are more valuable. However, Ruben (1999) also states that experiential learning and simulation-based education create more complex and diverse learning outcomes and encourage active learning, collaboration, and interaction. Tomlinson and Masuhara (2009) state that using games in education gives rapid real-time feedback and increases learning effectiveness regardless of discipline. Göncüoğlu (2010: 16) classified the methods commonly used in Social Studies education as teacher-oriented, interaction-oriented, individual-oriented, and life-oriented.

Experiential learning model focuses directly on experience much more than other life-oriented learning models. Experiential learning theory was developed according to the ideas of educators such as Jean Piaget, John Dewey, Lev Vygotski, Paulo Freire, Carl Jung, Kurt Lewin, Carl Rogers, and William James, who were among the pioneers of the movement that shaped the 20th century and focused on human development and learning. The theory has the following six principles (Passarelli & Kolb, 2011: 4-5):

1. Learning is not an outcome; it is a process.
2. All learning is re-learning of the existing.
3. Learning requires resolving the contrasts in the adaptation process to the world.
4. Learning is a holistic adaptation process.
5. Learning occurs as a result of synergetic interaction between the environment and humans.
6. Learning is the process of creating and revealing knowledge and experience.

Experiential learning theory defines learning as the process of transforming experiences into knowledge; however, it defines knowledge as the combination of understanding and transforming experience (Kolb, 2015: 49-51). Experiential learning is schematized with a cycle with 4 phases. These 4 phases are respectively;

Concrete Experience > Reflective Observation > Abstract Conceptualisation > Active Experimentation

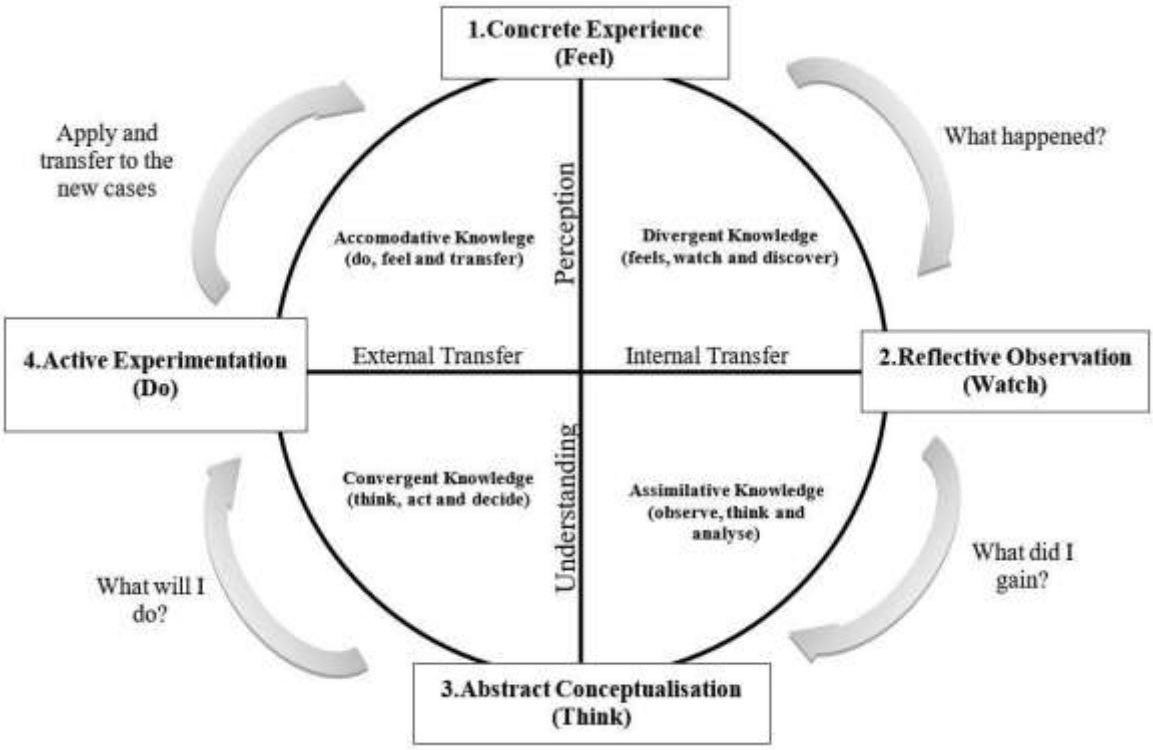


Figure 1. David Kolb's Learning Styles Model and Experiential Learning Theory

Many methods and techniques are used while designing learning experiences in the experiential learning model. One of the essential methods is educational simulations in the experiential learning theory. Simulations are not

excellent theoric and non-practical methods; conversely, it accommodates the practicality to the centre of learning; hence this situation transforms simulations into a learning tool that practically integrates complex skills required in real life (Hofstede, Caluwe & Peters, 2010). Simulated experiential environments are learning environments in which life-like fiction are created to reveal real-world-like reactions of participants in simulations (Keys & Wolfe, 1990). In addition, simulations are an educational method-technique that offers opportunities to experience a range of skill sets in dealing with future situations (Fowler & Pusch, 2010). Simulations are basically divided into three categories, and a detailed classification is presented below:

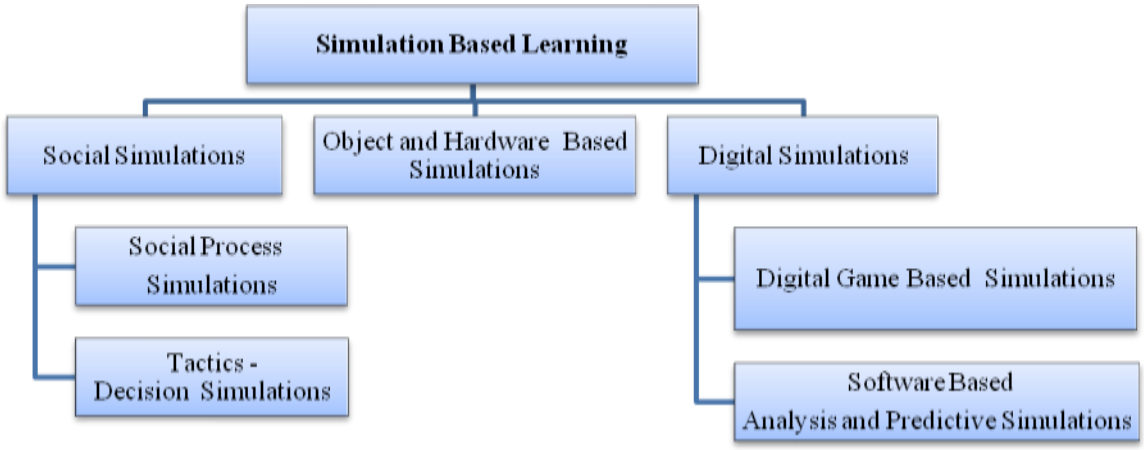


Figure 2. Simulation-Based Learning and Its Classification

Simulation-based education is a very proper method and technique for Social Studies education. Nemerow (1996) stated that playing social games in the classroom does not solve all the education problems, but it is a very effective method to include students in their learning processes. The simulation type used and developed within this research scope falls into the type of social process simulations. Social process simulations focus on human interaction and communication in developing social skills (Raybourn, 2006). Besides, Shubik (2009) states that simulation-based learning has many application areas and performs the following functions and objectives:

1. Increasing the learning motivation
2. Strengthening and encouraging the use of other methods in education
3. Teaching the theories with why, how, and their relationship
4. Making sense and creating meaningful relations between dynamic situations and learning
5. Developing and teaching interpersonal relationships
6. Contributing to the acculturation process of children
7. Acquiring various skills (academic skills, vital skills, etc.).

Social Studies education prioritizes skill-based learning, directly impacting learners' social life and increasing individual competencies with real elements in life. In this context, a severe effect will be made by using simulation games to provide students with many complex skills and values in skill-based education under the Social Studies discipline. Occasionally, it will be possible to teach abstract social issues to students in a deeply applied manner via social simulations. On the other hand, problem-solving skills, one of the most essential skills in 21'st century, also stand on a crucial point in the Social Studies programme. With this study, a practical and concrete application was made on how to increase students' problem-solving skills with the method of social process simulations. The study aims to reveal the effect of simulation-based experiential learning applications on gaining problem-solving skills in the Social Studies curriculum.

Method

Research Design

The research was designed in an experimental model with a controlled Pretest and post-test design. The experimental model is data acquisition by considering cause-effect relationships under the researcher's control to obtain data on a research subject (Fraenkel, Wallen & Hyun 2011: 265-266). Experimental models, that is, the experimental group and the control group, have two sub-patterns: A) Controlled posttest pattern, B)

Controlled pretest and posttest pattern; in this context, the research was developed in the design "Controlled pretest and posttest"..
In scientific studies, the research should be carried out according to certain process steps to obtain the most reliable and accurate findings suitable for the research purposes (Katılmış, 2010: 154). In this context, after designing the simulation and learning activities in the research, a seminar was held for the students and school administrators to present the experimental work and its steps. In a part of the seminar, the scales to be pre-tested by the researcher were applied to the experimental and control groups. Later, after four weeks of application, the scale was applied again as Post-test to the groups.

The research was completed following the rules of publication ethics. Ethical approval was obtained from Usak University Scientific Research and Publication Ethics Committee. (2021/11)

Sample

The study was implemented in Cumhuriyet Secondary School 7/A and 7/B classes in Usak Province, Karahallı District. Class 7/B is the experimental group, and Class 7/A forms the control group. The research study groupresearch study group consists of 42 students; 21 students in the experimental group and 21 students in the control group participated in the research.

Data Collection Tools

The *Problem Skills Inventory* for primary school students used in the study was developed by Bulut, Bulut Serin and Saygılı (2010), and permission for usage was obtained. The scale consists of 24 items and 3 sub-dimensions, and it was formed as 5-point Likert-type answers. In an experimental study, the relationship between dependent and independent variables is examined systematically and empirically; the independent variables that affect or will affect the result are manipulated (controlled) by the researcher and the changes are determined (Akkoyun, 1986: 295). From this point of view, three original simulations and new experiential learning activities designed by the researcher related to the 7th grade "Power, Management and Society" learning area were applied to the experimental group. In the control group, the lesson was taught with the method prescribed in the program.

Implementation lasted 5 weeks and 13 classes . First week there was introduction session took 1 class which was about the work process and pre-test collected from participants. In the following four weeks and 12 lessons, the researcher implemented 3 simulations and experiential learning activities and post-test data collected at the end of the whole lessons. Experiential learning activities comprised warm-up games, energisers, ice-breakers, team building activities, group division games, exercises etc. According to the Kolb's Learning Cycle, simulations started with "Concrete Experience" phase and case&scenario given, roles distributed, main activity held. In the second phase "Reflective Observation" pax discussed what happened, their feelings, their emotions and de-brief their thoughts about the learning objective and its relation together; feedbacks delivered by the facilitator. In the third phase "Abstract Conceptualisation", the researcher (facilitator) mentioned the lesson notes delivered before the session and formal informations given about the main subject and learning experiences linked with concrete actions in the former episode. Within the fourth phase "Active Experimentation" the learning transfer sheet was distributed to the pax. They imagined how they transfer their whole learning journey and its outputs to real-life cases.

Data Analysis

In analyzing the data, the necessity of applying non-parametric tests arose since each experimental group and the control group was under 30 people. In cases where the data cannot meet the assumptions and conditions in parametric tests and in the absence of normal distribution, it is necessary to use non-parametric tests (Karagöz, 2010: 18-19). As a parametric domain, the dependent samples t-test helps measure the attitude scores, anxiety levels, etc., of a group before and after the implementation. Non-parametric equivalent of dependent samples t-test is Wilcoxon Signed Ranks Test (Büyüköztürk, Çokluk & Köklü, 2013: 154-211). In the study, the non-parametric tests Wilcoxon t-test (Wilcoxon Signed Ranks Test) analysis was conducted to evaluate the change within the groups and among the groups before and after the application.

Within this research scope, the pre-test - post-test results of the study group were examined; whether there was a significant difference within the group and between groups was statistically analyzed. Differences between two independent groups (experimental and control group) were analyzed using the Mann Whitney U Test (U). The differences between the two dependent variables (problem-solving skills pre-test and post-test scale scores)

before and after the application were controlled by Wilcoxon Signed Ranks Test (Z) analysis. Analyzes were completed at 0.05 significance and 95% confidence level.

Findings

There are 2 main problems in the research:

P1: Is there a significant difference between the experimental group where the simulation-based experiential learning approach was applied and the control group's problem-solving skills pre-test and post-test mean scores?

Table 1. Examination of the problem-solving skills between groups scores in simulation-based learning

Scale	Test	Group	$\bar{X}$	ss	Median (Min.-Max.)	U	*p*
Confidence dimension in problem solving skills	Pretest	Experiment	37,43	9,24	37(17-57)	-3,400	0,001*
		Control	46,29	5,45	46(36-57)		
	Posttest	Experiment	44,48	9,48	47(25-57)	-0,315	0,753
		Control	45,67	9,11	47(32-60)		
Self-control dimension in problem solving skills	Pretest	Experiment	21,95	6,14	24(14-32)	-1,653	0,098
		Control	25,24	5,66	26(14-34)		
	Posttest	Experiment	23,05	5,91	25(12-32)	-1,172	0,241
		Control	25,19	6,31	26(11-34)		
Avoidance dimension in problem solving skills	Pretest	Experiment	17,62	4,54	18(9-24)	-2,203	0,028*
		Control	20,71	2,72	21(15-25)		
	Posttest	Experiment	18,86	4,32	20(10-25)	-0,101	0,919
		Control	18,9	4,67	19(8-25)		
Problem solving skills overall total	Pretest	Experiment	77,0	13,45	74(58-108)	-0,629	0,529
		Control	92,24	10,92	94(74-114)		
	Posttest	Experiment	86,38	13,41	85(63-111)	-3,588	0,000*
		Control	89,76	15,44	87(66-118)		

U: Mann Whitney U Test (Intergroup comparisons)
*: $p<0,05$ (Statistically significant)

Examining Table 1, the result of the Mann Whitney between-groups U analysis is a statistically significant difference between the control and experimental groups' scores on the pretest of the "confidence in problem-solving skills" dimension, the pretest of the "avoidance" dimension, and the posttest of the "problem-solving skills" totality [U= -3.400, U= -2.203, U= -3.588; $p < 0.05$].Accordingly, the pre-test scores of *"Confidence in Problem Solving Skills"* dimension, the pre-test of *"Avoidance"* dimension, and the post-test of *"Problem Solving Skills"* scale of the control group were significantly higher than the experimental group. As a result of the Mann Whitney U analysis applied, there is no statistically significant difference between the control and experimental groups post-test of *"Confidence in Problem Solving Skills*" dimension, the pre-test and post-test of *"Self Control"* dimension, the post-test of *"Avoidance"* dimension and the pre-test *"Problem Solving Skills"* scale general scores [U= -0.315, U= -1.653, U= -1.172, U= -0.101, U= -0.629; $p> 0.05$].

Also, when Table 1 is examined, the result of the Mann Whitney U analysis applied is that there is no statistically significant difference between the experimental group, in which the simulation-based experiential learning approach was used, and the control group, in which the instruction provided in the programme was used, in terms of overall pretest problem-solving skills mean scores [U= -0.629; $p > 0.05$].There is a statistically significant difference between the experimental group, in which the simulation-based experiential learning approach was used, and the control group, in which the instruction provided in the programme was used, in terms of the mean score of the post-test problem-solving skills [U= -3.588; $p < 0.05$].From this point of view, it was found that simulation-based experiential learning applications improve students' problem-solving skills.
P2: Is there a significant difference between the in-group problem-solving skills pre-test and post-test mean scores of the experimental group. The simulation-based experiential learning approach was applied and the control group?

Table 2. Examination of problem-solving skills in group pret-est and post-test mean scores in simulation-based learning

Scale	Group	Test	X̄	ss	Median (Min.-Max.)	Z	*p*
Confidence in problem solving skills	Experiment	Pretest	37,43	9,24	37(17-57)	-3,309	0,001*
		Posttest	44,48	9,48	47(25-57)		
	Control	Pretest	46,29	5,45	46(36-57)	-0,323	0,747
		Posttest	45,67	9,11	47(32-60)		
Self-control in problem solving skills	Experiment	Pretest	21,95	6,14	24(14-32)	-0,829	0,407
		Posttest	23,05	5,91	25(12-32)		
	Control	Pretest	25,24	5,66	26(14-34)	-0,061	0,951
		Posttest	25,19	6,31	26(11-34)		
Avoidance in problem solving skills	Experiment	Pretest	17,62	4,54	18(9-24)	-1,267	0,205
		Posttest	18,86	4,32	20(10-25)		
	Control	Pretest	20,71	2,72	21(15-25)	-1,935	0,053
		Posttest	18,9	4,67	19(8-25)		
Problem solving skills overall total	Experiment	Pretest	77,0	13,45	74(58-108)	-4,017	0,000*
		Posttest	86,38	13,41	85(63-111)		
	Control	Pretest	92,24	10,92	94(74-114)	-1,159	0,246
		Posttest	89,76	15,44	87(66-118)		

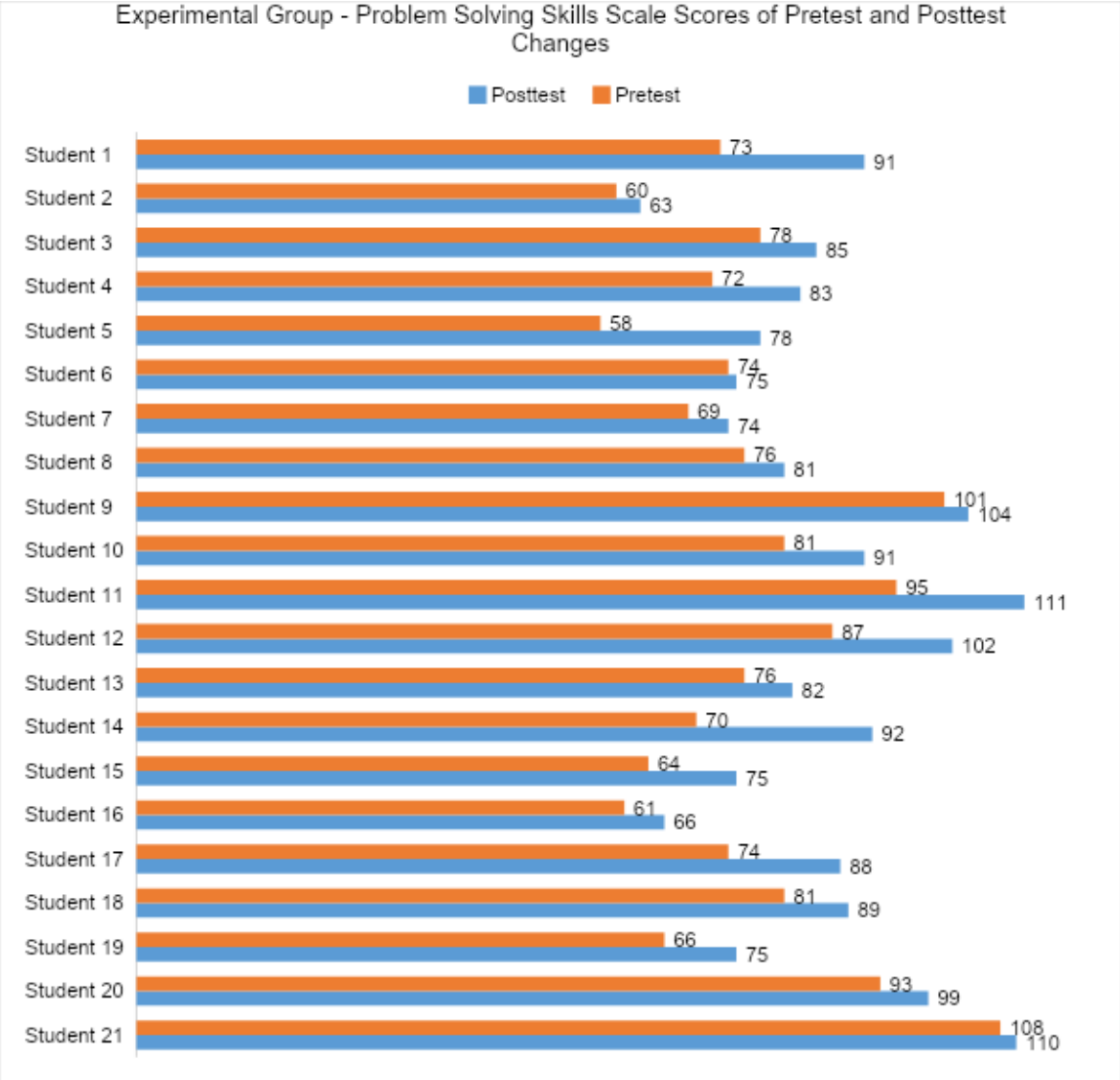
Z: Wilcoxon Test (Comparisons before and after training in-group)
*: $p<0,05$ (Statistically significant)

When Table 2 is investigated, the average scores of the experimental group's pre-test *"Trust in Problem Solving Skills"* dimension is 37.43, while the average of the post-test scores from the same dimension is 44.48. The pre-test of *"Self-Control"* dimension scores of the experimental group was-21.95, while the post-test scores from the same dimension were at the level of 23.05. The experimental group's pre-test "Avoidance" dimension scores were 17.62, while the post-test scores from the same dimension were at the level of 18.86. While the general scores of the experimental group's pre-test "Problem Solving Skills" scale were 77, the post-test general scores from the same scale were at the level of 86.38. As a result of the applied Wilcoxon analysis, the pre-test and post-test *"Confidence in Problem Solving Skills"* dimension and the *"Problem Solving Skills"* scale pre-test and post-test general scores of the experimental group showed a statistically significant difference [Z= -3,309, Z= -4,017; $p<0.05$]. Accordingly, the post-test "*Confidence in Problem Solving Skills"* dimension and the post-test *"Problem Solving Skills"* scale general scores of the experimental group students were significantly higher than the pre-test. Pretest and posttest *"Self Control"* dimension and *"Avoidance"* dimension scores of the experimental group do not show a statistically significant difference [Z= -0,829, Z= -1,267; $p> 0.05$].

While the mean scores of the control group's pre-test "Trust in Problem Solving Skills" dimension were 46.29, the average of the post-test scores from the same dimension was 45.67. The control group's pretest scores for the self-control dimension were 25.24, while the posttest scores for the same dimension were 25.19. The control group's pre-test scores for the Avoidance dimension were 20.71, while the post-test scores for the same dimension were 18.9. While the pre-test general score of the problem solving skills scale of the control group was 92.24, the post-test general score of the same scale was 89.76.As a result of the applied Wilcoxon analysis, the general scores of the pre-test and post-test *"Confidence in Problem Solving Skills"* dimension, *"Self-Control"* dimension, *"Avoidance"* dimension, and *"Problem Solving Skills"* scale within the control group did not show statistically significant difference [Z= -0.323, Z= -0.061, Z= -1.935, Z= -1.159; $p> 0.05$].

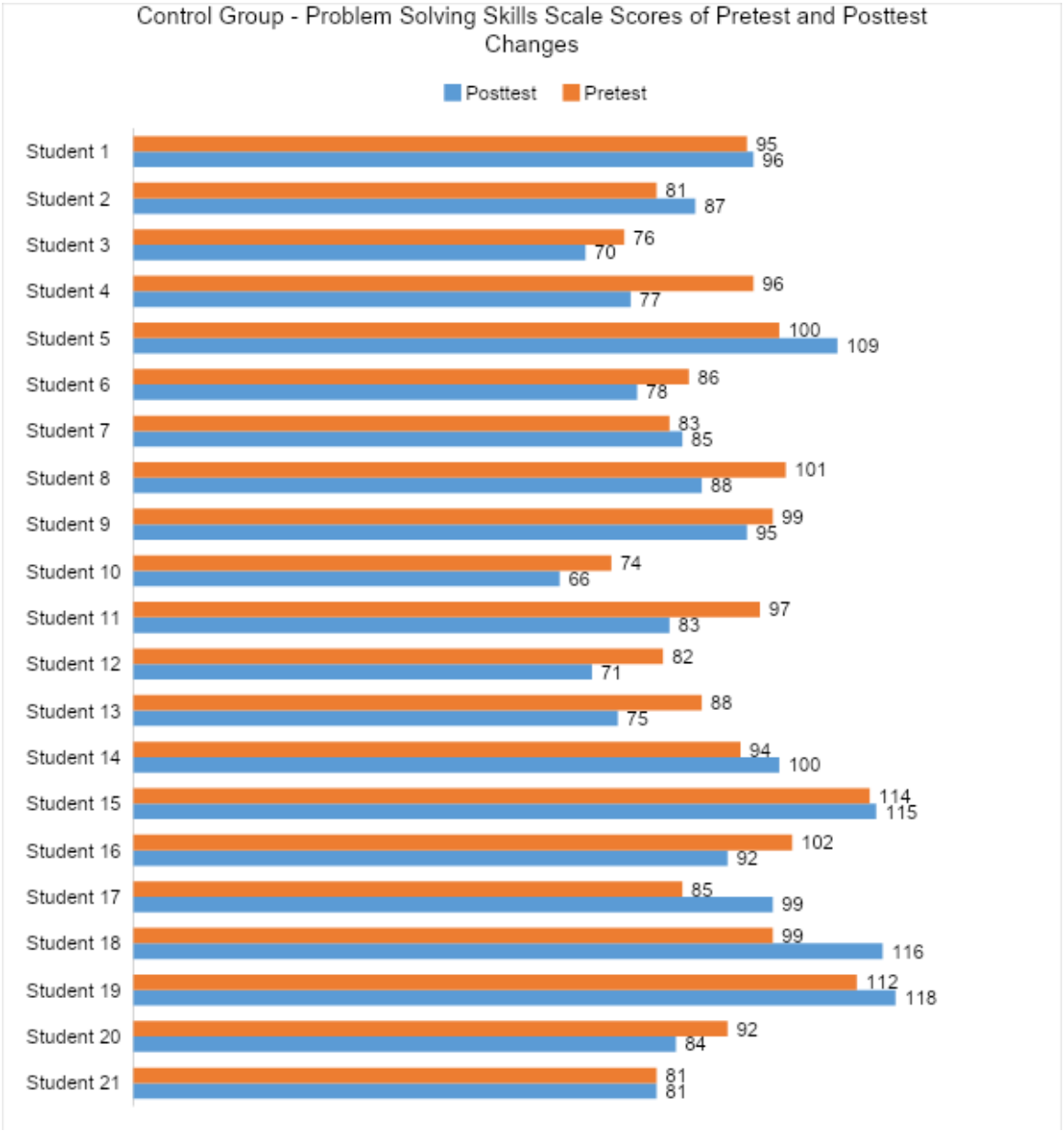
Also, when Table 2 is examined, the result of the Wilcoxon analysis applied is that there is a significant difference between the pre-test and post-test mean scores of problem solving skills in the experimental group in which the simulation-based experiential learning approach was used [p=0.000].For this reason, the second problem was accepted as there is a significant difference for the experimental group. There is no significant difference between the mean scores of pre-test problem-solving skills and post-test problem-solving skills of the control group. The instruction prescribed in the program was applied [$p> 0.05$]; therefore, problem 2 was accepted as no significant difference for the control group.

Each student was assigned a nickname number during the data collection phase of the study. Pre- and posttests were conducted to ensure that these numbers matched the students.Thus, it was possible to observe the process of students between pre-test and post-test. These changes are graphed on student and group basis and presented below.



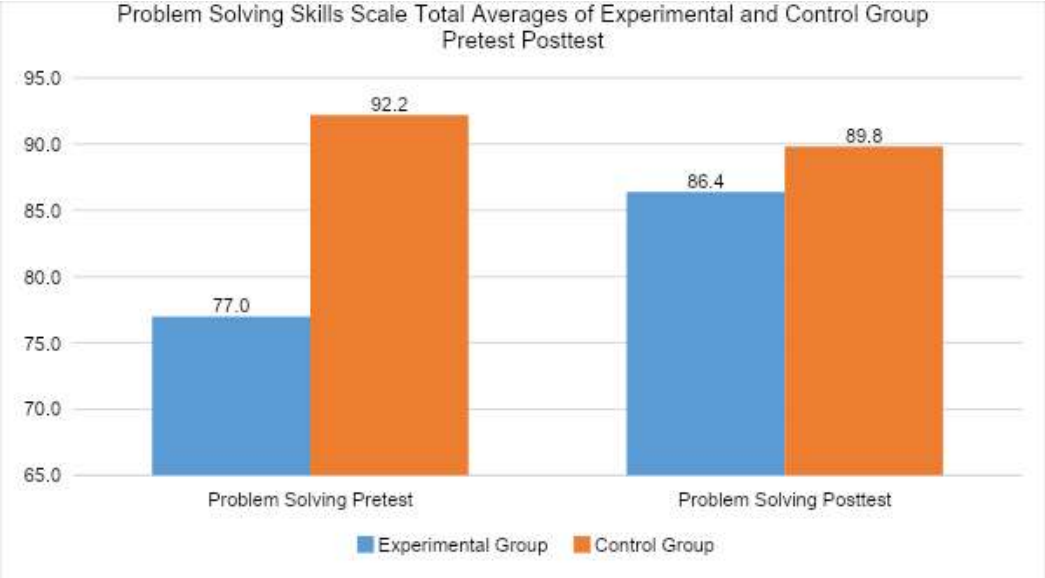
Graphic 1. Experimental group - problem solving skills scale scores of pretest and posttest changes

According to Graphic 1, the Problem-Solving Skills of the experimental group students after the simulation-based experiential learning application according to the change in the Pretest and Posttest averages, 1'st Student 18%, 2'nd Student 3%, 3'rd Student 7%, 4'th Student 11%, 5'th Student 20%, 6'th Student 1%, 7'th Student 5%, 8'th Student 5%, 9'th Student 3%, 10'th Student 10%, 11'th Student 16%, 12'th Student 15%, 13'th Student 6%, 14th student 22%, 15'th student 11%, 16'th student 5%, 17'th student 14%, 18'th student 8%, 19'th student 9%, 20'th student 6% and 21'st student 2% has achieved a positive increase in solving skills.



Graphic 2. Control group - problem-solving skills scale scores of pre-test and post-test changes

According to Graphic 2, the Problem Solving Skills of the control group students after the education envisaged by the Social Studies curriculum according to the change in the pretest and posttest averages, 1'st student 1%, 2'nd student 6%, 3'rd student -6%, 4'th student -19%, 5'th student 9%, 6'th student -8%, 7'th student 2%, 8'th student -13%, 9'th student -4%, 10'th student -8%, 11'th student -14%, 12'th student -11%, 13'th student -13%, 14'th student 6%, 15'th student 1%, 16'th student -10%, 17'th student 14%, 18'th student 17%, 19'th student 6%, 20'th student has achieved a -8% change in problem solving skills. 21'st student has no change.



Graphic 3. Problem solving skills scale total averages of experimental and control groups pretest posttest

Graph 3 shows the changes in the overall average of problem-solving skills within the group after pretest and posttest. While the average of problem-solving skills of the experimental group was 77 points in the pre-test, it was 86.4 points in the post-test, which is an increase of 12.2% and statistically significant (see Table 1 and Table 2).While the group average of problem-solving skills in the control group was 92.2 points in the pre-test, it was 89.8 points in the post-test with a decrease of 2.6%. According to the data although there is a decrease, this decrease is not statistically significant.

Conclusion, Discussion and Suggestions

There is no specific study about the usage of simulation-based experiential learning and its relations to problem-solving skills encountered in the social studies discipline. In this manner, different kinds of disciplines and research results were discussed according to the theme.

Duygu (2018) concluded in her study that simulation-based education increased problem-solving skills; on the other hand, Altun and Emir (2008) conducted an experimental application on problem-solving methods in Social Studies education in their research and revealed that direct expression traditional approach did not increase problem-solving skills. Ünal, Sever and Yılmaz (2003) conducted an experimental study on problem-solving skills in Social Studies education and concluded that teaching problem-solving-oriented lessons increased student achievement according to the traditional method. Our research findings concluded that simulation-based experiential learning practices increased students' problem-solving skills compared to the teaching methods envisaged in the programme. In this context, the results are parallel. In a study on the development of simulations based on problem-solving, simulations aimed at the understanding economy and commercial life were designed. According to the research results, learners developed their self-directed learning skills and problem-solving skills in the learning process; however, they could bring realistic and multivariate solutions to problems (Maxwell, Mergendoller & Bellisimo, 2004).

When the simulation-based training method is examined, it is observed that many disciplines are used in skill-based training practice. Gülpınar (2018) conducted a simulation-based experimental study with the students of the pharmacy department with the theme of "Pharmacist-Patient Communication and Counseling Skills Training Program". According to the research results, the communication and consultancy skills of the students improved after the simulation-based education application. Chan (2011) made an application for business students to receive simulation-based training in recruitment and placement in his research. According to the research results, it has been revealed that students in simulation-based education provide many advantages in terms of empathy, experiencing an event most realistically, using skills against reality-like situations and developing permanent desired behaviors and attitudes. In another study conducted in management, it was revealed that simulations provide very realistic environments in learning and provide complex learning opportunities (Dieguez-Barreiro, González-Benito, Galende, & Kondo, 2011). Lateef (2010) stated in his research that

simulation-based education in health would increase performance and prevent possible mistakes. Şahan & Dinç (2021) researched the simulation simulation-based training's effect on disaster education in middle school students' level. In their experimental study they used machine-based simulations about the earthquake on the experimental group, and they examined the student's preparedness for disaster in experimental and control groups. According to the research findings; it was determined that the students in the experimental group prepared a disaster plan, disaster and emergency bag and determined the meeting point better, but there was no significant change in the preparedness levels of the control group in this regard. In the study of Uygun & Uzun (2019), students stated that simulation-based experiential learning practices are fun and enjoyable methods. They indicated that they learned by doing and living in lessons made with simulations, that everyone is equal, and that there is a comfortable and democratic learning environment.

Based on the research results, new kind of simulation-based learning activities on different themes, competences, skills and values in the field of Social Studies may be prepared. In-depth and different designs can be conducted on the experiential learning theory and simulation-based education related to other fields of social studies education.

Acknowledgements or Notes

Authors did not receive any grant support from any institution or organization in the study. Authors thank to the participant pupil, school administration in the study for their active contribution and participation.

Author (s) Contribution Rate

The authors contributed equally to the article.

Conflicts of Interest

The authors declared no potential conflicts of interest regarding the research, authorship or publication on this article.

Ethical Approval

Ethical permission 30.12.2020 – E-89784354-050.99-3210 was obtained from Uşak University's Social and Humanities Sciences Scientific Research and Publication Ethics Committee for this research.

References

Akçay, N. O., Akçay, A. & Kurt, M. (2016). Ortaokul öğretmenlerinin öğretim yöntem ve tekniklerine yönelik görüş ve yeterliklerinin incelenmesi. *Eğitim ve Öğretim Araştırmaları Dergisi, 5*(1), 333-342.

Akkoyun, F. (1986). Faktöryel modeller. *Ankara Üniversitesi Eğitim Bilimleri Fakültesi Dergisi, 19*(1), 295-302.

Altun, A. & Emir, S. (2008). Sosyal bilgiler dersinde problem çözme yönteminin erişi, kalıcılığa ve tutuma etkisi. *Hasan Ali Yücel Eğitim Fakültesi Dergisi, 2,* 79-100.

Beck, D., & Eno, J. (2012). Signature pedagogy: A literature review of social studies and technology research. *Computers in the Schools*, *29*, 70–94.

Bulut, O., Bulut Serin, N. & Saygılı, G. (2010). İlköğretim düzeyindeki çocuklar için problem çözme envanterinin (ÇPÇE) geliştirilmesi. *İlköğretim Online, 9*(2), 446-458.

Büyüköztürk, Ş., Çokluk, Ö. & Köklü, N. (2013). *Sosyal bilimler için istatistik (12.baskı)*. Ankara: Pegem Akademi.

Chan, A. (2011). Learner receptivity toward role play simulation in teaching H.R.M. to university students in Hong Kong. *The International Journal of Educational Researchers 2*(1), 1-16.

Çelikkaya, T. & Kuş, Z. (2009). *Sosyal bilgiler öğretmenlerinin kullandıkları yöntem ve teknikler*. *Uludağ Üniversitesi Eğitim Fakültesi Dergisi, XXII* (2), 741-758.

Çelikkaya, T. (2014). Sosyal bilgiler dersinde drama yönteminin önemi ve uygulama örnekleri. *Turkish Studies International Periodical For The Languages, Literature and History of Turkish or Turkic 9*(2), 447-470.

Çiftçi, S. (2006). *Sosyal bilgiler öğretiminde proje tabanlı öğrenmenin öğrencilerin akademik risk alma düzeylerine, problem çözme becerilerine, erişilerine kalıcılığa ve tutumlarına etkisi.* (Yayımlanmamış doktora tezi). Selçuk Üniversitesi Sosyal Bilimler Enstitüsü, Konya.

Dieguez-Barreiro, J. H.; González-Benito, J.; Galende, J. & Kondo, E. K. (2011). The use of management games in the management research agenda. *Developments in Business Simulation and Experiential Learning*, *38*, 83-90.

Duygu, E. (2018). *Simülasyon tabanlı sorgulayıcı öğrenme ortamında FeTeMM eğitiminin bilimsel süreç becerileri ve FeTeMM farkındalıklarına etkisi*. (Yayımlanmamış yüksek lisans tezi). Kırıkkale Üniversitesi Fen Bilimleri Üniversitesi, Kırıkkale.

Fowler, S. M. & Pusch, M. D. (2010). Intercultural simulation games: A review (of the united states and beyond). *Simulation & Gaming, 41*(1), 94-115.

Fraenkel, J. R., Wallen, N. E. & Hyun, H. H. (2011). *How to design and evaluate research in education.* New York: McGraw-Hill.

Göncüoğlu, Ö. G. (2010). *6. Sınıf sosyal bilgiler dersi demokrasinin serüveni ünitesinin öğretiminde drama ve işbirlikçi öğretim yöntemlerinin öğrenci tutum ve başarısına etkisi*. (Yayımlanmamış yüksek lisans tezi). Niğde Üniversitesi Sosyal Bilimler Enstitüsü, Niğde.

Gülpınar, G. (2018). *Eczacılık fakültelerine yönelik iletişim becerileri eğitim programı geliştirme çalışması: Ankara Üniversitesi Eczacılık Fakültesi öğrencileri ile simülasyon uygulaması*. (Yayımlanmamış doktora tezi). Ankara Üniversitesi Sağlık Bilimleri Enstitüsü, Ankara.

Hofstede, G. J., Caluwe, L. & Peter, V. (2010). Why simulation games work - in search of the active substance: a synthesis. *Simulation & Gaming, 41*(6), 824-843.

Kan, Ç. (2006). Etkili sosyal bilgiler öğretimi arayışı. *Kastamonu Eğitim Dergisi, 14*(2), 537-544.

Karagöz, Y. (2010). Nonparametrik tekniklerin güç ve etkinlikleri. *Elektronik Sosyal Bilimler Dergisi, 9*(33), 18-40.

Katılmış, A. (2010). *Sosyal bilgiler derslerindeki bazı değerlerin kazandırılmasına yönelik bir karakter eğitimi programının geliştirilmesi*. (Yayımlanmamış doktora tezi). Marmara Üniversitesi Eğitim Bilimleri Enstitüsü, İstanbul.

Keys, B. & Wolfe, J. (1990). The role of management games and simulations in education and research. *Journal of Management, 16*(2), 307-336.

Koç, İ. (2013). *Öğretmenlerin sosyal bilgiler dersinde drama yöntemini uygulama ve drama tekniklerine ilişkin yeterliliklerinin belirlenmesi.* (Yayımlanmamış yüksek lisans tezi). Ahi Evran Üniversitesi Sosyal Bilimler Enstitüsü, Kırşehir.

Kolb, D. A. (2015). *Experiential learning: experience as the source of learning and development (2nd edition).* New Jersey: Pearson Education.

Kumar, R. & Lightner, R. (2007). *Games as an interactive classroom technique: perceptions of corporate trainers, college instructors and students. International Journal of Teaching and Learning in Higher Education, 19*(1), 53-63.

Lateef, F. (2010). Simulation-based learning: Just like the real thing. *Journal of Emergencies, Trauma and Shock, 3*(4), 348-352.

Maxwell, N. L.; Mergendoller, J. R. & Bellisimo, Y. (2004). Developing a problem-based learning simulation: An economics unit on trade. *Simulation & Gaming, 35*(4), 488-498.

Nemerow, L. G. (1996). Do classroom games improve motivation and learning? *Teaching and Change, 3*(4), 356-366.

Passarelli, A. & Kolb, D. A. (2011). *Using experiential learning theory to promote student learning and development in programs of education abroad.* Cleveland: Department of Organizational Behavior Weatherhead School of Management Case Western Reserve University.

Raybourn, E.M. (2006). *Simulation experience design methods for training the forces to think adaptively*. Orlando/ Florida: Proceedings, Interservice/ Industry Training, Simulation and Education Conference Proceedings.

Ruben, B. D. (1999). Simulations, games, and experience-based learning: the quest for a new paradigm for teaching and learning. *Simulation & Gaming, 30*(4), 498-505.

Shubik, M. (2009). It is not just a game!. *Simulation & Gaming, 40*(5), 587-601.

Şahan, C. & Dinç, A. (2021). The effect of simulation teaching method on middle school students' preparedness for disasters. *Resilience, 5*(1), 21-36.

Tomlinson, B. & Masuhara H. (2009). Playing to learn: a review of physical games in second language acquisition. *Simulation & Gaming, 40*(5), 645-668.

Uygun, K., & Uzun, C. (2019). Sosyal bilgiler öğretiminde simülasyon tabanlı deneyimsel öğrenme yöntemi hakkında öğrenci görüşleri. *Turkish Studies-Educational Sciences, 14*(5), 2709-2727.

Ünal, Ç., Sever, R. & Yılmaz, Ö. (2003). İlköğretim sosyal bilgiler dersinde (5.sınıflar) problem çözme yönteminin uygulanabilirliği. *Osmangazi Üniversitesi Sosyal Bilimler Dergisi, 4*(2), 1-20.

Wanzek, J., Kent, S. C., Vaughn, S., Swanson, E. A., Roberts, G. & Haynes, M. (2015) Implementing team-based learning in middle school social studies classes. *The Journal of Educational Research, 108*(4), 331-344.

Article History
Received: 13.06.2021
Received in revised form: 11.09.2021
Accepted: 23.11.2021
Article Type: Research Article

International Journal of Contemporary Educational Research (IJCER)

www.ijcer.net

Systematic Analysis of the Theses Conducted in the Field of Classroom Teaching in Turkey

Pınar GİRMEN[1], Zeynep KILIÇ[2], Mehmet Fatih KAYA[3]

[1]Eskişehir Osmangazi University, 0000-0001-6194-8354
[2]Eskişehir Osmangazi University, 0000-0002-5756-3782
[3]Uşak University, 0000-0001-8494-8429

To cite this article:

Girmen, P., Kılıç, Z., & Kaya, M. F. (2022). Systematic analysis of the theses conducted in the field of classroom teaching in Turkey. *International Journal of Contemporary Educational Research*, *9*(1), 39-61. https://doi.org/10.33200/ijcer.951808

International Journal of Contemporary Educational Research

Volume 9, Number 1, March 2022, Page 39-61 ISSN: 2148-3868

Systematic Analysis of the Theses Conducted in the Field of Classroom Teaching in Turkey*

Pınar GİRMEN[1], Zeynep KILIÇ[2] Mehmet Fatih KAYA[3]**

[1,2]Eskişehir Osmangazi University,

[3]Uşak University

Abstract

This study aims to reveal the bibliometric and contextual features and problems of postgraduate theses (master's and doctoral theses) made in the field of classroom teaching in Turkey between 2010-2019. The study was carried out with a content analysis method, one of the synthesis research methods. The scope of the study included 1083 postgraduate theses related to classroom teaching in the database of the Higher Education Council (HEC) National Thesis Center (NTC). In determining the theses to be included in the scope of the study, the following criteria were taken into account: the theses would be related to classroom teaching, and the publication date of the theses would be between 2010-2019. Data analysis in content analysis research is different from qualitative data analysis. In this study, which was carried out with content analysis, firstly, the theses were handled as the analysis unit. The basic features of the theses were digitized, and codes and categories were determined to examine the theses in depth. Of the 1083 doctoral theses examined, 956 were master's theses and 127 were doctoral theses.With 181 theses, the year with the most theses was 2019. The year with the fewest theses was 2017. With 181 theses, 2019 was the year with the most completed theses. The year with the fewest completed theses was 2017. Among the theses studied, it was found that the course "Turkish Language" was studied the most and the course "Leisure Activities" was studied the least.In addition, it was revealed that there were mistakes in method, sampling, data collection tool and content in some of the theses examined.

Keywords: Classroom teaching, Primary education, Thesis examination, Postgraduate education, Systematic research

Introduction

Universities are institutions that affect the society they are in and are affected by society. Universities train the manpower required by the society and contribute to the development of science and society by producing scientific information and transforming the produced information into technology. In this respect, a university can be defined as an institution that executes education, training and scientific research and shares its results by doing publications (Baskan, 2001). The main purpose of scientific research in universities is to discover the unknown on the basis of the known and to explain the discovered (Yaşar, 1998).In universities, scientific research becomes a report with papers, articles, master's theses and doctoral theses, and the research and research results are shared with the scientific world. The reporting of scientific research through master's and doctoral theses takes place at postgraduate level. In the Higher Education Law (No. 5347), postgraduate education includes "master's and doctorate education, specialization in medicine, dentistry, pharmacy and veterinary medicine, and proficiency in art" (Higher Education Law, 1981). Postgraduate education consists of undergraduate, graduate, doctoral education and art programs. Postgraduate education aims to enable the student to gain the ability to access information by doing scientific research and to analyze and interpret the information obtained (Higher Education Council (HEC), 1996). In this respect, postgraduate education is a function of universities and can be defined as the highest level of education received by individuals, which provides them with the opportunity to specialize in their field and which contributes to the development of the country and science-technology productivity with scientific studies. As a result of postgraduate education, the individual produces a concrete product. This product is also the master's and/or doctoral thesis based on scientific research written by an individual in a company with a supervisor in line with the subject area. Individuals are writing a master's or doctoral thesis both share their research with other researchers and use them for their professional development (career, tenure, promotion, etc.)

* A part of this study was orally presented in 5th World Conference on Educational and Instructional Studies in Antalya.

** Corresponding Author: *Mehmet Fatih Kaya, mfatihkaya11@gmail.com*

by publishing the scientific research they have conducted (Tsai & Wen, 2005). Karakütük (1989) explains the importance and development of master's and doctorate education stating the following reasons: (cited in Bahçeci & Uşengül, 2018):

- *Knowledge and rapid development in technology necessitate postgraduate education even after graduating from higher education.*
- *The need for highly qualified manpower for the development of the country.*
- *The rapid development of science and technology, and universities play an important role in this regard.*
- *The prolongation of the primary education period, and the increase in the age of the population.*
- *The increasing need for faculty members in line with the increase in the schooling rate in higher education.*

Considering the above reasons, it is seen that postgraduate education is important for the development and progress of countries. Therefore, it could be stated that postgraduate education should be widespread and institutionalized, and postgraduate education is thus important in terms of scientific knowledge production. Postgraduate education is given in the areas of humanity, social, formal and educational sciences.

Scientific research in the field of educational sciences has some functions. The first is to observe, conceptualize and record learning-related events. The second function is to analyze and accurately describe the observed conditions, contexts and practices by analyzing them. The third function is to publish the information obtained as a result of observation by expanding existing educational theories or by proposing a new theory. In other words, scientific research in education is how to obtain accurate and reliable information about education (Mortimore, 2000). In addition, scientific research in education both fills the gap between theory and practice and allows education stakeholders, especially teachers, to create professionally rich learning environments (Ion & Iucub, 2016). Education programs, especially at master's and doctoral levels, contribute to the training of qualified scientists who are recognized at national and universal levels (Tavşancıl et.al., 2010). In addition to being valid and reliable studies, theses can scientifically arrange the development course of the related field with their features such as being defended in front of a scientific jury and showing methodological and thematic tendencies at certain times instead of repeating similar studies. In this respect, the best way to define a field of science is by examining the theses prepared in that field (Şenyurt & Özkan, 2017).

Examining scientific studies put forward through theses and determining the trends of scientific research act as a guide for both teachers and researchers. In other words, examining and analyzing previous studies conducted in the field of education provides teachers with information about new applications while guiding other researchers for further research (Chang, Chang & Tseng, 2010; Fensham, 2004). Moreover, questioning the quality of educational studies, obtaining results through research and revealing the quality and usability of these studies are of great importance (Karadağ, 2009).

Various studies have been conducted to examine the studies carried out in the field of educational sciences in Turkey. These studies generally cover the examination and evaluation of published articles, presented reports, master's theses and doctoral theses in the field of educational sciences, teaching and curriculum (Arık & Türkmen, 2009; Bıkmaz, et.al., 2013; Doğan & Tok, 2018; Erdem, 2011; Ergun & Cilingir, 2013; Eskici & Çayak, 2017; Fazlıoğulları & Kurul, 2012; Göktaş, et.al., 2012; Gömleksiz & Bozpolat, 2013; Karadağ, 2009; Karadağ, 2010; Koç, 2016; Kurt & Erdoğan, 2015; Saban, et.al., 2010; Taş & Özkaral, 2015; Tavşancıl, et.al., 2010), educational technologies (Alper & Gülbahar, 2009; Bozkaya, Aydın & Genç-Kumtepe, 2012; Kurtoğlu & Seferoğlu, 2013; Şimşek, et.al., 2008; taş, Emritekin & Süral, 2019), education management (Polat, 2010; Aydın & Uysal, 2011), science education (biology, physics, science) (Bacanak, et.al., 2011; Çalık, et.al., 2008; Doğru, et.al., 2011; Karamustafaoğlu, 2009; Küçüközer, 2016; Lee, Ying-Tien & Tsai, 2009; Soslu, 2016; Topsakal, Çalık & Çavuş, 2012; Wassink & Sadi, 2016), mathematics education (Baki, et.al., 2011; Çiltaş, Güler & Sözbilir, 2012; İnceoğlu, 2009; Yenilmez & Sölpük, 2014), social sciences education (Canbulat, Avcı & Sipahi, 2016; Geçit & Kartal, 2010; Oruç & Ulusoy, 2008; Şahin, Yıldız-Göğebakan & Duman, 2012; Tarman, Güven & Aktaşlı, 2011), Turkish teaching (Boyacı & Demirkol, 2018), teaching reading (Elbir & Bağcı, 2013), social life teaching (Tezcan-Apak & Güllühan-Ütkür, 2019), teacher leadership (Koşar, et. al., 2017), teaching programming (Eryılmaz & Deniz, 2019), measurement and assessment (Şenyurt & Özkan-Özer, 2017); special education (Çoşkun, Dündar & Parlak, 2014), drama in preschool education (Can-Yaşar & Aral, 2011); geography teaching (İncekara, 2009), value education (Kapkın, Çalışkan & Sağlam, 2018), classroom teaching and primary school teachers (Akpunar, Kazu & Erdamar, 2018; Anılan, et.al., 2018; Bağcı, 2012; Bektaş, Dündar & Ceylan, 2013; Doğan, 2018; Küçükoğlu & Ozan, 2013; Özenç & Özenç, 2013; Şahin, et.al., 2013; Şahin, 2019; Ünal & Arık, 2016).

Looking at the studies that have been conducted to identify general trends in education, one finds that the studies have been examined both under a general heading such as curricula and education and in the context of specific areas such as measurement and assessment in education, educational technology, and instruction. These studies focused on specific characteristics (year, method, data collection instrument, data analysis method, etc.), subject areas, number of authors, journal name, and data sources.Very few studies included mistakes and problems. In addition, year intervals were considered in some studies examining theses or articles.

The scope of this study included postgraduate theses on classroom teaching. What makes the present study different from others is the in-depth analysis of 1083 theses conducted between 2010-2019. Concerning the difference, it could be stated that there was no research conducting in-depth examination of more than 1000 theses between the years mentioned. The purpose of this study was to reveal the bibliometric features, content features and problems encountered in the theses conducted in the field of classroom teaching. In this respect, it is thought that it is important and necessary to examine the theses conducted in the field of classroom teaching and to reveal the related tendencies in detail. It could be said that this study is important to determine the issues that have not been previously studied in the field of classroom teaching, to show the research trends, to determine the problems in the theses, to serve as a guide for researchers who want to conduct research in the field of teaching, and to provide a resource that can benefit researchers in the field.

Purpose

This study aimed to reveal the bibliometric features, content features and problems encountered in the postgraduate theses (master's and doctoral theses) completed in the field of classroom teaching in Turkey between 2010-2019. Within the framework of this general purpose, the following research questions were directed:

1. What is the distribution of the theses examined within the scope of the study in terms of
   - Year,
   - Thesis type,
   - Method,
   - Data sources (Universe, sample, study group, participant)
   - Data collection tools,
   - Data analysis techniques?
2. What is the distribution of the theses examined within the scope of the study in terms of
   - Research topic
   - Field of research,
   - Education level?
3. What are the mistakes in the thesis examined in terms of the scope of the study?

Method

Research Model

This study was carried out using the content analysis method. Content analysis is defined as "a research method that provides a systematic and objective tool for making inferences from written-visual-verbal data" (Downe-Wambolt, 1992, p.314; cited in Bengtsson, 2016). Content analysis is a research method used to make repeatable and valid inferences from verbal-written-visual materials, to identify and reveal certain phenomena in these materials, to determine the main structures, to classify the main structures, and to show the trends in a field or literature (Krippendorf, 2019; Weber, 1990). In addition, content analysis method is used to reach hidden meanings based on the apparent meanings in verbal-written-visual materials (Cole, 1988). Concerning content analysis, it is a method that emerged as a research method in the 1940s with its initial aim of determining the explicit content in different materials (verbal, written and visual) and with its later aim of revealing the hidden patterns, relationships and meanings in different materials (verbal, written and visual). It could be stated that it is a method used to obtain different patterns. In recent years, content analysis can be used for both purposes (Gaur & Kumar, 2017). Content analysis is a research method for making replicable and valid inference from data to their context to provide knowledge and new insights (Elo & Kyngas, 2008). Content analysis has been used broadly to understand a wide range of themes such as social change, cultural symbols, changing trends in the theoretical content of different disciplines and making replicable and valid inference from data to their context to provide knowledge, insights (Elo & Kyngas, 2008; Prassad, 2008).

In this study, content analysis was preferred as a method because the purpose was to conduct in-depth examination of the master's and doctoral theses about classroom teaching in Turkey between 2010-2019. In the study, there were two reasons why the content analysis method was preferred:

First reason: In this study, the postgraduate theses in the field of classroom teaching were accepted as written material. This reason overlapped the content analysis purpose of "making repeatable and valid inferences from verbal-written-visual materials, identifying certain phenomena in these materials, and determining the main structures"; therefore, content analysis method was used in the study. In this respect, the aim of the study wasstudy aimed to reveal certain phenomena such as year, type, method, data sources, data collection tools, data analysis

types, topics and fields in the postgraduate theses accepted as written material and to determine the current trends in classroom teaching.
Second reason: The second reason was to identify the problems that arose in the postgraduate theses in the field of classroom teaching. These problems were not obvious problems in the theses. These were the problems revealed by the researchers within the context of the statements in the theses. Therefore, the content analysis method was used in the study because this reason overlapped the content analysis purpose of "reaching the hidden meanings based on the apparent meanings in the verbal-written-visual materials".
Third reason: Also, one of the most frequent uses of the content analysis is to study the changing trends in the theretical content a methodological approaches by content analyzing the journal articles of the discipline (Loy, 1979 cited in: Prassad, 2008). Because this study aimed to reveal the bibliometric features, content features and problems encountered in the postgraduate theses (master's and doctoral theses) completed in the field of classroom teaching in Turkey between 2010-2019, content analysis was preferred as research method in this study.

Scope of the Study

The scope of this study, which aimed to examine the postgraduate theses about classroom teaching between 2010 and 2019 in Turkey, covered 1083 postgraduate theses on classroom teaching in the database of the National Thesis Center (NTC) of Higher Education Council (HEC). Criterion sampling, one of the purposeful sampling methods, was used to select the theses examined in the study. The understanding in criterion sampling, which is a type of purposeful sampling, is to use a series of criteria while selecting the participants/scope of the study (Yıldırım & Şimşek, 2011). The criteria used in determining the theses examined in the study were as follows: the theses were conducted in the field of primary school teaching /classroom teaching; the publication date of the theses was in the range of 2010-2019; and the theses were given permission for full-text viewing/downloading. The publication date of the theses was in the range of 2010-2019 because there were frequent changes in primary school curricula between 2010-2019. The detailed search in the National Thesis Center (NTC) of Higher Education Council (HEC) database was used to determine the theses to be included in the scope of the study. Image 1 shows the detailed search interface of Internet website of HEC-NTC.

Image 1. Interface of the National Thesis Center (NTC) of Higher Education Council (HEC)

In Image 1, there are boxes such as "University", "Institute", "Division", "Discipline" and "Permission Status" in the detailed search in the HEC-NTC database. While determining the theses within the scope of the study, "Primary School Teaching" and "Classroom teaching" were written in the box of Discipline. In the box of Division, "Classroom teaching" and "Primary School Teaching" were written. In addition, in the box of Permission Status, "permitted" was written. After writing the words as mentioned earlier in the boxes, a separate search was done. As a result of the investigation, 1083 theses were reached.

Data Collection

Several steps were followed to collect data within the scope of the study. First, the years when the theses were conducted were determined following the research purpose. After reviewing the related literature, the year range was decided to be 2010-2019. The reasons for choosing the period from 2010 to 2019 were as follows: After reviewing the literature, there was no comprehensive research aimed at examining the postgraduate work on teaching conducted between these two years; and there have been frequent changes in the curricula of elementary

schools in Turkey in recent years.The “permitted” theses on classroom teaching were reached as a result of the search done by writing "Primary School Teaching", "Classroom teaching", "Primary Education" in the boxes of "Division" and "Discipline" in the "Detailed Search" section of the HEC-NTC database. As a result of these searches, 1083 postgraduate theses were reached, the last being dated 16.01.2020.
This study was limited to 1083 theses conducted between 2010 and 2019, published in the HEC-NTC database and given permission for viewing. During the data collection process, retrospective reviews were performed several times, and theses that were permitted to be viewed later were encountered and included in this study. Because the abstracts of the dissertations that were not open to acess, these dissertations were not included in the study.However, after the data collection process was completed, it was possible that there could be theses permitted for viewing. This situation constituted another limitation of the study.

Analysis of Data

Data analysis in content analysis research is different from qualitative data analysis. Content analysis research provides the researcher with flexibility in data analysis. While analyzing the data in content analysis research, with the help of frequency, the researcher can statistically express the meaning obtained from the written/visual/verbal documents and make in-depth interpretations (Duria, Reger & Pfarrer, 2007). In addition, content analysis converts qualitative data into a quantitative form and, where appropriate, facilitates interpretation of the data within quantitative frameworks (Woods, et.al., 2005). Data analysis in content analysis studies is carried out by determining the analysis unit and codes, considering the frequency of repetition of codes, forming the categories from codes, ensuring validity of the categories created and applying the coding process to all the analysis units (Weber, 1990).
The steps applied for data analysis in content analysis studies were in the present study as follows: In this study carried out with content analysis, first, the theses were examined as analysis unit. The main features of the theses were digitized, and codes and categories were determined for in-depth examination of the theses. For this, a "publication review form" developed by the researchers was used. There were subheadings in the publication review form such as "year, thesis type, subject area, discipline, data source, method, data collection tool, data analysis, and mistakes made". The researchers examined the theses independently and filled out the thesis examination form. Using the thesis examination form, the emerging features related to the theses were digitized in the form of frequency, and the contextual features of the theses were transformed into categories and themes.

Credibility

In this study, several applications were conducted to ensure validity and reliability (Duria, Reger & Pfarrer, 2007). First, the years in which the theses to be included in the study were published were determined. To ensure the originality of the data source, the theses in the HEC-NTC database, which is an electronic information system archiving theses in Turkey, were used. The publication review form was used for the analysis of the data. The publication review form prepared by the researchers was given to two experts (in the field of classroom teaching and science education) who previously conducted similar research, and the experts were asked to evaluate the appropriateness of the publication review form in terms of its scope and content. The experts gave feedback on the publication review form, suggesting that the subheading of the data collection tools be divided into more detailed subheadings. In line with the feedback provided by the experts, the publication review form was finalized. The criteria regarding the subheadings in the publication review form were filled in separately by the researchers. After the researchers independently filled out the publication review form, they came together and evaluated the publication review forms for each thesis and reached a consensus. In cases of disagreement, the theses were examined again. After completing the publication review form and reaching a consensus on the accuracy of the data obtained through the publication review form, the data were analyzed. A coding scheme was prepared for the analysis of the data. The frequencies of the theses regarding their characteristics such as year, thesis type, data source, method, data collection tool and data analysis were noted in the form. The contextual features of theses were also turned into categories and themes. The characteristics of the theses were presented in the form of tables and figures, and examples belonging to the categories and themes were given directly. In addition, the research process was explained in detail.

Ethic

The HEC-NTC database was used to reach theses within the scope of the study. Since the theses were open access, there was no need to obtain permission from any institution. No information was given to describe a person or an institution about the name, code, author and institution of the theses examined within the scope of the study. Therefore, the theses were defined with different codes while giving direct quotations in the findings section. The coding format of the theses is shown in Image 2.

As can be seen in Image 2, the master's theses were coded as "M", doctoral theses as "D", year as "10, 15, … 19" and the sequence number as "01". The theses were numbered randomly. Numbers like 10, 15, … 19 are written for the years referred to the years 2010, 2015… 2019. For example, the code of TM1001 code in a thesis referred to the number-one master's thesis published in 2010, and the code of "TD1501" referred to a doctoral thesis published in 2015.

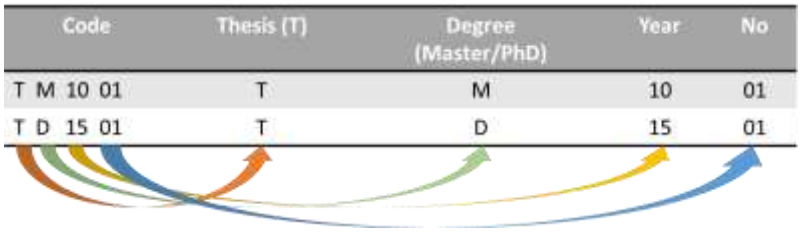


Image 2. Coding of the theses examined in the study

Findings

The data obtained in this study are presented under themes in Figure 1 in the form of "Bibliometric features", "Contextual features" and "Problems".

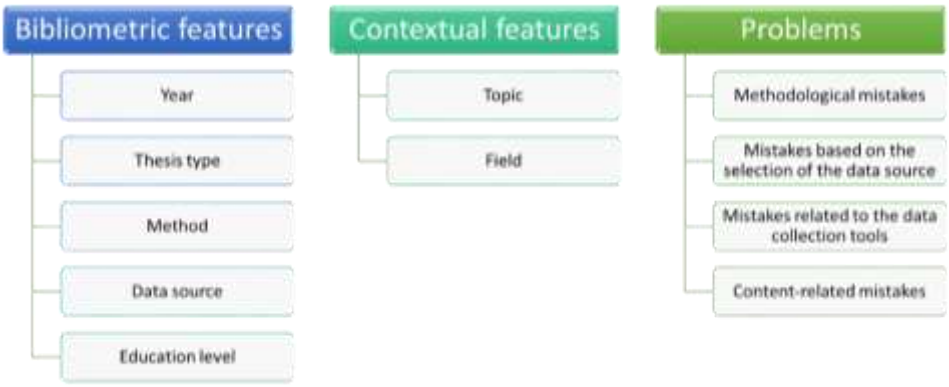


Figure 1. Features of the postgraduate theses conducted in the field of classroom teaching

Bibliometric features of the postgraduate theses conducted in the field of classroom teaching

The concept of bibliometry is defined as "the application of statistical and mathematical methods to books, journals and similar communication media" (Pritchard, 1969, cited in Özkaya, 2019). Therefore, in studies based on bibliometry, various findings are obtained by analyzing certain characteristics of documents or publications (keywords, year, methods used, etc.). In this study, the concept of bibliometry was considered as a theme. The year, thesis type, method, data source and data collection tools were considered the bibliometric features of the postgraduate theses published in classroom teaching between 2010 and 2019, and the distribution of these features was shown with frequency.

Distribution of the theses by year and thesis types

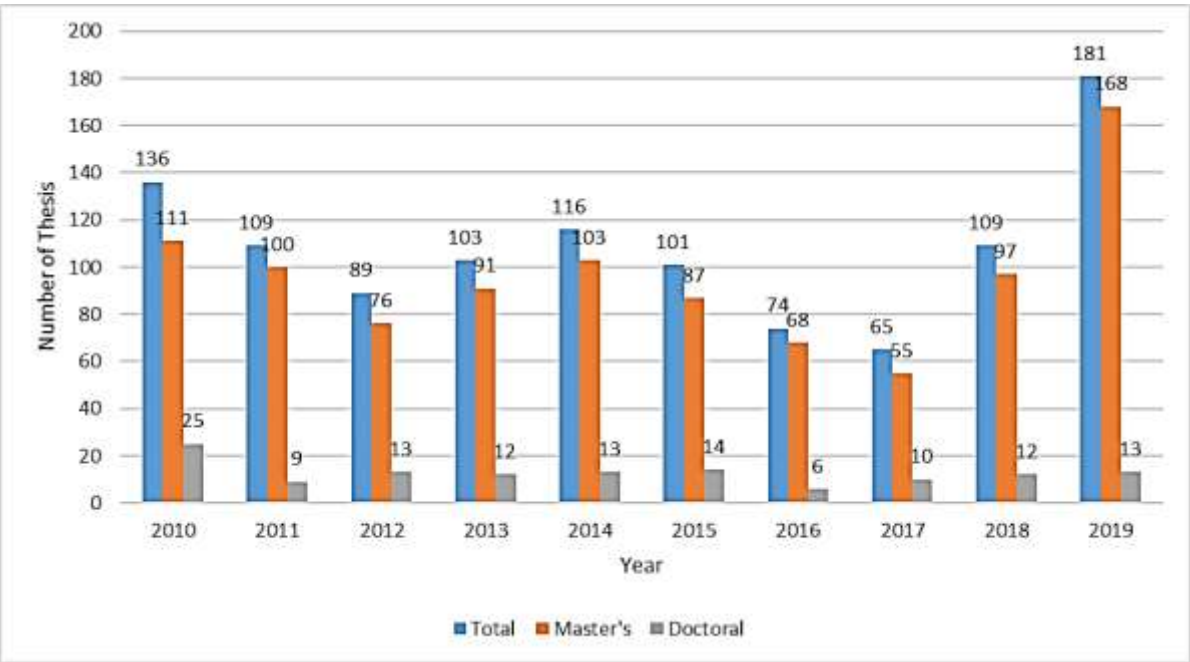
The numbers of the postgraduate theses conducted in the field of Classroom teaching can be seen in Table 1, and the distribution of these theses by year is shown in Graphic 1.

Table 1. Numbers of the theses conducted in the field of classroom teaching between 2010-2019

	Number of theses	Master's Thesis	Doctoral Thesis
Total	1083	956	127

As can be seen in Table 1, between 2010-2019, the total number of postgraduate theses in the field of classroom teaching was 1083, including 956 master's theses and 127 doctoral theses. Accordingly, approximately 96 master's theses and approximately 13 doctoral theses were published annually.

According to Graphic 1, in terms of year of publication, the highest number of theses belonged to the year 2019, and the lowest number of theses was in 2017. Although the number of final papers varied by year, it could be seen that the number of final papers decreased until 2017 and increased after that year. However, when the number of doctoral theses was examined, it was seen that 25 doctoral theses were published in 2010 and 13 doctoral theses in 2019. Therefore, there was a decrease in the number of doctoral theses over the years. Another remarkable point was that the number of doctoral theses could not exceed 14 after 2010 and even remained below 10 in some years.



Graphic 1. Distribution of the theses by year and thesis type

Distribution of the theses concerning methods

The distribution of the theses concerning their methods can be seen in Table 2. According to the Table 2, the methods of the postgraduate theses conducted in the field of classroom teaching were the methods used in educational sciences. The intersection of rows and columns was made following the statements in the theses. For example, the intersection of the row "Quantitative" and the column "Quantitative" refers to the statement "In this study, the quantitative research method was used"; the intersection of the row "Survey" and the column "Quantitative" refers to the statement "In this study, the survey model, one of the quantitative research methods, was used"; the intersection of the "Document Analysis" row and the "Qualitative" column referred to the statement "In this study, the document analysis, one of the qualitative research methods, was used"; the intersection of the "Quantitative" row and the "Quantitative" column referred to the statement "In this study, the quantitative research method was used."

In the theses, "quantitative method" and "survey model" found under the quantitative method were the most common ones, while the “meta-analysis” method was the least used method. Below are explanations of each method and model with sample statements from the theses regarding the method used. Moreover, in Table 2, the studies that could not be classified were examined under "other studies" heading.

Table 2. Distribution of the theses with respect to their methods

	Survey	Quantitative	Qualitative	Mixed	Action	Meta-analysis	Total
Quantitative		3					3
Survey	337	135	33				505
Experimental		158					158
Causal		13					13
Scale development		3					3
Historical research method	1						1
Qualitative			34				34
Case study			78				78
Phenomenology			28				28
Ethnography			2				2
Grounded Theory			2				2
Document analysis			31				31
Naturalistic inquiry approach			2				2
Interview method			7				7
Content analysis model			2				2
Descriptive analysis method			1				1
Basic qualitative research			3				3
Historical research method			1				1
Mixed				142			142
Action			29		12		41
Meta-analysis						4	4
Total	338	312	253	142	12	4	1061

Survey Model: In the theses examined, expressions such as "survey model, general survey model, descriptive survey model, descriptive model, questionnaire-based survey model, survey model, cross-sectional survey model and relational survey" were gathered under "survey model". Accordingly, as the method applied in the studies, the survey model was used most in 505 theses, constituting almost half of the total number. In this respect, the survey model was used alone as a research method in 337 theses. The survey model was used as the sub-model or upper-model of the quantitative research method in 135 theses and of the qualitative research model in 33 theses. In addition, there were theses stating the mixed research method as a sub-model of the survey model. Relevant examples are presented in Table 3.

Table 3. Sample statements regarding the survey model in the theses examined

Code	Statement found in the method section
TM1001	*"...is a descriptive study using the survey model ..."*
TM1002	*""Descriptive method" was applied to determine the current situation in the study..."*
TM1003	*"This is a descriptive study carried out using the relational survey model of the general survey type..."*
TM1201	*"...This is a descriptive study. In the process of describing the situation, qualitative and quantitative methods (mixed method) were used together..."*
TM1401	*"...Qualitative research method was used in this study, and the general survey model was applied..."*
TM1402	"*This is a descriptive study conducted using the survey model, one of the quantitative research methods..."*
TM1403	*"In this study, the survey research model, one of descriptive methods, was used."*
TM1601	*"This study was carried out with the relational survey model to determine ..."*

When the examples in Table 3 are examined, it could be stated that there was no clear consensus on the concepts of "Survey Method/Model" and "Descriptive Method/Model". The reasons for this situation could be due to the methodology-related knowledge that the individuals who wrote the thesis acquired during their postgraduate education and different interpretations of what is written in method-related resources. In this respect, the issue of which types of studies are in the survey model can be evaluated, and solutions to the methodological concept confusion can be produced.

Quantitative Research Method: According to Table 2, the quantitative method was used in 312 of the theses. In addition, there were theses including "quantitative research, experimental, causal (correlational)" models and "scale development/adaptation" studies within the scope of quantitative method (Table 4). The theses, including the statement of "survey model, one of the quantitative research methods, was used" were evaluated above within the scope of the survey model.

Table 4. Sample statements regarding the quantitative research in the theses examined

Code	Statement in the Method Section
TM1004	*"... using the relational and casual research model"*
TD1001	*"... the casual-comparative research model was used in the study."*

As shown in Table 4, in the theses where quantitative research was used as a method, the research types found within the scope of quantitative research were used.

Qualitative Research Method: When Table 2 is examined, it is seen that the qualitative research method was used in 253 of the theses within the scope of the study. In this respect, there were theses in which the qualitative research method was used directly and theses in which the qualitative research models of "case study, phenomenology, ethnography, action research, grounded theory, document analysis, basic research model and naturalistic inquiry approach" were used.
The case study method was used most within the scope of qualitative research, while the "Grounded Theory" was used in two theses. In some studies, the grounded theory was not used alone in that it was used within the survey model in one study and as a data analysis technique in another study. Accordingly, it could be stated that there was a methodological confusion about the "Grounded Theory" method. Sample statements regarding qualitative research are presented in Table 5.

Table 5. Sample statements regarding qualitative research in the theses examined

Code	Statement in the Method Section
TM1005	*"Interview technique, one of qualitative research methods, was used."*
TM1006	*"In this study, the Grounded Theory approach, one of qualitative research methods, was used."*
TM1202	*"The qualitative research method was adopted in this study. ... qualitative research, also known as field research."*
TM1404	*"face to face interview method", one of the qualitative research methods, was used, and "semi-structured interview" in terms of structure, "personal interview" in terms of participant and "written interview" in terms of communication and recording format were used ..."*
TD1501	*"The naturalistic inquiry approach, one of qualitative research approaches, was used."*
TM1602	*"This is a qualitative study in the phenomenology design, which is included in the interpretive research paradigm."*
TM1701	*"This study was conducted using document analysis, which is one of qualitative research methods."*
TM1702	*"In this study, the qualitative method as the research method and document analysis and descriptive analysis as the research design were used."*
TM1801	*"In the study, the basic research method, one of qualitative research models, was applied."*

As shown in Table 5, it could be stated that there was a concept confusion regarding qualitative research. In addition, it is also noteworthy that the "interview method and document analysis/analysis", which are data collection tools or data analysis techniques, were handled as a research model or pattern.

Mixed-Method: Mixed method was used in 142 theses. It could be stated that the mixed method, which has been popular in educational sciences in recent years, has started to be used more in theses. Table 6 shows the statements about the mixed method.

Table 6. Sample statements regarding the mixed research method used in the theses

Code	Statement in the Method Section
TD1701	*"This study was carried out using mixed research method and experimental design model with pre-test and post-test control group."*
TM1603	*"In the study, quantitative and qualitative methods were used."*
TM1301	*"The study was designed with the survey model involving the questionnaire and interview techniques. For this reason, the mixed method, which includes quantitative and qualitative models successively, was used."*
TD1002	*"The study was designed following both quantitative and qualitative research techniques."*

According to the statements presented in Table 6, the mixed method was considered as a combination of qualitative and quantitative research types. However, it could be stated that there was no explanation regarding the types of the mixed method.

Action Research: As can be seen in Table 2, action research was used in 41 theses examined. However, while action research was among the qualitative research types in 29 of these theses, it was taken as a separate research method in 12 theses. The statements regarding action research are presented in Table 7.

Table 7. Sample statements regarding the action research method used in the theses

Code	Statement in the Method Section
TM1901	*"... this was a qualitative study ... "action research" design was preferred."*
TM1604	*"The action research method, one of Critical Theory Approach, was used."*
TM1703	*The action research method, which is among qualitative research models, was used.*

When the statements in Table 7 are examined, it could be stated that there was no methodological consensus regarding action research. The reason for this situation might be due to the explanations in national and international methodology-related sources regarding action research in educational sciences.

Meta-analysis: In four of the theses, the meta-analysis method was used. Unlike qualitative and quantitative research, Meta-analysis research is one of the synthesis research types (Andrews & Harlen, 2006). The reason why there are few theses in which meta-analysis is used can be attributed to its spread in recent years.

Other research methods: In 14 theses, different research methods were used other than qualitative, quantitative and mixed methods, and no research method was mentioned in 8 theses (Table 8).

Table 8. Distribution of the theses with respect to the research methods

Method	
Analytical model	1
Methodological evaluation	1
Design-based research	1
Lesson study	1
Theoretical research, review of literature	7
Basic research (simulation study)	1
No reference to a research method or model	8
Total	22

According to Table 8, these methods were "methodological evaluation, analytical model, design-based research method, lesson study and basic research". At the same time, it was seen that some of the theses were theoretical and some did not have a method part. In addition, there were theses in which the theoretical survey/analysis study was presented as the "survey model". Related statements can be seen in Table 9.

Table 9. Sample statements regarding other research methods

Code	Statement in the Method Section
TM1704	*"In this study, the literature review and analysis method was used ... its historical development was given, and the historical method (chronological information) was used to better understand this process."*
TM1605	*Basic research is a "simulation study" since its data are produced simulatively.*
TD1401	*"Design-based research method was used in this study."*
TM1203	*"This study was organized as a methodological evaluation study."*
TM1008	*"...this was a study carried out using the analytical model as it aimed to reveal the relationship ..."*

Distribution of the theses concerning the data source

The distribution of the theses in terms of the data source is presented in Table 10.

Table 10. Distribution of the theses concerning the data source

	Number of data sources					
	1	2	3	4	5	Total
Student	453	74	28	3	2	560
Teacher	284	103	39	3	2	431
Preservice teacher	92	2	2		1	97
Document (coursebook, archive, related documents, curriculum, thesis, article, storybook, etc.)	66	14			1	81
Parent	11	14	32	3	2	62
Administrator	3	20	11	3	2	39
Academician	1	3	1			5
Inspector			2			2
Other (Different age and profession groups, public education trainee, qualified instructor, etc.)	1	1	1			3
School	1					1
Total	912 theses	171 theses				

The data in Table 10 were classified following the use of the relevant data sources alone or in combination with other data sources in the theses. For example, in 453 theses, "student" was used as a single data source, while in 74 theses, it was used together with another data source and in 28 theses with two other data sources.
According to Table 10, only one data source was used in most of the theses (about 84%), while different data sources were used in other theses. In this respect, students, teachers and preservice teachers were used at most as a data source in the theses, while academicians, inspectors, other age and occupational groups and school (history) were used at least as a data source. Within the scope of the study, it could be stated that it is quite natural to work with students, teachers and teacher candidates, who are the main stakeholders in the field of classroom teaching. However, the low number of theses made with parents, administrators and academicians, who are the other stakeholders of education, can be regarded as a deficiency.

Distribution of the data sources in the theses concerning class grade and education level
Table 11 presents the distribution of the theses concerning the class grade and education level which they are related to. In the classification, attention was paid to whether or not the theses were related to the field of teaching. In this regard, the "5th grade", which was part of the primary level before 2012, was later transferred to the secondary level after 2012. Therefore, in this study, the theses involving the "5th grade" before 2012 were included in "primary school education level" and those after 2012 in "secondary school education level".

Table 11. Distribution of the data sources of the theses with respect to class grade and education level

Primary school (1st-4th grades; 1st-5th grades before 2012)		801
Primary school (1st-8th grades)		68
Secondary school (5th-8th grades after 2012)		43
Mass education		23
Non-categorical (adults, act of congress, etc.)		16
Preschool		15
Primary school, secondary school, high school (1st-12th grades)		7
Basic education (preschool and primary school level)		6
Special education		6
Secondary school (high school, adolescents (12-18 years old))		6
Child		3
University (bachelor's degree) (total: 85)	Classroom teaching	72
	Mixed (Classroom teaching and other fields of teaching)	10
	Other	3
Academician (total: 5)	Classroom Teaching	4
	Mixed (Classroom Teaching and other fields of teaching)	1
Total		1083

According to Table 11, a total of 907 theses were carried out involving data sources directly related to the field of classroom teaching (primary school students, classroom teaching preservice teachers, etc.). In addition, though accepted to belong to classroom teaching, several theses that were not directly related to this field involved different education levels (pre-school, primary school, secondary school, mass education, teaching programs other than classroom teaching). In this respect, 90 theses were conducted with data sources that were not directly related

to the field of classroom teaching, and 16 theses were not related to any education level. According to Table 11, preservice teachers were mostly used as a data source at university level. At the same time, it was seen that there were quite a few theses at postgraduate levels and with academicians. Based on this, it could be stated that there is a need for theses to be conducted with academicians and at master's and doctoral levels.

Distribution of the theses concerning the data collection tools

Table 12 shows the distribution of the theses concerning the data collection tools.

Table 12. Distribution of the theses concerning the data collection tools

Number of data collection tools						
	1	2	3	4	5	Total
Scale	499	210	42	39	7	797
Interview	91	88	58	43	7	287
Test	52	143	37	31	7	270
Document	66	38	35	37	7	183
Observation	7	24	32	35	7	105
Total	715	503	204	185	35	

As can be seen in Table 12, the tools used for similar purposes are presented under a common concept. "Inventory, scale, questionnaire, evaluation form, scoring key, and rubric," which had the same purpose, form, and content, but were expressed in different ways in the theses, were grouped under the name "scale"; "achievement test, intelligence test, skill test, etc." under the name "test"; "diary, student products, field notes, anecdotal logs, and document review form" under the name "document"; and data collection instruments indicated as "observation" and/or "video" were grouped under the name "observation." However, in reviewing the final papers, it was noted that some of the data collection instruments were used conceptually interchangeably or incorrectly. This situation has been presented in detail under the heading of "Mistakes and Problems". The most common data collection tool was "scale" in 797 theses, and the least common one was "observation" in 105 theses. One data collection tool was used in 715 theses, and more than one data collection tool was used in 368 theses.

Content features of the theses

Within the scope of the study, the characteristics of the theses related to the courses and the field were considered as contextual features. The distribution of the theses concerning the disciplines can be seen in Table 13.

Table 13. Distribution of the theses with respect to the related courses

Disciplines	Master's Degree	Doctoral Degree	Total
Turkish Instruction	161	37	198
Literacy Teaching	34	6	40
Mathematics	102	13	115
Science	93	13	106
Social Sciences	59	18	77
Social Life	43	5	48
Information Technologies	20	2	22
Human Rights, Democracy and Citizenship	15	2	17
Fine Arts and Art Education	11		11
Music	8	1	9
Media Literacy	8		8
English	6	3	9
Physical Education and Playing	2		2
Religion and Moral Values	2		2
Traffic Safety	1		1
Leisure Activities	2		2
More than one discipline (Interdisciplinary) (Social Life and Social Science-2, STEM-5, Turkish and Mathematics-4, Turkish and English-1)	10	2	12
Total	577	102	679

According to Table 13, most of the theses were related to Teaching How to Read and Write in Turkish. In addition, it was striking that the number of theses related to the courses of Mathematics, Science, Social Science and Social Life was high. However, there were fewer than 10 theses regarding Music, Media Literacy, English, Physical Education and Playing, Religion and Moral Values, Traffic Safety and Leisure Activities. It was seen that the number of doctoral theses related to the courses of Social Life, Information Technologies, Human Rights, Democracy and Citizenship, Music and English was 5 or lower. Moreover, there was no doctorate thesis related to the courses of Fine Arts and Art Education, Media Literacy, Physical Education and Playing, Religion and Moral Values, Traffic Safety and Leisure Activities". Within this framework, it could be stated that most postgraduate thesis focuses on the basic courses of the primary school period. Most of the postgraduate theses focused on the basic courses of the primary school period. This situation could be explained with the preferences of postgraduate students, with the importance attached to the basic courses at primary school level, the high number of expert academicians giving these courses, the low number of academicians expert in other courses.
Apart from the theses prepared in relation to the courses, there were also other theses that were not conducted within the scope of any course but included various subjects of the related education. Table 14 presents the distribution of the theses concerning their topics.

Table 14. Distribution of the theses concerning their topics

	Master's thesis	Doctoral Thesis	Total
Educational management, class management	56	2	58
In-service education, teachers (skills, views, etc.)	51		51
Special Education (inclusive, gifted, other impairment groups)	45		45
Teacher training, preservice teachers	30	8	38
Educational policies (curriculum, laws and decisions, councils, etc.)	25	2	27
Psychological Counseling and Guidance	24	2	26
Cognitive characteristics (academic achievement, thinking skills, etc.)	22	3	25
Values education	22	2	24
Other (Healthy diets, homework, unions)	20	1	21
Affective characteristics (attitude, perception, motivation, etc.)	20		20
Measurement and evaluation	13	3	16
Environmental education (literacy, consciousness, etc.)	12		12
Family participation, family training, parental views	8	1	9
Drama	7		7
Migration, multicultural, foreign students	7		7
Educational philosophy, sociology (critical education)	5		5
Science education	4		4
History of education	4		4
Mass education (public education, life-long learning, etc.)	2		2
Museum education	1		1
Early childhood education	1		1
Methodology (examining related research)	1		1
Total	380	24	404

In Table 14, the directly related topics are presented together. For example, theses written about affective characteristics such as "attitude, perception and motivation" were categorized as "Affective characteristics", and theses written regarding cognitive features such as "academic achievement, levels of learning and levels of understanding" were categorized as "Cognitive features".
According to Table 14, the theses were mostly based on topics related to education management (including "classroom management"). In addition, topics concerning special education, teacher training and education policies were also prominent. It was seen that the least frequent topics were museum education and early childhood education. In general, it could be stated that the postgraduate theses conducted in classroom teaching focused on different topics. This diversity could be considered important for enriching the field of classroom teaching.

Mistakes made in postgraduate theses in the field of Classroom teaching

Various mistakes were encountered in some of the theses examined. These mistakes were classified in terms of "method", "sample ", "data collection tools" and "content ". Figure 1 presents the methodological mistakes.

The methodological mistakes made in some theses were categorized as content not reflecting the heading of the method, incorrect use of concepts and misconception. Table 15 shows sample statements regarding the methodological mistakes.
The methodological mistakes made in some theses were categorized as content not reflecting the heading of the method, incorrect use of concepts and misconception. Table 15 shows sample statements regarding the methodological mistakes.

Table 15. Sample statements regarding the method logical mistakes in the theses examined

Code	Mistake	Sample Statement
TM1010	Content not reflecting the heading of the method	The research model is not included under the heading of the method. Under the heading of "*Data Collection Techniques" was the statement, "the research data were gathered using documentary analysis and qualitative research techniques. In addition, verbal data were obtained with the interview method*."
TM1103	Content not reflecting the heading of the method	Under the heading of "Method" was the statement of "*Findings were obtained following qualitative research techniques, and the analysis part was conducted with the chi-square test, which is one of the quantitative research techniques. All the results were interpreted using a descriptive research design*."
TM1204	Misconception	"In the study, *... the experimental design with pretest and posttest control group was used to reveal the difference between ... skills and attitudes ... Our study also involves the action research design… That's, we used both methods together to collect data regarding a subject with qualitative research methods, to interpret the collected data, to clarify the quantitative findings and to explore different dimensions of the data obtained from the participants; thus, we also used the mixed research method in our study.*"
TM1205	Misconception	"*This is a case study in which qualitative and quantitative research methods were used together… Case studies can be carried out with a quantitative or qualitative approach… This study was conducted using a descriptive design with the survey model to determine the activities, methods, strategies, techniques and materials used by primary school teachers."*
TM1405	Misconception	"*Although the experimental study conducted by the researcher in this study had a quantitative design, the observation form used while observing student behavior had a qualitative aspect. In this study, qualitative and quantitative research methods were used together*."
TM1406	Incorrect use of concepts	"*The method used in this study was the survey model, which is one of the quantitative analysis methods*."
TM1902	Misconception	"*Descriptive research, interview and survey method were used in this study*."
TM1903	Incorrect use of concepts	*"This study was conducted with the qualitative research method… the Interview technique, one of the descriptive research techniques, was used in this study."*
TM1904	Incorrect use of concepts	*"Document analysis method, one of the qualitative research models, was used in this study."*

When the statements in Table 15 were examined, it was seen about the methodological mistakes that the method heading in some theses did not reflect the content of the method. For example, in some theses, the research method was not clearly stated. Research methods based on different paradigms were not used to form a logical whole. While this is a scientifically important problem, it may also cause serious confusion for the reader.
One of the methodological mistakes is confusion. In particular, there were theses in which qualitative and quantitative research methods were used for one another or mixed, qualitative and quantitative research methods and action research approaches were used together. Depending on this situation, it could be stated that the philosophical sub-structures and paradigms on which the research methods were based were not understood sufficiently. Because these theses were approved by the supervisor, the thesis monitoring committee and the jury, it may indicate serious problems likely to be experienced in the scientist training process.
Another methodological mistake was incorrect use of concepts. For example, document analysis is not a method but a qualitative data collection tool. The survey model is not a quantitative analysis method but a research method. Therefore, these mistakes may confuse readers and make it difficult to understand the methodological structure of the theses and may cause problems with the issues of validity, reliability and ethics in terms of the scientific nature of the theses.

Figure 2. Sampling mistakes

Figure 2 shows the sampling mistakes encountered in the theses examined. These are mistakes caused by "lack of explanation regarding the sampling method" and "choosing the wrong sampling method". Related examples can be seen in Table 16.

Table 16. Sample statements regarding the sampling mistakes

Code	Mistake	Sample Statement
TM1502	Choosing the wrong sampling method	*"The sample of the study was determined using the purposeful sampling method, one of probabilistic sampling methods."*
TM1302	Choosing the wrong sampling method	*"This is a case study, and the single survey model was used within the scope of qualitative research method... Cluster sampling and stratified random sampling, which are among the probabilistic sampling methods, were used together to determine the research sample."*
TM1011	Lack of explanation regarding the sampling method	*"For the selection of the participants, the courses and the classes that the supervisor was responsible for were considered. In this respect, the supervisor was teaching ... in the department of primary school teaching, and to conduct my thesis, I chose a class I knew before."*

When the statements in Table 16 were examined, it was seen in some of the theses that although they belonged to different paradigms, probabilistic and purposeful sampling methods were used together. In some studies, the type of sampling was not mentioned. It should also be pointed out that sampling mistakes negatively affect the scientific quality of the thesis.

The mistakes related to the data collection tool encountered in theses are given in Figure 3.

Figure 3. Mistakes related to the data tools

As shown in Figure 3, the mistakes made regarding the data collection tool in the theses arose from the incorrect use of concepts and from misconception. Sample statements regarding these mistakes are shown in Table 17.

Table 17. Sample statements regarding the mistakes related to the data collection tools in the theses

Code	Mistake	Sample statement
TM1012	Incorrect use of concepts	*"A critical thinking inventory was developed by the researcher and finalized by taking the opinions of experts …*"
TM1303	Misconception	"*The study was carried out by applying a questionnaire according to the qualitative research model and by using the survey method according to the quantitative research model*."

TM1407	Misconception	"*The study was conducted using the descriptive research design based on the survey model*."
TM1802	Incorrect use of concepts	*"In the study, … the course book of … taught at primary school 4th grade level and the coursebook of … taught at the same level were used as the data collection tool."*

According to Table 17, in some of the theses, there were mistakes regarding the incorrect use of concepts and misconception concerning the data collection tools. For example, the coursebook, which is a data source, was presented as a data collection tool. Besides, according to the literature, the "a questionnaire-based survey model" is not one of the research models. In fact, the questionnaire is not a research type but a data collection tool. In this respect, as it can be understood from the statements in the theses, both misconception and incorrect use of concepts were encountered concerning data collection tools in some theses. Therefore, making incorrect/incomplete/inappropriate interpretation and definition of concepts and making mistakes due to interchangeable use of these concepts bring about the need for revising the methodological structures in theses.

Content-related mistakes made in the theses can be seen in Figure 4.

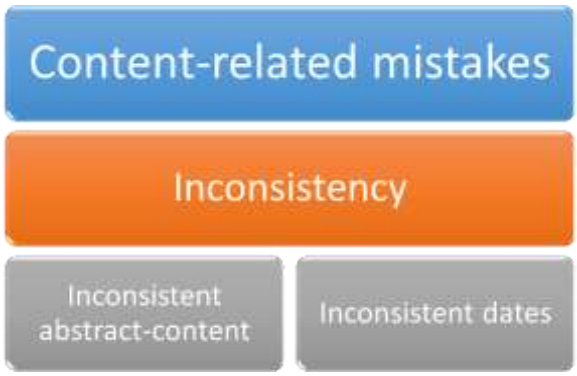


Figure 4. Content-related mistakes

As can be seen in Figure 4 content-related mistakes encountered in the theses were based on "incompatibility". Related examples are given in Table 18.

Table 18. Sample statements regarding content-related mistakes

Code	Mistake	Sample statement
TM1905	Abstract-content inconsistency	Abstract: "*In the introduction part of the study, 'thesis title', 'problem statement', 'problem situation', 'research purpose', 'importance of the research' and the method used in the study are presented. Information was given about '...' in the first section, about '...'. Education' in the second section, and about '... Books" in the third section, and the necessary subheadings were classified. The fourth section included the findings obtained and the related evaluations. The research results were presented in the last section, and the related suggestions were put forward*."
TM1206	Abstract-content inconsistency	Abstract: The thesis study included "introduction" and the "first", "second", "third" and "conclusion" sections after the introduction. At the end of the study, the references, which we *directly or indirectly benefitted from, were presented*."
TM1705	Abstract-content inconsistency	Abstract: "*In this study, which was carried out using the quasi-experimental design without a pretest-posttest control group, …"* Method: "*In this study, the mixed research method, which included qualitative and quantitative research techniques, was used*."
TD1402	Abstract-content inconsistency	Abstract: "*The real experimental model with a pretest-posttest control group was used*." Method: "*The study was designed using the mixed method*."
TM1013	Abstract-content inconsistency	Abstract: *"This was a quantitative study regarding the analysis techniques. For the analysis of the data, frequencies and percentages were calculated to determine the opinions of teachers and students.*" Method: "*In this study, the qualitative research method was applied*."

TM1607	Inconsistent dates	"The study group of the study included individuals who completed the program of … between 2009-2010 ..."

According to Table 18, mistakes related to "inconsistencies" such as "abstract-content inconsistency" and "inconsistent dates " were striking. Regarding the "abstract-content inconsistency", one could say that in some of the theses the things mentioned under the heading "abstract" do not overlap with those mentioned under the heading "method". Furthermore, there were theses where the abstract did not reflect the content of the research. It was seen that in terms of "inconsistent dates", there were theses based on the data collected 6-7 years ago. Accordingly, it could be stated that a thesis prepared based on an up-to-date topic is based on "up-to-date data" determines the actuality and functionality of the information produced. However, some of the theses could be said to lack such up-to-datedness.

Generally speaking, both master's and doctoral theses included these mistakes. The mistakes encountered in the theses did not just negatively affect the scientific quality of the theses; besides, it could be thought that academicians, who produce scientific information and train scientists, should revise their knowledge, skills and scientific understanding.

Conclusion, Discussion and Suggestions

This study aimed to reveal the bibliometric and content-related features and problems of master's and doctoral theses on classroom education in Turkey between 2010 and 2019. In line with this purpose, the results of the study are given by comparing them with the results obtained in similar studies in the literature.

Among the 1083 postgraduate theses examined within the scope of the study, 956 were master's theses and 127 were doctoral theses. It was seen that the number of master's theses was considerably higher than that of doctoral theses. In similar studies, the number of doctoral theses was less when compared to that of master's theses (Bağcı, 2012; Doğan, 2018; Küçükoğlu & Ozan, 2013; Şahin et.al., 2013; Tavşancıl, et.al., 2010). There might be different reasons for this situation. These reasons could be the long duration of the doctoral process, the involvement in the doctoral process of those who want to become academics, the failure of universities to create the conditions for opening a doctoral program in the field of teaching pedagogy, the personal, family and institutional problems of those who want to do it but cannot (denial of permission, erection of obstacles, refusal to reduce the workload, lack of legal infrastructure between institutions, etc.).The research results revealed that the research method mostly preferred in the theses was the quantitative research method. It was seen that the most frequent research type among quantitative research types was the survey and experimental model. In this respect, similar results were obtained in studies examining the studies carried out in the field of education (Bıkmaz et.al., 2013; Chen & Hirschheim, 2004; Karadağ, 2010; Koşar et.al., 2017; Kurtoğlu & Seferoğlu, 2013; Lee, Tien & Tsai, 2019; Polat, 2010; Şenyurt & Özkan-Özer, 2017; Topsakal, Çalık & Çavuş, 2012). In the theses where qualitative research methods were preferred, case study and phenomenological methods were used extensively. The reason why quantitative research methods were preferred more in the theses could be the fact that the process of data collection reaches more people in a shorter time and that the process of data collection and analysis is more time-consuming and tedious in qualitative research methods (Kozikoğlu & Senemoğlu, 2015).. Although quantitative research methods were mostly preferred in postgraduate theses, it was seen that there was an increase in the theses where qualitative research methods were preferred (Tereci & Bindak, 2019). In addition, methods such as mixed method and meta-analysis were preferred as well. Apart from these, there were theses in which different methods such as analytical model, methodological evaluation and design-based research were used. Preference of different methods in the theses could be considered important in obtaining, producing and spreading new, diverse and good-quality scientific information and offering new perspectives to different fields and studies. Concerning this, it could be stated that different methods, especially quantitative and qualitative methods, were used in the theses examined. Use of other methods in theses may ensure production of diverse and good-quality scientific information, yet it might be important that the research topic of the thesis is in integrity with the method used in the thesis.

In the theses examined within the scope of the study, it was seen that students were the most preferred source of data. Moreover, there are also theses conducted with teachers and preservice teachers. This result was obtained in similar studies (Doğan, 2018; Ergun & Çilingir, 2013; Koç, 2016; Tereci & Bindak, 2019). Therefore, the fact that students, teachers and preservice teachers, who are the main stakeholders in classroom education, were the most frequent data sources could be said to be a correct choice. However, it is important to increase the number of studies conducted with parents, school administrators and academicians, who are among other stakeholders.

Among the theses examined, there were also theses in which students taking secondary school education and individuals taking mass education, who are not direct stakeholders of classroom education, were included as data sources. This situation can be evaluated in terms of contributing to classroom education. On the other hand, theses to be conducted on classroom education in the context of the institution, individuals and the topic covering the

field of classroom education are important in terms of reflecting the problems, developments, existing situations and practices in the field.

In the theses examined, "scale", one of the quantitative data collection tools, was used most, and the same result was obtained in similar studies (Akpunar, Kazu & Erdamar, 2018; Arık & Türkmen, 2009; Eryılmaz & Deniz, 2019; Eskici & Çayak, 2017; Karadağ, 2010; Kozikoğlu & Senemoğlu, 2015; Kurtoğlu & Seferoğlu, 2013; Şahin, 2019; Wassink & Sadi, 2016). This situation could be a natural result of using quantitative research approaches as a method most. The scale was preferred most among the data collection tools might be studying topics related to the development of cognitive features such as achievement and skills of students or preservice teachers, who are sources of data. It may also be related to reaching more people through quantitative data collection tools and the economic process of data collection in terms of implementation time and implementation costs (Sert et.al., 2012). In the theses based on the qualitative research approach, it was seen that the interview method as a data collection tool was used most. This result is similar to the one obtained in a study examining theses on Turkish Language education (Boyacı & Demirkol, 2018). In addition, more than one data collection tool in some theses were used. This situation could be considered important in providing data richness, validity, and reliability. In this respect, it is important that thesis authors be aware of and be encouraged to use more than one data collection tool in thesis studies.

It was noted that the theses focused mainly on the course of Turkish language (including the teaching of reading and writing), as well as courses such as mathematics, science, social sciences and social life. The postgraduate theses on classroom education could be said to be related to the basic courses taught at elementary school level. This situation was also noted in the results of other similar studies (Bağcı, 2012; Bektaş, Dündar & Ceylan, 2013; Doğan, 2018; Şahin et.al., 2013; Ünal & Arık, 2016). However, it was revealed that the number of theses on fine arts, Physical Education and Playing, and Music was low. The reasons for the low number of postgraduate theses related to these courses, which are important for the affective development of elementary school students could be said to include the followings: the postgraduate theses related to these courses were low in number; the weekly course hours of these courses were low in number; not enough importance was given to these courses; these courses lacked acceptance in national and international exams; there were few experts/academicians to teach these courses in the field of classroom education; and the courses were not popular among postgraduate students.

When the postgraduate theses were examined concerning their topics, it was seen that most of the theses were conducted on education management. There were also theses on educational policies such as in-service training, special education, teacher training, elementary school curricula and laws. It could be stated that these topics were related to classroom education. This situation was also reflected upon other similar studies (Eskici & Çayak, 2017; Fazlıoğulları & Kurul, 2012; Şahin, Göğebakan-Yıldız & Duman, 2010; Tereci & Bindak, 2019; Tezcan-Apak & Güllühan-Ütkür, 2019). Studying different topics in the field of classroom education could guide further research in terms of the future of the field.

As a result of the research, it was revealed that there were various mistakes made in theses examined. These mistakes were in the method part of the theses as follows: incompatible content, misconception, incorrect use of concepts, and lack of explanation regarding the sampling method. This situation was also reported in other similar studies (Bacanak et.al., 2011; Bağcı, 2012; Ergun & Cilingir, 2013; Karadağ, 2009; Koşar et.al., 2017; Oruç & Ulusoy, 2008; Saban et.al., 2010; Şahin et.al., 2013; Tosuntaş, Emirtekin & Süral, 2019). Strikingly, there were content and methodological mistakes in some of the theses. There might be various reasons for this situation such as insufficient quality of scientific methodology courses during postgraduate education, lack of knowledge and skills of the student writing the thesis about scientific research, lack of knowledge and skills of thesis supervisors and jury members about the methods and techniques, and lack of detailed examination of theses before the thesis defense. In today's world where we can directly access information, making obvious mistakes in theses reduces the quality of the thesis and therefore the reliability of the information produced. To eliminate the mistakes that arise in theses, the literature on the thesis topic should be reviewed well; and scientific articles should be read especially during postgraduate courses so that students can master the scientific paradigms and methodologies; and precautions should be taken to minimize the mistakes as the thesis supervisor follows the process of the thesis preparation. Assuming that individuals who become expert in the field by completing their theses will produce scientific information, develop theories, give lectures and contribute to the training of new scientists through thesis consultancy in future, minimizing these problems should be considered important.

Some measures could be taken to increase the quality of the theses conducted in the field of classroom education. Postgraduate education in classroom education could be strengthened; the number of doctoral programs could be increased; and postgraduate students could be encouraged to choose topics related to their thesis subjects and study on more original topics. In addition, elementary school teachers could be encouraged to take postgraduate education so that new scientific information in the field of classroom education can be produced; new field experts can be trained; theory and practice can be combined; and the number of postgraduate theses can be increased. However, to facilitate these processes and related permissions, legal infrastructures could be strengthened (permission, adjustment of work load, direct contribution to salary and career development, etc.), and transforming this process into a policy - in the context of classroom education – will lead to an increase in qualified manpower

in the country in the medium and long term. In this respect, for better-quality theses, instructors who supervise theses could manage the process more carefully, and a "thesis monitoring committee" could be required during the master's thesis process.
This study was carried out using a systematic research approach for detailed examination of postgraduate theses in the field of classroom education. To conduct in-depth examination of postgraduate theses, theses related to special topic in the field of classroom education could be examined in-depth, and meta-synthesis studies could be conducted to obtain more information about the nature of theses.

Acknowledgements or Notes

A part of this study was orally presented in 5th World Conference on Educational and Instructional Studies in Antalya.

Authors Contribution Rate

The authors contributed equally to the study.

Conflicts of Interest

No potential conflict of interest was reported by the authors.

Ethical Approval

Ethical permission (07.01.2021-2021-06) was obtained from Usak University's Social and Humanities Sciences Ethics Commitee for this research.

References

Akpunar, B., Kazu, Y. İ. & Erdamar, S. F. (2018). Sınıf öğretmenleri ve sınıf öğretmen adayları üzerine yapılmış doktora çalışmalarının incelenmesi [Investigation of doctoral studies on classroom teachers and class teacher candidates]. *Elektronik Sosyal Bilimler Dergisi, 17*(67), 913-925.

Alper, A. & Gülbahar, A. (2009). Trends and ıssues in educational technologies: A review of recent research in TOJET. *The Turkish Online Journal of Educational Technology. TOJET, 8*(2), 124-135.

Andrews, R. & Harlen, W. (2006). Issues in synthesizing research in education. *Educational Research, 48*(3), 287-299.

Anılan, H., Anagün, S. Ş., Anılan, B., Atalay, N. & Kılıç, Z. (2018). Sınıf öğretmenliğindeki güncel eğilimler: Eğitim fakültesi dergilerinde yayımlanan çalışmaların incelenmesi [Current trends in primariy school education: Studies published in the journals of faculties of educational science carried out in the field of primary-school teacher]. *Pegem Eğitim ve Öğretim Dergisi, 8*(3), 503-530.

Arık, S. R. & Türkmen, M. (2009). Eğitim bilimleri alanında yayımlanan bilimsel dergilerde yer alan makalelerin incelenmesi [Investigation of articles published in the academic journals] *I. Uluslararası Türkiye Eğitim Araştırmaları Kongresi, Çanakkale Onsekiz Mart Üniversitesi, Antalya.*

Aydın, A. & Uysal, Ş. (2011). Türkiye'de ve yurt dışında eğitim yönetimi alanında yapılan doktora tezlerinin konu, yöntem ve sonuçları açısından değerlendirilmesi [Investigation of dissertation in the field of educational administration supervision planning and economics in Turkey]. *Eurasian Journal of Educational Research, 42,* 1-14.

Bacanak, A., Değirmenci, S., Karamustafaoğlu, S. & Karamustafaoğlu, O. (2011). E-dergilerde yayınlanan fen eğitimi makaleleri: Yöntem analizi. [Science articles published in E-jorunal: Analysis of method]. *Türk Fen Eğitim Dergisi, 8*(1), 119-132.

Bağcı, Ş. (2012). *Sınıf Öğretmenliği lisansüstü tezlerinin karakteristik özellikleri: Tematik, metodolojik ve istatistiksel yönelimler* [Characteristic features of elementary education dissertations: Thematic, methodological and statistical trends]. (Yayımlanmamış yüksek lisans tezi), Eskişehir Osmangazi Üniversitesi, Eskişehir.

Bahçeci, F. & Uşengül, L. (2018). Yüksek lisans ve doktora öğrencilerinin tez konusu belirleme kriterlerinin incelenmesi [Examination of thesis subject determination criteria of postgradue and doctorate students]. *Turkish Journal of Educational Studies, 5*(2), 85-96.

Baki, A., Güven, B., Karataş, İ., Akkan, Y. & Çakıroğlu, Ü. (2011). Trends in Turkish Mathematics Education Research: From 1998 to 2007. *Hacettepe Üniversitesi Eğitim Fakültesi Dergisi, 40,* 57-68.

Baskan, A. G. (2001). Türkiye'de yükseköğretimin gelişimi [Development of the higher education in Turkey]. *Gazi Üniversitesi Eğitim Fakültesi Dergisi, 21*(1), 21-32.

Bektaş, M., Dündar, H. & Ceylan, A. (2013). Ulusal Sınıf Öğretmenliği Eğitimi Sempozyumu (USOS) bildirilerinin çeşitli değişkenler açısından incelenmesi [Investigation of several variablaes papers national classroom teacher education symposium]. *Uşak Üniversitesi Sosyal Bilimler Dergisi, 6*(2), 197-222.

Bengtsson, M. (2016). How to plan and perform a qualitative study using content analysis? *NursingPlus Open,* 2, 8-14.

Bıkmaz F. H., Aksoy, E., Tatar & Ö. Altınyüzük, A. C. (2013). Eğitim programları ve öğretim alanında yapılan doktora tezlerine ait içerik çözümlemesi. [The content analysis of Phd theses completed in the field of curriculum and instruction]. *Eğitim ve Bilim, [Education and Science], 38* (168), 288-303.

Boyacı, S. & Demirkol, S. (2018). Türkçe eğitimi alanında yapılan doktora tezlerinin incelenmesi [An examination of doctoral dissertations in the field of teaching Turkish]. *Ana Dili Eğitimi Dergisi, 6*(2), 512-531.

Bozkaya, M., Aydın, E. İ. & Genç-Kumtepe, E. (2012). Research trends and issues in education technology: A content analysis of Tojet (2008-2011). *TOJET: The Turkish Online Journal of Educational Technology, 11*(2), 264-277.

Cafferella, E., P. (1999). *The major themes and trends in doctoral dissertation. Research in educational technology from 1997-1998. USA:* Department of Education Office of Educational Research and Improvement Educational Resources Information Center.

Çalık, M., Ünal, S., Çoştu, B., & Karataş, F. Ö. (2008). Trends in Turkish science education. *Essay in Education [Special education],* 24, 23-45.

Canbulat, T., Avcı, G. & Sipahi, S. (2016). ABD ve Kanada'da Sosyal Bilgiler eğitimi alanındaki tezlerin değerlendirilmesi [The evaluation of the theses in the field of social studies in the USA and Canada]. *Ahi Evran Üniversitesi Kırşehir Eğitim Fakültesi Dergisi, 17*(2), 351-370.

Can-Yaşar, M., & Aral, N. (2011). Türkiye'de okul öncesinde drama alanında yapılan lisansütü tezlerin incelenmesi [An overview of postgraduate theses within the field of drama at Early childhood education in Turkey]. *Mehmet Akif Ersoy Üniversitesi Eğitim Fakültesi Dergisi, 11*(22), 70-90.

Chang, H. Y., Chang, Y. C. & Tseng, H. Y. (2010). Trends of Science Education Research: An automatic content analysis. *J Sci Educ Technol,* 19, 315-331.

Çiltaş, A., Güler, G. & Sözbilir, M. (2012). Türkiye'de matematik eğitimi araştırmaları: bİr içerik analizi çalışması [Researches of Mathematic education in Turkey: A content analysis] *Educational Science: Theory & Practice, 12*(1), 565-580.

Cole, F.L. (1988). Content analysis: process and application. *Clinical Nurse Specialsit,* 2(1), 53-57.

Çoşkun, İ., Dündar, Ş. & Parlak, C. (2014). Türkiye'de özel eğitim alanında yapılmış lisansüstü tezlerin çeşitli değişkenler açısından incelenmesi (2008-2013) [The analysis of the postgraduate thesis written on special education in terms of various criteria in Turkey (2008-2013)]. *Ege Eğitim Dergisi, 15*(2), 375-396.

Doğan, M. (2018). *Türkiye'de 2013-2017 yılları arasında Sınıf Eğitimi alanında yapılmış lisansüstü tezlerin incelenmesi* [Investigation of the postgraduate thesis written on primary school education]. (Yayımlanmamış yüksek lisans tezi), Gazi Üniversitesi, Ankara.

Doğru, M., Gençosman, T., Atalakın, N. A. & Şeker, F. (2012). Fen bilimleri eğitiminde çalışılan yüksek lisans ve doktora tezlerinin analizi. [Analysis of master and phd thesises researched on science education.] *Türk Fen Eğitimi Dergisi, 9*(1), 50-64.

Duria, J. V., Reger, K. R. & Pfarrer, M. (2007). A content analysis of the content analysis literature in organizations studies. *Organizational Research Methods, 10*(1), 5-35.

Elbir, B. & Bağcı, C. (2013). Birinci ve ikinci kademe okuma eğitimi üzerine yapılan lisansüstü çalışmaların değerlendirilmesi [The evaluation of graduate studies on teaching and second stage]. *Adıyaman Üniversitesi Sosyal Bilimler Enstitüsü Dergisi, 6*(11), 229-247.

Elo, S. & Kyngas, H. (2008). The qualitative content analysis process. *Journal of Nursing, 62*(1), 107-115.

Erdem, D. (2011). Türkiye'de 2005-2006 yılları arasında yayımlanan eğitim bilimleri dergilerindeki makalelerin bazı özellikler açısından incelenmesi: Betimsel analiz. [The analysis articles of various features published in journals of education science between years 2005-2006 in Turkey: Descriptive analysis] *Eğitimde ve Psikolojide Ölçme ve Değerlendirme Dergisi, 2*(1), 140-147.

Ergun, M. & Cilingir, F. (2013). *İlköğretim bölümünde yapılan tezlerin incelenmesi:* Ondokuz Mayıs Üniversitesi Örneği [Examining the thesesis published on primary education. Example of Ondokuz Mayıs University] VI. Ulusal Lisansüstü Eğitim Sempozyumu, Sakarya Üniversitesi, Sakarya. (85-89).

Eryılmaz, S. & Deniz, G. (2019). Türkiye'de programlama eğitimi ile ilgili yapılan çalışmaların incelenmesi: Bir betimsel analiz çalışması [Investigation of studies on programming education in Turkey: A descriptive analysis study]. *Journal of Theory and Practice in Education, 15*(4), 319-338.

Eskici, M. & Çayak, S. (2017). Eğitim bilimleri anabilim dalında yapılan yüksek lisans tezlerine genel bir bakış [An overview on master thesis conducted at the department of educational sciences]. *Trakya Sosyal Bilimler Dergisi, 19*(1), 211-216.

Fazlıoğulları, O. & Kurul, N. (2012). Türkiye'deki eğitim bilimleri doktora tezlerinin özellikleri [The characteristics of doctoral dissertations of educational sciences in Turkey] *Mehmet Akif Ersoy Üniversitesi Eğitim Fakültesi Dergisi, 12*(24), 43-75.

Fensham, P. J. (2004) *Defining an identity: The evolution of science education as a field of research.* Netherlands: Kluwer Academic.

Gaur, A. & Kumar, A. (2017). A systematic approach to conducting review studies: an assessment of content analysisin 25 yeras of IB reserarch. *Journal of World Business, 53* (2), 280-289.

Geçit, Y. & Kartal, A. (2010). Türkiye'de sosyal bilgiler eğitimi araştırma konuları üzerine bir inceleme [An examination on the subjects of researches on social studies education in Turkey] *International Conference on New Trends in Education and Their Implications.* (11-13 November), (101-107), Antalya.

Göktaş, Y., Hasançelebi, F., Varışoğlu, B., Akçay, A., Bayrak, N., Baran, M. & Sözbilir, M. (2012). Türkiye'de eğitim araştırmalarında eğilimler: Bir içerik analizi [Trends in educational research in Turkey: A content analysis]. *Educational Sciences: Theory & Practice, 12*(1), 443-460.

Gömleksiz, N. M. & Bozpolat, E. (2013). Eğitim Programları ve Öğretim alanındaki lisansüstü tezlerin değerlendirilmesi. [Evaluation of postgraduate theses for educational programs and students] *The Journal of Academic Social Science Studies, 6*(7), 457-472.

HEC [Higher Education Council] (1981). *Yükseköğrenim Kanunu*. https://www.mevzuat.gov.tr/MevzuatMetin/1.5.2547.pdf.

HEC [Higher Education Council] (1996). *Lisansüstü Eğitim Yönetmeliği*. 01. 07. 1996 tarihli ve 22683 sayılı Resmi Gazete. http://www.uak.gov.tr/yonetmelikler/lusinav.pdf.

İncekara, S. (2009). The international research in Geography Education and the examples from Turkey: Present situation and future directions. *Doğu Coğrafya Dergisi,* 21, 123-136.

İnceoğlu, G. (2009). Matematik eğitimi ve matematik öğretimi alanında yapılan tezlerin bir değerlendirilmesi *[*An evaluation of the theses published in the field of mathematics education and mathematics teaching]. *E-Journal of New World Sciences Academy, 4(3),*1046-1052.

Ion, G. & Iucub, R. (2016). The impact of postgraduate studies on the teachers'practice. *European Journal of Teacher Education, 39*(5), 602-615.

Kapkın, B., Çalışkan, Z. & Sağlam, M. (2018). Türkiye'de 1999-2017 yılları arasında değerler eğitimi alanında yapılmış lisansüstü çalışmaların incelenmesi [Examination of postgraduate theses in the field of values education in Turkey between 1999-2007]. *Değerler Eğitimi Dergisi, 16*(35), 185-209.

Karadağ, E. (2009). Eğitim bilimleri alanında yapılmış doktora tezlerinin tematik açıdan incelenmesi [A thematic analysis on doctoral dissertations made in the area of education sciences]. *Ahi Evran Üniversitesi Eğitim Fakültesi Dergisi, 10*(3), 75-87.

Karadağ, E. (2010). Eğitim bilimleri doktora tezlerinde kullanılan araştırma modelleri: Nitelik düzeyleri ve analitik hata tipleri [Resarch models used in doctoral dissertations in the area of education sciences in Turkey: Quality of research and analytical errors]. *Educational AdministrationTheory and Practice, 16* (1), 49-71.

Karamustafaoğlu, O. (2009). Fen ve Teknoloji eğitiminde temel yönelimler [Main trends on science and technology education]. *Kastamonu Education Journal, 17*(1), 87-101.

Koç, S. E. (2016). Türkiye'de ilköğretim programlarının değerlendirilmesine yönelik yapılan lisansüstü tezlerinin incelenmesi [Examination of postgraduate theses on the evaluation of primary education programs in Turkey]. *Abant İzzet Baysal Üniversitesi Eğitim Fakültesi Dergisi, 16*(1), 198-216.

Koşar, D., Er, E., Kılınç, Ç. A. & Koşar, S. (2017). Öğretmen liderliğine ilişkin yapılan çalışmaların incelenmesi: Bir içerik analizi çalışması [Analysis of teacher leadership studies: A content analysis study]. *İnönü Üniversitesi Eğitim Bilimleri Enstitüsü Dergisi, 4*(7), 30-46.

Kozikoğlu, İ. & Senemoğlu, N. (2015). Eğitim Programları ve Öğretim alanında yapılan doktora tezlerinin içerik analizi (2009-2014) [The content analysis of dissertations completed in the field of curriculum and instruction (2009-2014)] *Education and Science, 40*(182), 29-41.

Krippendorff, K. (2019). Content analysis an introduction to its methodology. USA: Sage.

Küçükoğlu, A. & Ozan, C. (2013). Sınıf Öğretmenliği alanındaki lisansüstü tezlere bir içerik analizi. [A content analysis master theses and dissertations in classroom teacher education] *Uluslararası Avrasya sosyal Bilimler Dergisi, 4*(12), 27-47.

Küçüközer, A. (2016). Fen Bilgisi eğitimi alanında yapılan doktora tezlerine bir bakış [An overview of the doctoral thesis in science education]. N*ecatibey Faculty Education Electronic Journal of Science and Mathematics Education, 10*(1), 107-141.

Kurt, A. & Erdoğan, M. (2015). Content analysis and trends of curriculum evaluation: 2004-2013. *Education and Science, 40*(178), 199-224.

Kurtoğlu, M. & Seferoğlu, S.S. (2013). Öğretmenlerin teknoloji kullanımı ile ilgili Türkiye kaynaklı dergilerde yayımlanmış makalelerin incelenmesi [Examination of studies conducted on teachers' technology usage published in Turkish journals]. *Journal of Instruction Technologies & Teacher Education, 2*(3), 1-10.

Lee, H. M., Ying –Tien W. & Tsai, C. C. (2009). Research trends in science education from 2003 to 2007: A content analysis of publications in selected journasl. *International Journal of Science Education*, *31*(15), 1999-2020.

Mortimore, P. (2000). Does educational research matter? *British Educational Research Journal, 26*(1), 1-20.

Oruç, Ş. & Ulusoy, K. (2008). Sosyal Bilgiler öğretimi alanında yapılan tez çalışmaları [Social studies education and dissertations in this field]. *Selçuk Üniversitesi Ahmet Keleşoğlu Eğitim Fakültesi Dergisi,* 26, 121-132.

Özenç, M. ve Özenç, E. G. (2013). Sınıf öğretmenleri ile yapılan lisansüstü eğitim tezlerinin yöntem bölümü açısından incelenmesi [Examination of postgraduate method section made dissertations with primary school teacher]. *Abant İzzet Baysal Üniversitesi Eğitim Fakültesi Dergisi, 13*(1), 132-141.

Özkaya, A. (2019). Bibliometric anlaysis of the publications made in STEM education area. *Bartın University Journal of Faculty of Education, 8*(2), 590-628.

Polat, G. (2010). *Eğitim Yönetimi ve Denetimi anabilim dalında yapılmış lisansüstü tez çalışmalarının incelenmesi*. [Examination of postgraduate thesis studies in the department of educational administration and supervision] (Yayımlanmamış yüksek lisans tezi), Maltepe Üniversitesi, İstanbul.

Prassad, B. D. (2008). Content analysis a method in social science research. In D. K. Lal Das and V. Bhaskaran (Eds.), *Research methods for social work* (pp 173-193). New Delhi: Rawat.

Saban, A., Koçbeker, N. B., Saban, A., Alan, S. Doğru, A., Ege, İ., Arslantaş, S., Çımar, D. & Tunç, P. (2010). Eğitimbilim alanında nitel araştırma metodolojisi ile gerçekleştirilen makalelerin analizi [An analysis of education articles conducted bt the qualitative research methodology]. *Selçuk Üniversitesi Ahmet Keleşoğlu Eğitim Fakültesi Dergisi, 30,* 125-142.

Şahin, A. (2019). *2008-2018 yılları arasında Sınıf Öğretmenliği alanında yapılan çalışmaların incelenmesi* [Examination of the studies conducted in the field of classroom teaching between 2008-2018]. (Yayımlanmamış yüksek lisans tezi), Trabzon Üniversitesi, Trabzon.

Şahin, D., Calp, Ş., Bulut, P. & Kuşdemir, Y. (2013). Sınıf öğretmenliği eğitimi bilim dalında yapılmış lisansüstü tezlerin çeşitli kriterlere göre incelenmesi [Investigation of the graduate theses in the department of primary teacher education in terms of various criteria]. *Zeitschrift für die Welt der Türken Journal of World of Turks, 5*(3), 187-205.

Şahin, M., Yıldız Göğebakan, D. & Duman, R. (2011). Türkiye'deki Sosyal Bilgiler eğitimi tezleri üzerine bir değerlendirme [An evaluation of the theses on social studies education in Turkey]. *Journal of Social Studies Education Research, 2*(2), 96-121.

Şenyurt, S. & Özkan-Özer, Y. (2017). Eğitimde ölçme ve değerlendirme alanında yapılan yüksek lisans tezlerinin tematik ve metodolojik açısından incelenmesi [A thematic and methodological analysis of master's dissertations in the field of measurement and evaluation in education]. *İlköğretim Online, 16*(2), 628-653.

Sert, G., Kurtoğlu, M., Akıncı, A. & Seferoğlu, S. S. (2012). *Öğretmenlerin teknoloji kullanma durumlarını inceleyen araştırmalara bir bakış: Bir içerik analizi çalışması* [An overview of research examining teachers' technology use: a content analysis study]. Akademik Bilişim, 1-3 Şubat 2012, Uşak Üniversitesi.

Şimşek, A., Özdamar, N., Becit, G., Kılıçer, K., Akbulut, Y. & Yıldırım, Y. (2008). Türkiye'deki eğitim teknolojisi araştırmalarında güncel eğilimler [Current trends in educational technology research in Turkey]. *Selçuk Üniversitesi Ahmet Keleşoğlu Eğitim Fakültesi Dergisi, 32,* 391-410.

Soslu, Ö. (2013). Türkiye'deki fizik eğitimi araştırmalarında genel eğilimler. [Trends in physics education research in Turkey] *Yüzüncü Yıl Üniversitesi Eğitim Fakültesi Dergisi, 10*(1), 201-226.

Tarman, B., Güven, C. & Aktaşlı, İ. (2011). Türkiye'de sosyal bilgiler eğitimi alanında yapılan doktora tezlerinin değerlendirilmesi ve alana katkıları [The evaluation of phd theses prepared in the field of social studies education and their contrubition to the field in Turkey]. *Selçuk Üniversitesi Ahmet Keleşoğlu Eğitim Fakültesi Dergisi, 32,* 391-410.

Taş, M. A. & Özkaral, C. T. (2015). Analysis of the post-graduate theses on the subject of quality in the field of education. *The Online of Quality Higher Education,* 2(2), 1-9.

Tavşancıl, E., Çokluk, Ö., Çıtak, G. G., Kezer, K., Yıldırım, Y., Bilican, S., Büyükturan, B. E., Şekercioğlu, G., Yalçın, N., Erdem, D. & Özmen, D. T. (2010). *Eğitim bilimleri enstitülerinde tamamlanmış lisansüstü tezlerinin incelenmesi* [The investigation of theses completed at the ınstitutes of educational sciences (2000-2008)]. Bilimsel Araştırma Projesi Kesin Raporu. https://dspace.ankara.edu.tr/xmlui/bitstream/handle/20.500.12575/68960/Binder1.pdf?sequence=1&isAllowed=y.

Tereci, A. & Bindak, R. (2019). 2010-2017 yılları arasında Türkiye'de matematik eğitimi alanında yapılan lisansüstü tezlerin incelenmesi [Comparative analysis pf post-graduate theses conducted between the years 2010-2017 in the field of mathematics education in Turkey according to certain standards]. *MSKU Eğitim Fakültesi Dergisi, 6*(1), 40-55.

Tezcan-Apak, Ö. & Güllühan-Ütkür, N. (2019). Türkiye'de Hayat Bilgisi dersine yönelik yapılan çalışmaların incelenmesi. *Trakya Journal of Education, 9*(4), 742-756.

Topsakal, U. U., Çalık, M.ve Çavuş, R. (2012). What trends do Turkish biology education studies indicate? *International Journal of Environmental & Science Education, 7*(4), 639-649.

Tosuntaş, B. Ş., Emirtekin, E. & Süral, İ. (2019). Eğitim ve öğretim teknolojileri konusunda yapılan tezlerin incelenmesi (2013-2018) [Examination of theses on educational and ınstructional technologies (2013-2018)]. *Yükseköğretim ve Bilim Dergisi*, 9(2), 277-286.

Tsai, C. C. & Wen, L. M. (2005). Research and trends in science education from 1998 to 2002: A content analysis of publication in selected journals, international. *Journal of Science Education, 27*(1), 3-14.

Ünal, E. & Arık, S. (2016). Sınıf Öğretmenliği bilim dalında yapılan lisansüstü tezlere yönelik bir araştırma [A study on masters dissertations conducted in the field of primary school teaching]. *Turkish Studies, 11*(3), 2295-2332.

Wassink, K. F.& Sadi, Ö. (2016). Türkiye'de fen bilimleri eğitimi yönelimleri: 2005 ile 2014 yılları arasında bir içerik analizi. *İlköğretim Online, 15*(2), 594-614.

Weber, R. P. (1990). *Basic content analysis*.USA: SAGE.

Woods, D. M., Agarwal, S., Jones, D., Young, B. & Sutton, A. (2005). Synthesising qualitative and quantitative evidence: Are view of possible methods. *Journal of Health Services Research & Policy*, *10* (1), 45–53.

Yaşar, Ş. (1998). Çağdaş bilim anlayışı. G. Can (Ed.) *Çağdaş yaşam çağdaş insan* (pp. 155-160). Eskişehir: Anadolu Üniversitesi Açıköğretim Yayınları.

Yenilmez, K. & Sölpük, N. (2014). Matematik dersi öğretim programı ile ilgili tezlerin incelenmesi (2003-2013) [The examination of theses to relate with mathematics curriculum (2004-2013)]. *Journal of Research in Education and Teaching, 3*(2), 2146-9199.

International Journal of Contemporary Educational Research (IJCER)

www.ijcer.net

Flipped Learning and Gamification in Information Technologies and Software Course

Gülseren Tarhan[1], Gülcan Öztürk[2]
[1]Ministry of National Education, 0000-0002-2493-6757
[2]Balıkesir University, 0000-0003-4399-1329

Article History
Received: 12.07.2021
Received in revised form: 17.01.2022
Accepted: 23.01.2022
Article Type: Research Article

To cite this article:

Tarhan, G., & Öztürk, G. (2022). Flipped learning and gamification in information technologies and software course. *International Journal of Contemporary Educational Research*, *9*(1), 62-77. https://doi.org/10.33200/ijcer.969959

International Journal of Contemporary Educational Research

Volume 9, Number 1, March 2022, 62-77 ISSN: 2148-3868

Flipped Learning and Gamification in Information Technologies and Software Course*

Gülseren Tarhan[1], Gülcan Öztürk[2]**
[1]Ministry of National Education
[2]Balıkesir University

Abstract

This study aims to determine the impact of flipped learning and gamification methods on student achievement in the subject of ethics and security, which is a topic of the fifth grade information technology and software course, compared to the traditional method. Also, it aims to decide the students' opinion of about the flipped learning and gamification methods. The study used a mixed-methods experimental design, included both quantitative and qualitative research designs. The study's quantitative strand focused on the non-equivalent groups pretest-posttest design and the qualitative strand based on the case study design. The study group consisted of 32 fifth-grade students from a secondary school in a city located in western Turkey. There were 16 students in the experimental group and 16 students in the control group. The ethics and security success test, which the researchers developed, was used for collecting quantitative data. The semi-structured interviews with the students in the experimental group were performed for qualitative data. The descriptive statistics and two-way analysis of variance for mixed measures were used to analyze the quantitative data and the content analysis method was used to analyze the qualitative data. According to the study results, the students in the experimental group were more successful than the students in the control group. The students expressed positive opinions about the flipped learning and gamification methods in the interviews.

Keywords: Flipped learning, Gamification, Information technologies and software course, Ethics and security, Students' success.

Introduction

Smart mobile devices, applications, various social media environments, driverless vehicles, drones, humanoid robots, and artificial intelligence products have all arisen because of technological advances in the twenty-first century. These technological advancements have brought many changes to people's lives, and technology has become an essential factor influencing people's lives. Because of this change, the education system is moving away from traditionalism for new generations to keep up with emerging changes, an understanding that puts students at the center, facilitates students' learning, and enables the use of technology in a learning environment (Şenel & Gençoğlu, 2003). Because of this understanding, new ideas have emerged in education and the use of alternative methods has become a necessity (Kotluk & Kocakaya, 2015). The main idea of alternative methods is that students are active while learning and the methods facilitate students' learning (Alsancak Sırakaya, 2017). Two of alternative methods are flipped learning and gamification.

Flipped learning method is referred to as flipped learning model, flipped classroom, flipped classroom model, flipped model, and flipped instruction in the literature. Flipped learning is defined as doing classroom activities at home and doing homework in the classroom (Bergmann & Sams, 2012). Subjects that need to be learned in the school in traditional education are given to students as homework, and tasks given as homework in traditional education are completed in the classroom when students come to school in the flipped learning model (Demiralay & Karataş, 2014; Karataş, 2014; Turan, 2015). With the flipped learning method, students are expected to engage in the classroom activities actively. The activities are structured to encourage students to adapt what they have learned to new circumstances, and the teacher serves as a guide. The aim is for students to understand the knowledge presented before the lesson and to achieve a high level of learning stages such as implementation,

* The study is an extended version of the oral presentations presented in 4th International Symposium of Turkish Computer and Mathematics Education (TURCOMAT) held on September 26-28, 2019 in Çeşme/İzmir, Turkey.

** Corresponding Author: *Gülcan Öztürk, ozturkg@balikesir.edu.tr*

analysis, and synthesis during the class periods in school (Hayırsever & Orhan, 2018; Kara, 2016). Subjects can be presented as videos, diagrams, and documents via online and offline platforms in the flipped learning method. Students may use their smart devices (i.e., phone, tablet, computer) to access these resources (Karadeniz, 2015). Lage, Platt, and Treglia (2000) established the theoretical foundation for the flipped learning method. Two chemistry teachers working at a high school in the United States videotaped their lecture presentations for the absent students for various reasons from their classes. They began publishing them on their website, which was the first application of flipped learning. With this application, the students easily accessed the lessons and watched the videos they want, so they knew the subject before they came to the class (Bergmann & Sams, 2012; Filiz & Kurt, 2015; Hayırsever & Orhan, 2018). In this way, the teachers built an interactive and active environment in the classroom by having the students do activities who came to the course with prior knowledge. The teacher's role changed and differentiated in this setting, and s/he became a learning coach (Bergmann & Sams, 2012). The flipped learning method has become increasingly widespread and new teaching model of the 21st century as it enables students to learn (Serçemeli, 2016). Chen, Wang, Kinshuk, and Chen (2014) state that flipped learning has seven pillars. These seven pillars are illustrated in Figure 1 (Wu, Hsieh, & Yang, 2017).

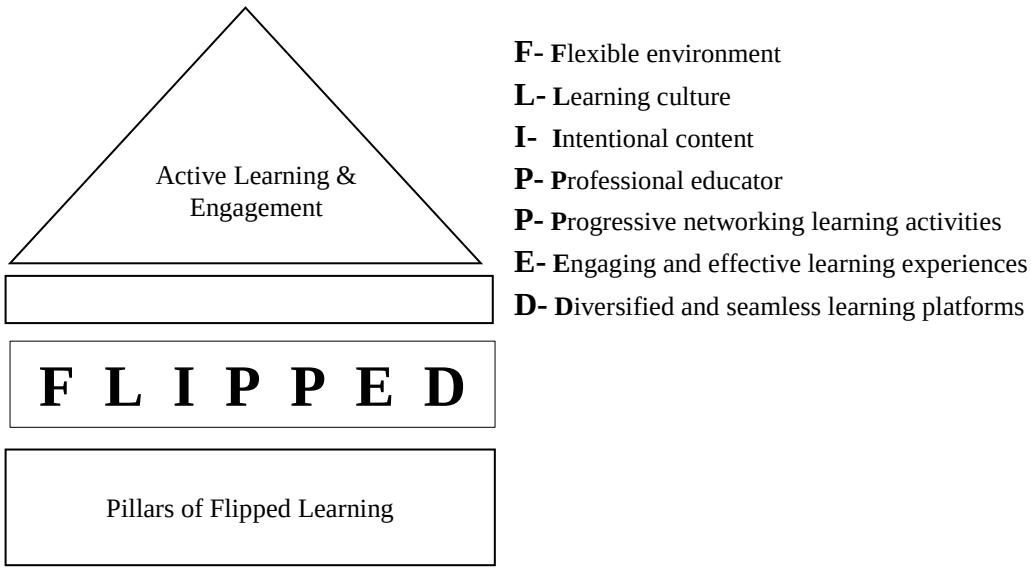


Figure 1. Seven pillars of Flipped Learning (Wu et al., 2017)

A flexible environment refers to a learning environment in which students can choose when and where they learn and an opportunity to learn at their own pace. ***Learning culture*** is that students learn according to their own learning styles and actively engage in the structuring of knowledge by assessing their own learning in the classroom. ***Intentional content*** is teachers' design of materials (written text, video or electronic) that students will examine and evaluate before coming to the classroom, with a student-centered approach to the subject to be learned. ***The professional educator*** has an important role in planning and arranging flipped learning content, developing the learning environment, effective observation of the learning process, and giving feedback to students. ***Progressive networking learning activities*** are sequential, interactive and online learning activities. Students gain knowledge outside of the classroom in different learning environments, evaluate their learning in the classroom, and reinforce what they have learned with their friends. ***Engaging and effective learning experiences*** are students' participation in effective learning activities in the classroom in an interaction focused on student autonomy. ***Diversified and seamless learning platforms*** integrate a learning environment with advanced online learning activities that students can access through Internet from any location and any time (Chen et al., 2014; Filiz & Kurt, 2015; Wu et al., 2017).

There are studies on teaching using the flipped learning method at various educational levels in the literature (Aydın, 2016; Boyraz, 2014; Çakır & Yaman, 2018; Demiralay, 2014; Fisher, LaFerriere, & Rixon, 2020; Gençer, 2015; Güç, 2017; Öztürk & Alper, 2019; Pierce & Fox, 2012; Sağlam, 2016; Su & Chen, 2018; Turan, 2015; Wu et al., 2017; Yavuz, 2016). Pierce and Fox (2012) used the flipped learning method in pharmacy education and examined how it affected students' success and attitudes. Students' performance on the final exam increased compared to students taught in a traditional classroom, and their opinions were positive (Pierce & Fox, 2012).

Boyraz (2014) found that the experimental group taught using the flipped learning method had higher academic achievement than the control group taught using the conventional method. Turan (2015) found that students taught using the flipped learning method had higher levels of success, motivation, and cognitive load than students taught using the conventional method, and that students had positive opinions about the flipped learning method. According to Yavuz (2016), there was no difference in success between the experimental group taught with flipped learning method and the control group taught with the conventional method, and the experimental group had positive opinions. Güç (2017) discovered that in the seventh-grade mathematics courses, there was a significant difference in the students' success in favor of the experimental group taught with flipped learning method, no significant difference in attitudes toward mathematics, and the students' and parents' opinions were positive. Çakır and Yaman (2018) concluded that the experimental group taught with flipped learning increased their science success while their computational thinking skills remained unchanged. The students taught with flipped learning method had higher academic performance, programming language self-orientation learning abilities, and computer attitudes than the students taught with the conventional method (Öztürk & Alper, 2019). Fisher et al. (2020) conducted semi-structured interviews with 19 university students taught with the flipped learning method. The study found that students have both positive and negative opinions about flipped learning method that flipped learning strategies influence and facilitate learning and that students' ability to complete the preparatory learning, which is flipped learning method's basic assumption, may be its weakness.

Gamification is a transition of game elements to non-game contexts and is one approaches that has enabled students to engage more effectively in-class (Deterding, Dixon, Khaled, & Nacke, 2011; Dominguez, Saenz-de-Navarrete, De-Marcos, Fernandez-Sanz, Pages, & Martinez-Herraiz, 2013; Kim & Lee, 2015; Lee & Hammer, 2011; Werbach & Hunter, 2012; Yıldırım & Demir, 2016). Game mechanics and game dynamics are two types of elements in games. Students are moved by game mechanics, such as points, prizes, teams, avatars, ranks, leaderboards, and badges. Feedback from game players, progress in game, relationships between players, in-game shopping, player collaboration, and game limitations are all examples of game dynamics (Aral, Gürsoy, & Köksal, 2001; Zichermann & Cunningham, 2011). Gamification, known as transferring of game elements to non-game environments, is a popular method for increasing students' participation in class (Hanus & Fox, 2018). It was observed that individuals worked harder to achieve their goals and got the game elements they wanted in environments where the gamification method was used. It was stated that the gamification method enables all students to engage actively in-class activities (Lee & Hammer, 2011; Mert & Samur, 2018; Sezgin, Bozkurt, Yılmaz, & Van der Linden, 2018).

There are studies on the gamification method at various educational levels in the literature (Ar, 2016; De-Marcos, Dominguez, Saenz-de-Navarrete, & Pages, 2014; Dominguez et al., 2013; Hanus & Fox, 2018; Li, Dong, Untch, & Chasteen, 2013; Lister, 2015; Mert & Samur, 2018; Meşe, 2016; Mohammed, 2018; Öztürk & Korkmaz, 2020; Türkmen, 2017; Yapıcı & Karakoyun, 2017; Yıldırım, 2016, 2017; Yıldırım, 2018; Yıldırım & Demir, 2016). The experimental group taught with the gamification method had higher performance scores than the control group in the study conducted by Ar (2016). In addition, the students' use of learning strategies improved in the study. Türkmen (2017) investigated the effects of the gamification method on mathematics courses on the fifth-grade students' success and attitudes. According to the results, the experimental group's success improved as compared to the control group, and there was no significant difference between the experimental and control groups' success and attitude scores. According to Yapıcı and Karakoyun (2017), the pre-service teachers' opinions about the use of Kahoot, a gamification application, were positive, and Kahoot increased the pre-service teachers' motivation levels. Mert and Samur (2018) evaluated and interpreted the students' opinions about gamification elements (avatar, feedback, score, reward, progress table) in terms of motivation and game elements. Yıldırım (2018) investigated the effect of the gamification method on the students' success in the social studies course. The researcher concluded that there was no statistically significant difference between the experimental and control group's success scores and that the gamification method drew the students' attention.

There are also studies in the literature that use the flipped learning and gamification methods together in the teaching, and the results demonstrate that the flipped learning and gamification methods are successful (Alsancak Sırakaya, 2017; Gómez-Carrasco, Monteagudo-Fernández, Moreno-Vera, & Sainz-Gómez, 2020; Gündüz & Akkoyunlu, 2020; Huang & Hew, 2018; Huang, Hew, & Lo, 2018; Hung, 2018; Lai & Foon, 2019; Lo & Hew, 2020; Matsumoto, 2016; Özer, Kanbul, & Ozdamli, 2018; Parra-González, López-Belmonte, Segura-Robles, & Moreno-Guerrero, 2021; Pozo Sánchez, López Belmonte, Fuentes Cabrera, & López Núñez, 2020; Sailer & Sailer, 2021; Segura-Robles, Fuentes-Cabrera, Parra-González, & López-Belmonte, 2020; Thongmak, 2019; Zainuddin, Shujahat, Chu, Haruna, & Farida, 2019; Zou, 2020). Matsumoto (2016) used the flipped learning and gamification method in English teaching. Teaching with the flipped learning and gamification methods successfully improved students' understanding and motivation in the study. Alsancak Sırakaya (2017) concluded that the first-year students in the preschool education department had positive opinions about the gamified flipped classroom model.

Özer et al. (2018) concluded that most pre-service teachers were pleased with the gamification supported flipped classroom activities and an increase in classroom competitiveness and motivation. Huang et al. (2018) found that university students taught with gamification-enhanced flipped learning method were more likely to complete pre- and post-classroom tasks on time than students who taught with non-gamified flipped learning method. The gamification-enhanced flipped learning group's pre-classroom thinking practices were higher, and the group got a higher score on the post-test than the non-gamified flipped learning group. Thongmak (2019) investigated and compared the effectiveness of flipped learning and gamification methods. The study found that these methods were effective in changing students' perceptions of usefulness and participation intentions. Compared to the flipped learning method, the gamification method provided better results regarding participants' viewpoints. Sailer and Sailer (2021) used gamified flipped classroom model with the educational science students in their experimental research. The results indicated that gamified activities positively affected social relatedness and intrinsic motivation, but no significant effect on competence need satisfaction.

It is expected that the teaching methods like flipped learning and gamification methods that have emerged in recent years will provide students with a novel experience and opportunity to learn with fun. These new methods may allow the Information Technologies and Software [ITS] course to be taught more effectively. There has been no study about the use of flipped learning and gamification methods in teaching the ITS course in the literature. Because the Ethics and Security subject of the fifth-grade ITS course is an abstract subject, it was decided to use flipped learning and gamification methods to teach the Ethics and Security subject. The flipped learning method aims to allow students to learn at their own pace using virtual platforms at their home and the gamification activities aim to reinforce students' learning instead of teaching an abstract subject verbally in the classroom. For all the reasons mentioned above, the study would contribute to the field of ITS teaching. The research question of the study is "What is the impact of flipped learning and gamification methods on student achievement in Ethics and Security subject compared to the conventional method and what are the opinions of students taught using flipped learning and gamification methods?" The following section describes the research method used to find a solution to this problem.

Method

Research Model

The research model was a mixed-methods experimental design because the study used both quantitative and qualitative data collection methods. In the mixed-methods experimental design, qualitative data is collected to support experimental study results to understand whether the intervention works and how it works (Creswell & Plano Clark, 2018; Kong, Mohd Yaacob, & Mohd Ariffin, 2018). The nonequivalent groups pretest-posttest design was used to collect the quantitative data for the analysis in the experimental strand (Büyüköztürk, Çakmak, Akgün, Karadeniz, & Demirel, 2014; Fraenkel & Wallen, 2012). In the nonequivalent group pretest-posttest design, dependent variable measurements are taken from two groups (experimental and control) determined before the application without using random assignment, and the dependent variables are measured again using the same form or co-form after the intervention. It is decided whether there is a significant difference between the two groups for the change observed in the dependent variable through data got before and after the experiment (Büyüköztürk et al., 2014; Fraenkel & Wallen, 2012). Random assignment was not possible because the experimental and control groups students were studying in two classes. The ethics and security success test was first given to both groups in the study. The students in the experimental group were taught with flipped learning and gamification methods. The conventional method, i.e. lecture method, was used to teach the subject in the control group. The subject was taught in both groups and at the end of the lesson the same success test was given in both groups. When the pre-test and post-test were administered, students were informed that the results of the tests would not affect their success in the ITS course. In addition, the case study design was used to gather qualitative data from the experimental group. A case study aims to analyze the process of an event, phenomenon, or situation in the research in depth, understand its effects, and reveal how the research participants are affected (Yin, 2003). Interview is one of the most common methods for determining what the participants' opinions are about the process in qualitative research (Yıldırım & Şimşek, 2013). The students in the experimental group were interviewed in semi-structured interviews for their opinions about the teaching methods.

Study group

The study group comprised 32 students enrolled in two different fifth-grade classes at a secondary school in a city located in western Turkey during the 2018-2019 academic year. The convenience sampling method was used to decide on the study group. The convenience sampling method aims to save money, time, and effort by allowing the researcher to get an easily accessible sample (Büyüköztürk et al., 2014). In both classes, the students were

asked about their technological devices. The class, with a greater number of students having technological devices, would be the experimental group. Table 1 demonstrates the distribution of the students in the study by the experimental group, control group, and gender.

Table 1. Demographic characteristics of the participants in the sample

	Gender		
Group	Female	Male	Total
Experimental	7	9	16
Control	9	7	16
Total	16	16	32

Data Collection

This study taught the Ethics and Security subject of the fifth-grade ITS course with flipped learning and gamification methods. The ethics and security success test was used in the study to find the change in students' success. The researchers developed the ethics and security success test, and a validity and reliability analysis was performed. The ethics and security success test was used as a pre-test before the instruction and as a post-test afterwards for both the experimental and control groups. The Ethics and Security subject outcomes were analyzed before designing the success test, and a question pool of 46 questions was prepared. An expert opinion form was designed for the questions in the question pool. The expert opinion form was sent for expert opinion to the faculty members from the department of Computer Education and Instructional Technology [CEIT], the ITS teachers who had completed their master's degree in the department of CEIT, and the ITS teachers who taught the Ethics and Security subject.

After consulting with nine experts, it was decided that 42 questions would remain in the test (Alpar, 2016). With the remaining 42 questions, a draft test form was designed. The draft test was given to 235 students in two different secondary schools in a city located in western Turkey. The data from the draft test form was coded with the statistical analysis software. The double point-serial correlation was used to decide which question should be discarded from the test because the test's items scored as 1 and 0 (Alpar, 2016). The analysis was made also by using the item-total correlations, upper 27% of total test score distribution and lower 27% of total test score distribution comparison, Guttman split-half coefficient and Kuder Richardson 20 [KR-20] test. The items that needed to be discarded from the test and the items that needed to be included in the test were decided. The item-total correlation coefficients were found between .368 and .618; upper 27% of total test score distribution and lower 27% of total test score distribution comparison were statistically meaningful ($p<.05$); the KR-20 value was statistically meaningful was found as .888 and Guttman split-half coefficient was calculated as .829. Following all the analyses, it was agreed to keep 25 items in the test in the final version of the ethics and security success test. The items' difficulty values of these 25 items were between .51 and .86. The highest score on the test was 25, and the lowest score was zero.

A semi-structured interview form was prepared to figure out the students' opinions in the experimental group. Semi-structured interviews start with asking questions that had already been prepared, but they provide flexibility to the researcher with the changeable or updatable questions and help to gain in-depth information on the subject being researched (Yıldırım & Şimşek, 2013). The literature (Alsancak Sırakaya, 2017; Güç, 2017; Yavuz, 2016; Özer et al., 2018; Yapıcı & Karakoyun, 2017) was reviewed to prepare the semi-structured interview questions based on similar questions in the studies examined. The interview form was sent to two faculty members from the department of CEIT to get an expert opinion. The semi-structured interview form was made ready for implementation based on the experts' suggestions. Before the interviews, the students were told that the answers they gave to the questions would not affect their success in the course and it was important to express their positive or negative thoughts.

Analysis of Data, Validity and Reliability

The statistical analysis software was used to code the quantitative data collected from the ethics and security success test. The success test was used to measure the students' total scores in the experimental and control groups before and after instruction. It was tested whether the scores had a normal distribution or not before deciding whether parametric or nonparametric tests would be used in the data analysis. The Shapiro-Wilk test was used to determine the normality of the data. The sample size is less than 50, the Shapiro-Wilk test is used (Alpar, 2016). Table 2 presents the result of Shapiro-Wilk's normality test.

Table 2. The result of Shapiro-Wilk's normality test

	Group	Statistics	df	p
Pre-test	Experimental	.903	16	.091
	Control	.948	16	.457
Post-test	Experimental	.941	16	.357
	Control	.912	16	.127

When looking at Table 2, the p values for the scores are greater than .05. According to Alpar (2016), when the Shapiro-Wilk's test produced p values greater than .05, it indicates that the data are normally distributed. As a result, the scores demonstrated a normal distribution. Since the data had a normal distribution, two-way analysis of variance [ANOVA] for mixed measures, one of the parametric tests, was used to decide whether there was a statistically significant difference between the experimental and control groups' scores (Alpar, 2016; Büyüköztürk, 2020; Salkind, 2019/2011; Seçer, 2017). To decide the reliability of the data, KR-20 values were calculated. Table 3 shows the coefficients.

Table 3. KR-20 values calculated for the scores

Group	Pre-test	Post-test
Experimental	.784	.900
Control	.809	.808

When looking at Table 3, the reliability coefficients are high. According to Büyüköztürk et al. (2014), values of 0.70 and above are sufficient for the reliability of the data. As a result, the data collected in the study can be reliable.

The data got from semi-structured interviews was scripted. The scripted data were shown to the participants randomly selected and their accuracy was confirmed to ensure the validity of the data. The content analysis was conducted to analyze the data. The content analysis is defined as coding and summarizing research data systematically based on the concepts that emerge after conceptualization and determination of the categories accordingly (Büyüköztürk et al., 2014; Yıldırım & Şimşek, 2013). The students' answers to the questions were used as quotations. The second researcher coded the data from eight randomly selected students for reliability, and the agreement ratio between the coders was examined. The formula the Reliability=(number of categories with agreement)/(total number of categories with and without agreement) was used to calculate the agreement ratio between coders (Miles & Huberman, 1994). The agreement ratio between coders was calculated as Reliability=162/201=.81. According to Miles and Huberman (1994), the agreement ratio between the two coders is greater than .70, indicating the reliability between the coders. As a result, the data analysis made by the first researcher can be reliable. The data from eight randomly selected students were re-coded by the first researcher one month after the first coding, and the reliability was calculated using the same formula as 196/201=.98. This ratio, which means internal consistency, should be around .90, according to Miles and Huberman (1994).

Flipped learning and gamification activities in the study

Videos were prepared for the flipped learning method applied in the experimental group. For this, all the outcomes and subject contents of the Ethics and Security subject were examined by using the ITS course Curriculum (fifth and sixth Grades) (Milli Eğitim Bakanlığı [Ministry of National Education] [MEB], 2018) as a guide. The flipped learning videos were created using the PowToon platform and free objects. The videos were assessed in terms of whether the content was appropriate for the subject, whether the visualizations were appropriate for the subject, the duration of the content's visibility in the video, the appropriateness of the sound effects added to the videos, the transitions of the video content, and the suitability of the object's entry and exit timescale. They were presented to two experts from the department of CEIT, and their feedback was taken into consideration. The videos were rearranged according to the experts' suggestions. Videos on "ethical values", "Internet and ICT usage rules", "What we should do on the Internet", "digital citizenship", "nine elements of digital citizenship", "e-government", "copyright and what a digital citizen should do", "strong passwords", and "cybercrimes" were produced. All videos were made publicly available on YouTube. The students in the experimental group were given the video links through the Education Information Network [EBA] platform that an online learning management system used in Turkey by K12 students and teachers. The videos were uploaded to students' mobile devices that did not have access to the Internet, and all students could access them. The gamification activities were prepared according to the activities of the student's textbook by using Kahoot and LearningApps application. "Matching", "true-false", "puzzle" and "memory game" were forms of gamification activities. The students were asked to form two-person groups when taking part in the gamification activities. Those who were successful in the gamification

activities received badges that had been previously planned. The photos of the students in the group that received the most badges at the end of the gamification activities were posted on the classroom bulletin board.

Results

The students' total scores were calculated from the ethics and security success test, which was applied to the experimental and control groups before and after the Ethics and Security subject was taught. Table 4 shows the descriptive statistics of the test scores.

Table 4. The descriptive statistics of the ethics and security success test scores

	Pre-test			Post-test		
Group	N	$\overline{X}$	SD	N	$\overline{X}$	SD
Experimental	16	11.63	4.992	16	15.75	6.547
Control	16	14.44	5.033	16	15.25	4.879

Note. $\overline{X}$: mean; SD: standard deviation

When the descriptive statistics of the test scores in Table 4 are examined, the experimental group's mean score on the test increased from 11.63 to 15.75, while the control group's mean score increased from 14.44 to 15.25. The significance of the increases observed in the experimental and control groups' scores was assessed using a two-way ANOVA for mixed measures, one of the parametric tests. The assumptions related to ANOVA were not met because Mauchly's test of sphericity statistics was not significant ($p<.05$), so it was used Huyn-Feldt correction (Field, 2016), Table 5 presents the results of the test.

Table 5. The results of two-way ANOVA for mixed measures

Source	Sum of Squares	df	Mean Square	F	p	η^2
Between-Subjects	1574.985	31				
Group (experimental/control)	21.391	1	21.391	.413	.525	.014
Error	1553.594	30	51.786			
Within-Subjects	341.501	32				
Measure (pre-/post-test)	97.516	1	97.516	14.620	.001	.328
Group*Measure	**43.891**	**1**	**43.891**	**6.581**	**.016**	**.180**
Error	200.094	30	6.670			
Total	1915.576	63				

Table 5 demonstrates that there is no significant difference between the experimental and control groups' mean scores [$F(1,31)=.413$, $p>.05$, $\eta^2=.014$], but there is a significant difference between the pre- and post-test mean scores [$F(1,32)=14.620$, $p<.05$, $\eta^2=.328$]. According to the Group*Measure test, the mean scores demonstrate a significant difference [$F(1,30)=6.581$, $p<.05$, $\eta^2=.180$]. These findings were interpreted as the experimental group, taught with flipped learning and gamification methods, was more successful than the control group (Figure 2).

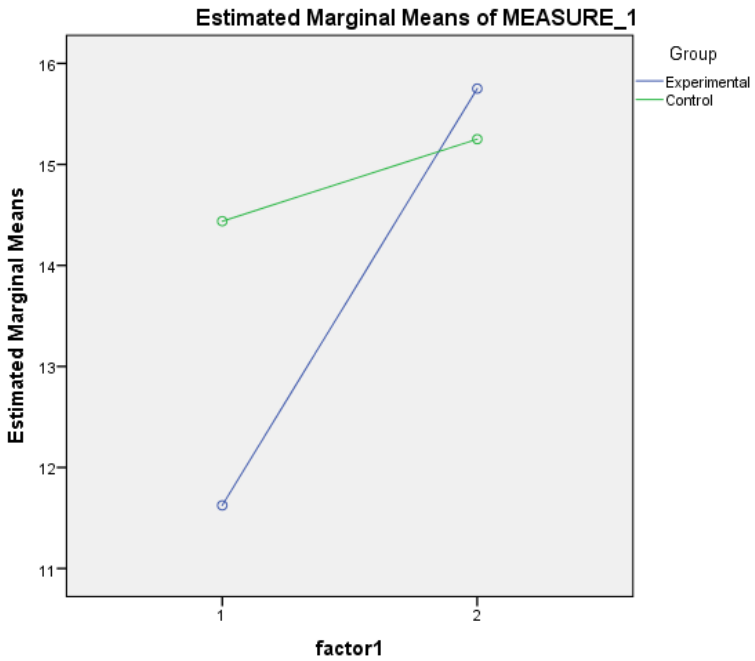


Figure 2. Estimated marginal means of measure for ANOVA

It was also done a two-way ANCOVA for mixed measures using pre-test scores as covariance. The assumptions related to ANCOVA were not met because Mauchly's test of sphericity statistics was not significant ($p<.05$), so it was used Huyn-Feldt correction (Field, 2016), Table 6 presents the results of the test.

Table 6. The results of two-way ANCOVA for mixed measures

Source	Sum of Squares	df	Mean Square	F	p	η^2
Between-Subjects	1587,370	31				
Pre-test	1357.427	1	1357.427	200.673	.051	.125
Group (experimental/control)	**33.776**	**1**	**33.776**	**4.993**	**.033**	**.147**
Error	196.167	29	6.764			
Within-Subjects	261.997	32				
Measure (pre-/post-test)	28.127	1	28.127	4.158	.051	.125
Pre-test*Measure	3.927	1	3.927	0.581	.452	.020
Group*Measure	**33.776**	**1**	**33.776**	**4.993**	**.033**	**.147**
Error	196.167	29	6.764			
Total	1849,367	63				

Table 6 demonstrates that there is a significant difference between the experimental and control groups' mean scores when the pre-test scores were used as covariance [$F(1,29)=4.993$, $p<.05$, $\eta^2=.147$]. According to the Group*Measure test, the mean scores show a significant difference [$F(1,29)=4.993$, $p<.05$, $\eta^2=.147$]. These findings were interpreted as the experimental group was more successful than the control group when the pre-test scores were used as covariance (Figure 3).

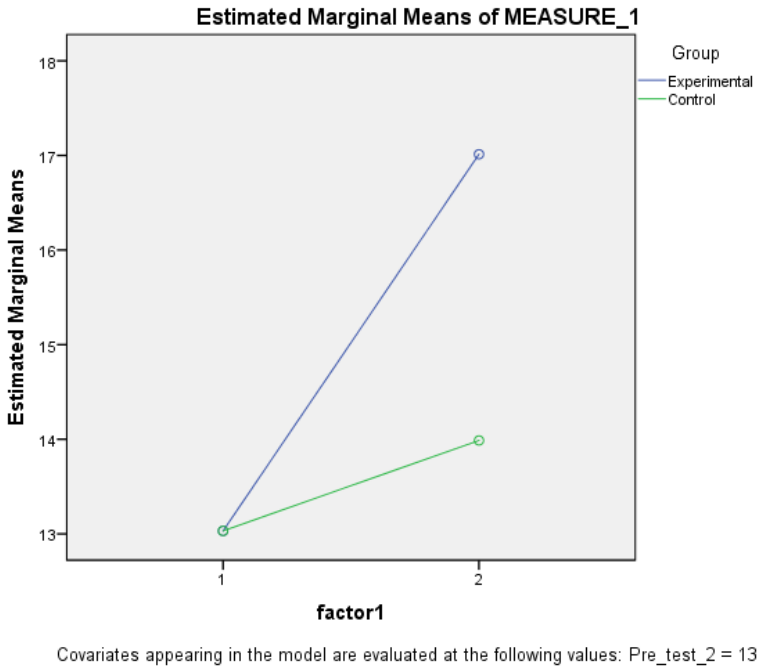


Figure 3. Estimated marginal means of measure for ANCOVA

Semi-structured interviews with students in the experimental group were conducted to learn about students' opinions. The students were asked six questions and related sub-questions during the interviews. The categories and sub-categories from the interviews and the frequencies of the responses are given in Table 7.

Table 7. The categories and sub-categories obtained from the analysis of the interviews

Themes	**Categories**	**Sub-categories**	**Frequencies**
Performing activities similar to flipped learning and gamification activities in other courses	Yes	-	0
	No		16
Thought about flipped learning and gamification activities	Flipped learning	Has a positive aspect	15
		Has a positive aspect	1
		Has a negative aspect	2
		Has no negative aspect	14
		Enjoyable	15
		Not enjoyable	1
	Gamification	Has a positive aspect	15
		Has a positive aspect	1
		Has a negative aspect	6
		Has a negative aspect	10
		Enjoyable	15
		Not enjoyable	1
Thought about the instructiveness of flipped learning and gamification activities	Flipped learning	Instructive	15
		Not instructive	1
	Gamification	Instructive	16
		Not instructive	0
Difficulties or problems in the flipped learning and gamification activities	Flipped learning	Has a difficulty or problem	0
		Has no difficulty or problem	16
	Gamification	Has a difficulty or problem	6
		Has no difficulty or problem	10
Thought about flipped learning and gamification activities in other courses	Flipped learning	Should be used	12
		Should not be used	4
	Gamification	Should be used	14
		Should not be used	2

The first question in the interview was “did you perform activities similar to the flipped learning and gamification activities we implemented in your other courses? If that is the situation, then how?” All the students answered “*no*” stating that they did not perform similar to the flipped learning or gamification activities in any course.

The students were asked “What do you think about using flipped learning activities in your course?” as a second question. 15 students gave the answers coded as “positive” and one student coded as “negative”. “*It allows us to learn everything*” (Student 1), “*we can watch easily at home and take notes*” (Student 5), and “*it was fun to watch videos*” (Student 16) were examples of positive answers. “*It’s not fun to learn at home*” said the student, who answered negatively (Student 4). “What are the aspects of flipped learning method that you think is positive and negative?” was asked regarding the second question. "*I learned what I do not know through the videos*" (Student 1), "*to watch the videos again*" (Student 2), "*I learned things I did not know*" (Student 8), "*I learned the subject with the videos at home. I concentrated in class while playing games*" (Student 9), and "*I saw the words we did not know in the videos*" (Student 13) were among the responses of 15 students whose responses were coded as "has a positive aspect". One student’s answer was coded as “has no positive aspect”. Two students’ answers were coded as “has a negative aspect” and their explanations was “*we should do lessons in the classroom*” (Student 4), and “*I think the videos should be watched in the classroom*” (Student 16). 14 students’ answers to the question were coded as “has no negative aspect”. The final question asked concerning the second question was “do you think learning with the flipped learning activities are enjoyable or not?” 15 students’ answers to this question were coded as “enjoyable” and, one student’s answer “not enjoyable”. “*Videos are like funny cartoons*” (Student 1), “*very amusing*” (Student 5), “*videos are incredibly fun*” (Student 9), and “*I think it is fun*” (Student 14) were among the 15 students’ answers.

As the third question, the students were asked the following question: “What do you think about the use of gamification activities in your course?” 15 students gave the answers coded as “positive” and one student gave the answer coded as “negative”. Examples of positive answers were “*badges are interesting, I loved playing games*” (Student 9), “*games contributed to my learning*” (Student 13), “*it’s good to play*” (Student 4). The negative answer is “*it is better to listen to the lesson in the classroom*” (Student 3). Regarding the third question, the question “what are the aspects of gamification activities that you think are positive and negative?” was asked. “*It enables us to learn*” (Student 1), “*learning with the computer is fun and instructive*” (Student 2), “*it is better to teach religion at home. Gamification activities are fun, but should be in religion course* “ (Student 4), “*we are competing and winners are getting badges, they become the star of the week*” (Student 5), “*I played a game to earn a badge*” (Student 8), “*I got a badge in class*” (Student 6), “*the positive aspect is that it was good that the teacher made a video instead of explaining it*” (Student 12), “*it is fun, we gain knowledge. We learn things we do not know*” (Student 15) were among the answers from 15 students whose answers were coded as “has a positive aspect”. The explanation “*I do not like to play games*” (Student 3) was coded as “has no positive aspect”. Six students’ answers were coded as “has a negative aspect” and the examples of the student answers were “*boring*” (Student 3), “*not getting a badge*” (Student 6), “*not being able to look at what the teacher showed*” (Student 7), “*if we have not learned something, we can’t do it. Some games were hard to play due to lack of knowledge*” (Student 10). 10 students’ answers were coded as “has no negative aspect”. Finally, regarding the third question, the question “do you think learning with the gamification activities are enjoyable or not?” was asked to the students. 15 students’ answers were coded as “enjoyable”, one student answer was coded as “not enjoyable”.

Students were asked the following question in the fourth question: "What do you think about the instructiveness of flipped learning and gamification activities?" About the flipped learning activities, 15 students gave the answers coded as "instructive" and one student as "not instructive". The answer of the student, whose answer was coded as "not instructive", was "*the lesson at home is not instructive*" (Student 4). Examples of comments coded as "instructive" were "*I think it is good*" (Student 1), "*beautiful*" (Student 2), "*instructive*" (Student 3, 6, 11, 12, 14, 16), "*enabling us to learn*" (Student 10), "*I think it has a good effect*" (Student 13). Regarding the gamification activities, comments were received from all the students (16 students) that they were instructive. Answer examples were "*instructive*" (Student 1), "*very entertaining and teaching*" (Student 5), "*we learn well*" (Student 7), "*I think well*" (Student 10), "*I learned*" (Student 14).

The students were asked the following question as the fifth question: “Did you have any difficulties or problems in the flipped learning and gamification activities? If yes, please explain.” Regarding flipped learning method, all the students (16) answered "no", stating that they did not have any difficulties or problems. Regarding the gamification activities, six students answered "yes". The responses of these students were "*Once my group friend accidentally left the game*" (Student 1), "I do not like to play games so I got bored" (Student 3), "The time of the games is short" (Student 6), "*I had difficulty answering the questions*" (Student 9), "*I did it wrong sometimes*" (Student 10), "*Doing it wrong or not being able to mark in the Kahoot application, lack of time*" (Student 15). 10 students answered "no" and indicated that they had no difficulties or problems.

In the sixth question, students were asked the following question: "What do you think about the use of flipped learning and gamification activities in other courses?" Regarding the flipped learning method, 12 students’ answers were coded as "should be used" and four were coded as "should not be used". Examples of responses

coded as "should be used" were "*it should be used in religion class*" (Student 4), "*would be very good. I liked the videos*" (Student 5), "*I think it's good*" (Student 10), "*It would be good*" (Student 11), "*It would be good if it was used in religion class*" (Student 16), examples of responses coded as "should not be used" were "*Watching videos is boring*" (Student 9), "*We should not watch videos, we should do a lesson*" (Student 12). When asked why students wanted to use these methods in religion class, they indicated that they wanted to use them to be used because they did not like the religion course. Regarding gamification activities, 14 students' answers were coded as "should be used" and two students' answers were coded as "should not be used". One answer coded as "should not be used" was "*games are not played in every course, I cannot learn*" (Student 12).

Discussion, Conclusion and Suggestions

The Ethics and Security subject of the fifth-grade ITS course was taught with flipped learning and gamification methods. Flipped learning is defined as performing the classroom activities at home and applying the activities given as homework in the classroom (Bergmann & Sams, 2012). The students could access videos online were prepared and shared with them for the flipped learning method. When the students who had learned at home with the videos came to the classroom, they made their learning permanent with gamification activities guided by the teacher (Demiralay & Karataş, 2014). Gamification activities were not games, although they came from a game concept. Game elements (badge, progress chart, winner's bulletin board, ambition to win, entertainment, motivation) were used in the gamification activities. The goal was for the students to learn while having fun and for all of them to be active. Online applications were used in some of the gamification activities, such as Kahoot and LearningApps.

It was revealed in the study that the students in the experimental group, who were taught with flipped learning and gamification methods, were more successful and had positive opinions about the methods. The content of the Ethics and Security subject, which includes abstract topics, was visualized and concretized with the videos used for the flipped learning activities. The students' success also was increased with the gamification activities. As a result, the students better learned the Ethics and Security subject, which was taught with flipped learning and gamification activities. It can be concluded that flipped learning and gamification methods may have facilitated students' learning. The flipped learning method allowed the students to learn at their own pace using virtual platforms at home. Students' learning was reinforced with the gamification activities in the classroom. Similarly, there were studies in the literature that used flipped learning and gamification methods together in the teaching (Alsancak Sırakaya, 2017; Gómez-Carrasco et al., 2020; Gündüz & Akkoyunlu, 2020; Huang et al., 2018; Huang & Hew, 2018; Hung, 2018; Lai & Foon, 2019; Lo & Hew, 2020; Matsumoto, 2016; Özer et al., 2018; Parra-González et al., 2021; Pozo Sánchez et al., 2020; Sailer & Sailer, 2021; Segura-Robles et al., 2020; Thongmak, 2019; Zainuddin et al., 2019; Zou, 2020). Matsumoto (2016) found that the flipped learning and gamification activities were to be successful in improving students' understanding and motivation. Huang et al. (2018) concluded that the gamified flipped learning group's post-test scores were higher than those of the non-gamified flipped learning group. Gündüz and Akkoyunlu, (2020) found that the experimental group taught with the online flipped learning and gamification activities had higher scores than the control group. In their studies, Huang and Hew (2018), Hung (2018), Lai and Foon (2019), Thongmak (2019), Zainuddin et al. (2019), Gómez-Carrasco et al. (2020), Lo and Hew (2020), Pozo Sánchez et al. (2020), Segura-Robles et al. (2020), Parra-González et al. (2021), Sailer and Sailer (2021), found that flipped learning and gamification methods were beneficial. The results matched the results of the studies in the literature. Using flipped learning and gamification methods to teach the Ethics and Security subject of the fifth-grade ITS course is recommended because the Ethics and Security subject is abstract.

It was determined how the experimental group's opinions about teaching in this study. The students expressed positive opinions about the methods in the semi-structured interviews. The students stated they learned the subjects from the flipped learning videos and that they found the flipped learning and gamification activities to be interesting, instructive, and enjoyable. As a result, it can be concluded that students can take on their own learning responsibilities and desire to engage in various activities during lessons. Besides studies in the literature reporting students' positive opinions about flipped learning method (Güç, 2017; Yavuz, 2016) and gamification methods (Yapıcı & Karakoyun, 2017), there were studies in the literature reporting students' positive opinions about use of these two methods together: Alsancak Sırakaya (2017), Huang and Hew (2018), Özer et al. (2018), Lai and Foon (2019), Thongmak (2019), Gómez-Carrasco et al. (2020), Lo and Hew (2020) and Zou (2020) concluded that participants in their studies had positive opinions about flipped learning and gamification methods. The students' opinions about the course used the flipped learning and gamification methods in this study were like those of the studies in the reviewed literature. Considering the students' success in the ethics and security success test, it can be concluded that the students' opinions revealed in the interviews support this finding. As a result, it

can be stated that teaching with flipped learning and gamification methods has a positive effect on students' success and opinions.

The effect of the flipped learning and gamification activities on learning the Ethics and Security subject was examined in this study. The effect of flipped learning and gamification activities on learning different subjects can be examined in different studies. The effect of the flipped learning and gamification activities on the students' success in the Ethics and Security subject was investigated in this study. The study has the limitations of 32 fifth-grade students and the measurement tool used in the study. Different measurement tools, such as scales like attitude scale, self-efficacy scale, can be used for the effect of flipped learning and gamification activities in another study. The nonequivalent group pretest-posttest design was used to collect the quantitative data. A true experimental study can be performed by randomly assigning participants to the experimental and control groups in another study. It can be studied with a sample that includes more participants in another study. The flipped learning videos were produced using PowToon, and the gamification activities were produced using Kahoot and LearningApps. Different applications can be used in different studies. The online platform EBA was used for the videos in the study. Other platforms can also be used in another study.

Acknowledgements or Notes

This study is part of the master's thesis named “Teaching of Ethics and Security Unit with the Approach of Flipped Learning and Gamification in the Fifth Grade Information Technologies and Software Course” prepared by the first author under the supervision of the second author.

Author(s) Contribution Rate

Gülseren Tarhan: Conceptualization, Validation, Investigation, Resources, Data Curation, Writing - Original Draft, Visualization
Gülcan Öztürk: Conceptualization, Methodology, Validation, Formal analysis, Writing - Review & Editing, Supervision

Conflicts of Interest

The authors declare that they have no conflict of interest.

Ethical Approval (only for necessary papers)

Since the study was produced from a master's thesis completed before 2020, ethical approval was not obtained. But legal permission was obtained from the Ministry of National Education in Turkey to conduct the study and anonymity of the participants was provided in the reporting. In the study, no images were used by revealing the identity of the participants.

References

Alpar, R. (2016). *Spor, sağlık ve eğitim bilimlerinden örneklerle uygulamalı istatistik ve geçerlik-güvenirlik [Applied statistics and validity-reliability with examples from sports, health and educational sciences]* (4th ed.). Ankara: Detay Yayıncılık.

Alsancak Sırakaya, D. (2017). Student views on gamified flipped classroom model. *Ondokuz Mayis University Journal of Faculty of Education, 36*(1), 114-132. doi: 10.7822/omuefd.327393

Ar, N. A. (2016). *Oyunlaştırmayla öğrenmenin meslek lisesi öğrencilerinin akademik başarı ve öğrenme stratejileri kullanımı üzerine etkisi [The effects of gamification on academic achievement and learning strategies usage of vocational high school students]* [Unpublished master’s thesis]. Sakarya University, Institute of Education Sciences, Sakarya.

Aral, N., Gürsoy, F., & Köksal, A. (2001). *Oyun [Game]*. Ankara: Ya-Pa Yayınları.

Aydın, B. (2016). *Ters yüz sınıf modelinin akademik başarı, ödev/görev stres düzeyi ve öğrenme transferi üzerindeki etkisi [The effects of flipped classroom model on academic achievement, homework/task stress level and transfer of learning]* [Unpublished master’s thesis]. Süleyman Demirel University, Institute of Education Sciences, Isparta.

Bergmann, J., & Sams, A. (2012). *How the flipped classroom is radically transforming learning*. Retrieved from http://www.thedailyriff.com/articles/how-the-flipped-classroom-is-radically-transforming-learning-536.php

Boyraz, S. (2014). *İngilizce öğretiminde tersine eğitim uygulamasının değerlendirilmesi [Evaluating flipped classroom/education method in English teaching]* [Unpublished master's thesis]. Afyon Kocatepe University, Institute of Social Sciences, Afyonkarahisar.

Büyüköztürk, Ş. (2020). *Sosyal bilimler için veri analizi el kitabı: İstatistik, araştırma deseni SPSS uygulamaları ve yorum [Data analysis handbook for social sciences: Statistics, research design SPSS applications and interpretation]* (28th ed.). Ankara: Pegem Akademi.

Büyüköztürk, Ş., Çakmak, E. K., Akgün, Ö. E., Karadeniz, Ş., & Demirel, F. (2014). *Bilimsel araştırma yöntemleri [Scientific research methods]* (17th ed.). Ankara: Pegem Akademi.

Chen, Y., Wang, Y., Kinshuk, & Chen, N. S. (2014). Is FLIP enough? Or should we use the FLIPPED model instead? *Computers and Education,* 79, 16-27. doi: 10.1016/j.compedu.2014.07.004

Creswell, J., & Plano Clark, V. (2018). *Designing and conducting mixed methods research*. Los Angeles: SAGE.

Çakır, E., & Yaman, S. (2018). The effect of flipped classroom model on students' science success and computational thinking skills. *Gazi University Journal of Gazi Educational Faculty (GUJGEF), 38*(1), 75-99. Retrieved from http://www.gefad.gazi.edu.tr/en/download/article-file/462732

De-Marcos, L., Dominguez, A., Saenz-de-Navarrete, J., & Pages, C. (2014). An empirical study comparing gamification and social networking on e-learning. *Computers & Education, 75*(6), 82-91. doi: 10.1016/j.compedu.2014.01.012

Demiralay, R. (2014). *Evde ders okulda ödev modelinin benimsenmesi sürecinin yeniliğin yayılımı kuramı çerçevesinde incelenmesi [Examining the process of flipped classroom model acceptance in the context of diffusion of innovations theory]* [Unpublished doctoral dissertation]. Gazi University, Institute of Education Sciences, Ankara.

Demiralay, R., & Karataş, S. (2014). Flipped classroom model. *Journal of Research in Education and Teaching, 3*(3), 333-340. Retrieved from http://jret.org/FileUpload/ks281142/File/31.demiralay.pdf

Deterding, S., Dixon, D., Khaled, R., & Nacke, L. (2011). From game design elements to gamefulness: Defining "gamification". *In Proceedings of the 15th International Academic MindTrek Conference: Envisioning future media environments* (pp. 9-15). Tampere, Finland: ACM. doi: 10.1145/2181037.2181040

Dominguez, A., Saenz-de-Navarrete, J., De-Marcos, L., Fernandez-Sanz, L., Pages, C., & Martinez-Herraiz, J. J. (2013). Gamifying learning experiences: Practical implications and outcomes. *Computers & Education, 63*, 380-392. doi: 10.1016/j.compedu.2012.12.020

Field, A. (2016). *Discovering statistics. Repeated measures ANOVA.* Retrieved from https://www.discoveringstatistics.com/docs/repeatedmeasures.pdf

Filiz, O., & Kurt, A. A. (2015). Flipped learning: Misunderstandings and the truth. *Journal of Educational Sciences Research, 5*(1), 215-229. doi: 10.12973/jesr.2015.51.13

Fisher, R. L., LaFerriere, R., & Rixon, A. (2020). Flipped learning: An effective pedagogy with an Achilles' heel. *Innovations in Education and Teaching International, 57*(5), 543-554. doi: 10.1080/14703297.2019.1635904

Fraenkel, J. R., & Wallen, N. E. (2012). *How to design and evaluate research in education* (8th ed.). McGraw-Hill.

Gençer, B. G. (2015). *Okullarda ters-yüz sınıf modelinin uygulanmasına yönelik bir vaka çalışması [A case study towards the implementation of the flipped classroom model in the schools]* [Unpublished master's thesis]. Bahçeşehir University, Institute of Education Sciences, İstanbul.

Gómez-Carrasco, C. J., Monteagudo-Fernández, J., Moreno-Vera, J.R., & Sainz-Gómez, M. (2020). Evaluation of a gamification and flipped-classroom program used in teacher training: Perception of learning and outcome. *PLOS ONE, 15*(7), e0236083. doi: 10.1371/journal.pone.0236083

Güç, F. (2017). *Rasyonel sayılar ve rasyonel sayılarda işlemler konusunda ters-yüz sınıf uygulamasının etkileri [The effect of the flipped classroom practice on the rational numbers and operations with rational numbers]* [Unpublished master's thesis]. Amasya University, Institute of Science, Amasya.

Gündüz, A. Y., & Akkoyunlu, B. (2020). Effectiveness of gamification in flipped learning. *SAGE Open, October-December 2020*, 1-16. doi: 10.1177/2158244020979837

Hanus, M. D., & Fox, J. (2018). Corrigendum to assessing the effects of gamification in the classroom: A longitudinal study on intrinsic motivation, social comparison, satisfaction, effort, and academic performance. *Computers & Education, 80*(2015), 152-161. doi: 10.1016/j.compedu.2014.08.019

Hayırsever, F., & Orhan, A. (2018). A theoretical analysis of flipped learning. *Mersin University Journal of the Faculty of Education, 14*(2), 572-596. doi: 10.17860/mersinefd.431745

Huang, B., & Hew, K. F. (2018). Implementing a theory-driven gamification model in higher education flipped courses: Effects on out-of-class activity completion and quality of artifacts. *Computers & Education, 125*(2018) 254-272. doi: 10.1016/j.compedu.2018.06.018

Huang, B., Hew, K. F., & Lo, C. K. (2018). Investigating the effects of gamification-enhanced flipped learning on undergraduate students' behavioral and cognitive engagement. *Interactive Learning Environments, 27*(8), 1106-1126. doi: 10.1080/10494820.2018.1495653

Hung, H. T. (2018). Gamifying the flipped classroom using game-based learning materials. *ELT Journal*, 72(3), 296-308. doi: 10.1093/elt/ccx055

Kara, C. O. (2016). Flipped Classroom. *Tıp Eğitimi Dünyası, 45*, 225-228. Retrieved from https://dergipark.org.tr/tr/download/article-file/222436

Karadeniz, A. (2015). Flipped classrooms. *Journal of Research in Education and Teaching, 4*(3), 322-326. Retrieved from http://www.jret.org/FileUpload/ks281142/File/35._abdulkadir_karadeniz.pdf

Karataş, E. (2014). Gamification in education: Research trends. *Ahi Evran University Journal of Kırşehir Education Faculty (KEFAD/JKEF), 15*(2), 315-333. Retrieved from https://dergipark.org.tr/en/download/article-file/1490007

Kim, J. T., & Lee, W. H. (2015). Dynamical model for gamification of learning (DMGL). *Multimedia Tools and Applications*, *74*(19), 8483-8493. doi: 10.1007/s11042-013-1612-8

Kong, S. Y., Mohd Yaacob, N., & Mohd Ariffin, A. R. (2018). Constructing a mixed methods research design: Exploration of an architectural intervention. *Journal of Mixed Methods Research*, *12*(2), 148–165. doi: 10.1177/1558689816651807

Kotluk, N., & Kocakaya, S. (2015). Digital storytelling for developing 21st century skills: From high school students' point of view. *Journal of Research in Education and Teaching, 4*(2), 354-363. Retrieved from http://www.jret.org/FileUpload/ks281142/File/36.nihat_kotluk..pdf

Lage, M. J., Platt, G. J., & Treglia, M. (2000). Inverting the classroom: A gateway to creating an inclusive learning environment. *Journal of Economic Education, 31*(1), 30-43. doi: 10.2307/1183338

Lai, K. H., & Foon, H. K. (2019). To assess a gamified 5E flipped learning platform's effectiveness in promoting student learning and achievement in physics: A design-based research. In W. W. K. Ma, W. W. L. Chan & C. M. Cheng (eds), *Shaping the future of education, communication and technology. Educational communications and technology yearbook.* Singapore: Springer. doi: 10.1007/978-981-13-6681-9_7

Lee, J. J., & Hammer, J. (2011). Gamification in education: What, how, why bother? *Academic Exchange Quarterly, 15*(2), 146. Retrieved from https://www.researchgate.net/publication/258697764_Gamification_in_Education_What_How_Why_Bother

Li, C., Dong, Z., Untch, R. H., & Chasteen, M. (2013). Engaging computer science students through gamification in an online social network based collaborative learning environment. *International Journal of Information and Education Technology*, *3*(1), 72-77. doi: 10.7763/IJIET.2013.V3.237

Lister, M. (2015). Gamification: The effect on student motivation and performance at the post-secondary level. *Issues and Trends in Educational Technology*, *3*(2). doi: 10.2458/azu_itet_v3i2_Lister

Lo, C. K., & Hew, K. F. (2020). A comparison of flipped learning with gamification, traditional learning, and online independent study: The effects on students' mathematics achievement and cognitive engagement. *Interactive Learning Environments, 28*(4), 464-481. doi: 10.1080/10494820.2018.1541910

Matsumoto, T. (2016). Motivation strategy using gamification. *Creative Education, 7*, 1480-1485. doi: 10.4236/ce.2016.710153

Mert, Y., & Samur, Y. (2018). Students' opinions toward game elements used in gamification application. *Turkish Online Journal of Qualitative Inquiry (TOJQI), 9*(2), 70-101. doi: 10.17569/tojqi.364130

Meşe, C. (2016). *Harmanlanmış öğrenme ortamlarında oyunlaştırma bileşenlerinin etkililiği [Effectiveness of gamification elements in blended learning environments]* [Unpublished doctoral dissertation]. Anadolu University, Institute of Education Sciences, Eskişehir.

Miles, M. B., & Huberman, A. M. (1994). *Qualitative Data Analysis*. London: Sage Publications.

Milli Eğitim Bakanlığı [Ministry of National Education] [MEB] (2018). *Bilişim teknolojileri ve yazılım dersi öğretim programı (ortaokul 5 ve 6. sınıflar) [Information technologies and software [ITS] course curriculum (secondary school fifth and sixth grade)]*. Ankara: MEB Yayınları.

Mohammed, D. A. (2018). *Gamification in e-learning: The effect on student performance and perception at an Iraqi university* [Unpublished master's thesis]. Çankaya University, Institute of Science, Ankara.

Özer, H., Kanbul, S., & Ozdamli, F. (2018). Effects of the gamification supported flipped classroom model on the attitudes and opinions regarding game-coding education. *International Journal of Emerging Technologies in Learning (iJET), 13*(1), 109-123. doi: 10.3991/ijet.v13i01.7634

Öztürk, Ç., & Korkmaz, Ö. (2020). The effect of gamification activities on students' academic achievements in social studies course, attitudes towards the course and cooperative learning skills. *Participatory Educational Research, 7*(1), 1-15. doi: 10.17275/per.20.1.7.1

Öztürk, S., & Alper, A. (2019). The effect of flipped learning method on the students' academic achievement, computer attitudes and self-directed learning skills in programming language teaching. *Science, Education, Art and Technology Journal (SEAT Journal), 3*(1), 13-26. Retrieved from https://dergipark.org.tr/tr/download/article-file/576132

Parra-González, M. E., López-Belmonte, J., Segura-Robles, A., & Moreno-Guerrero, A. J. (2021). Gamification and flipped learning and their influence on aspects related to the teaching-learning process. *Heliyon, 7*(2), e06254. doi: 10.1016/j.heliyon.2021.e06254

Pierce, R., & Fox, J. (2012). Vodcasts and active-learning exercises in a "flipped classroom" model of a renal pharmacotherapy module. *American Journal of Pharmaceutical Education, 76*(10), 196. doi: 10.5688/ajpe7610196

Pozo Sánchez, S., López Belmonte, J., Fuentes Cabrera, A., & López Núñez, J. A. (2020). Gamification as a methodological complement to flipped learning-an incident factor in learning improvement. *Multimodal Technologies and Interaction, 4*(2), 12. doi: 10.3390/mti4020012

Sağlam, D. (2016). *Ters-yüz sınıf modelinin İngilizce dersinde öğrencilerin akademik başarılarına ve tutumlarına etkisi [The effect of flipped classroom model on the academic achievements and attitudes of students in English language teaching]* [Unpublished master's thesis]. Bülent Ecevit University, Institute of Social Sciences, Zonguldak.

Sailer, M., & Sailer, M. (2021), Gamification of in-class activities in flipped classroom lectures. *British Journal of Educational Technology, 52*(1), 75-90. doi: 10.1111/bjet.12948

Salkind, N. J. (2019). *İstatistikten nefret edenler için istatistik [Statistics for people who (think they) hate statistics]* (A. Çuhadaroğlu, Z. Ç. Özcan & Y. İmamaoğlu, Trans.). Ankara: Pegem Akademi (Original work published 2011).

Seçer, İ. (2017). *SPSS ve LISREL ile pratik veri analizi [Practical data analysis with SPSS and LISREL]* (3rd ed.). Ankara: Anı Yayıncılık.

Segura-Robles, A., Fuentes-Cabrera, A., Parra-González, M. E., & López-Belmonte, J. (2020). Effects on personal factors through flipped learning and gamification as combined methodologies in secondary education. *Frontiers in Psychology, 11*, 1103. doi: 10.3389/fpsyg.2020.01103

Serçemeli, M. (2016). A new approach proposal in accounting education: Flipped classroom. *The Journal of Accounting and Finance, 69*, 115-126. doi: 10.25095/mufad.396664

Sezgin, S., Bozkurt, A., Yılmaz, E. A., & Van der Linden, N. (2018). Gamification, education and theoretical approaches: Motivation, engagement and sustainability in learning processes. *Mehmet Akif Ersoy University Journal of Education Faculty, 45*, 169-189. doi: 10.21764/maeuefd.339909

Su, C. Y., & Chen, C. H. (2018). Investigating the effects of flipped learning, student question generation, and instant response technologies on students' learning motivation, attitudes, and engagement: A structural equation modeling. *EURASIA Journal of Mathematics, Science and Technology Education, 14*(6), 2453-2466. doi: 10.29333/ejmste/89938

Şenel, A., & Gençoğlu, S. (2003). Technology education in a globalizing world. *The Journal of the Industrial Arts Education Faculty of Gazi University, 11*(12), 45-65. Retrieved from https://dergipark.org.tr/tr/download/article-file/296526

Thongmak, M. (2019). The student experience of student-centered learning methods: Comparing gamification and flipped classroom. *Education for Information, 35*, 1-28. doi: 10.3233/EFI-180189.

Turan, Z. (2015). *Ters yüz sınıf yönteminin değerlendirilmesi ve akademik başarı, bilişsel yük ve motivasyona etkisinin incelenmesi [The evaluation of flipped classroom method and examination of its effects on academic achievement, cognitive load and motivation]* (Doctoral dissertation). Atatürk University, Institute of Education Sciences, Erzurum.

Türkmen, G. P. (2017). *Oyunlaştırma yöntemiyle öğrenmenin öğrencilerin matematik başarılarına ve derse yönelik tutumlarına etkisi [The effect of gamification methodology on students' achievements and attitudes towards mathematics]* [Unpublished master's thesis]. Erciyes University, Institute of Educational Sciences, Kayseri.

Werbach, K., & Hunter, D. (2012). *For the win: How game thinking can revolutionize your business*. Philadelphia: Wharton Digital Press.

Wu, W. V., Hsieh, J. S., & Yang, J. C. (2017). Creating an online learning community in a flipped classroom to enhance EFL learners' oral proficiency. *Educational Technology & Society, 20*(2), 142-157. Retrieved from http://www.jstor.org/stable/90002170

Yapıcı, Ü., & Karakoyun, F. (2017). Gamification in biology teaching: A sample of Kahoot application. *Turkish Online Journal of Qualitative Inquiry (TOJQI), 8*(4), 396-414. doi: 10.17569/tojqi.335956

Yavuz, M. (2016). *Ortaöğretim düzeyinde ters yüz sınıf uygulamalarının akademik başarı üzerine etkisi ve öğrenci deneyimlerinin incelenmesi [An investigation into the effects of flipped classroom applications on the academic success and experiences of the students at secondary school]* [Unpublished master's thesis]. Atatürk University, Institute of Educational Sciences, Erzurum.

Yıldırım, A., & Şimşek, H. (2013). *Sosyal Bilimlerde Nitel Araştırma Yöntemleri [Qualitative research methods in the social sciences]* (extended 9th ed.). Ankara: Seçkin Yayıncılık.

Yıldırım, D. (2018). *Oyunlaştırmanın 5. sınıf öğrencilerinin sosyal bilgiler dersi öğrenme başarıları üzerindeki etkisinin oyunlaştırılmış testlerle sınanması [Testing the effect of gamification on the success of year fifth*

grade students' social science course learning] [Unpublished master's thesis]. Bahçeşehir University, Institute of Education Sciences, İstanbul.

Yıldırım, İ. (2016). *Oyunlaştırma temelli "öğretim ilke ve yöntemleri" dersi öğretim programının geliştirilmesi, uygulanması ve değerlendirilmesi [Development, implementation and evaluation of a gamification based curriculum for the lesson of "teaching principles and methods"]* [Unpublished doctoral dissertation]. Gaziantep University, Institute of Education Sciences, Gaziantep.

Yıldırım, İ. (2017). The effects of gamification-based teaching practices on student achievement and students' attitudes toward lessons. *The Internet and Higher Education, 33*, 86-92. doi: 10.1016/j.iheduc.2017.02.002

Yıldırım, İ., & Demir, S. (2016). Students' views about gamification based curriculum for the lesson of "teaching principles and methods". *International Journal of Curriculum and Instructional Studies (IJOCIS), 6*(11). 86-100. Retrieved from http://www.ijocis.com/index.php/ijocis/article/view/170/134

Yin, R. (2003). *Case study research, design and methods* (3rd ed.). London: Sage Publications.

Zainuddin, Z., Shujahat, M., Chu, S. K. W., Haruna, H., & Farida, R. (2019). The effects of gamified flipped instruction on learner performance and need satisfaction: A study in a low-tech setting. *Information and Learning Sciences, 120*(11/12), 789-802. doi: 10.1108/ILS-07-2019-0067

Zichermann, G., & Cunningham, C. (2011). *Gamification by design: Implementing game mechanics in web and mobile apps* (1st ed.). Sebastopol, California: O'Reilly Media.

Zou, D. (2020). Gamified flipped EFL classroom for primary education: Student and teacher perceptions. *Journal of Computers in Education, 7*(2), 213-228. doi: 10.1007/s40692-020-00153-w

Article History
Received: 22.08.2021
Received in revised form: 24.11.2021
Accepted: 23.01.2022
Article Type: Research Article

International Journal of Contemporary Educational Research (IJCER)

www.ijcer.net

Detecting Possible Learning Losses due to COVID-19 Pandemic: An Application of Curriculum-Based Assessment

Turker Toker[1]
[1] Usak University, 0000-0002-3038-7096

To cite this article:

Toker, T. (2022). Detecting Possible Learning Losses due to COVID-19 Pandemic: An Application of Curriculum-Based Assessment. *International Journal of Contemporary Educational Research*, *9*(1), 78-86. https://doi.org/10.33200/ijcer.985992

International Journal of Contemporary Educational Research

Volume 9, Number 1, March 2022, Page 78-86 ISSN: 2148-3868

Detecting Possible Learning Losses due to COVID-19 Pandemic: An Application of Curriculum-Based Assessment

Turker Toker[1*]
[1] Usak University

Abstract

When the pandemic COVID -19 led to school closures, many of us had no idea that this disruption would last months and perhaps more than a year. Curriculum-based assessment (CBA) is an assessment process that uses academic knowledge picked directly from the material taught in the classroom. This form of criterion-referenced assessment connects evaluation with instructional programs by informing teachers of student progress and learning challenges. In this study a nationwide exam called Transition to Secondary School Exam TEOG Exam was used as a curriculum based tool since TEOG Exam is also second or third exam for semester. The data showed a one and a half year learning loss in both Turkish and mathematics based on Woesmann (2016)`s criteria. The difference in the scores for math exam between 2016 and 2020 was 10.32 points which accounts for half of exam standard deviation. Also, the difference in the scores for Turkish exam 2016 and 2020 was 10.91 points which is also around half of the standard deviation. Additionally, based on gender there was a statistically significant decrease of 12.04 points in the mathematics scores of girls and 8.43 points for boys showing a 15-month learning loss for girls. and a year of learning loss for boys. These results showed that girls had more learning losses due to COVID-19 pandemic. According to the mother's education level; the decrease for mathematics scores were between 9.73 (elementary school degree) and 22.02 points (associate degree). This finding shows that the learning loss in math based on mother educational level is between 15-months and 2.5 years. Similar findings showed up for Turkish scores as well. Turkish scores decreased between 10.43 (elementary school degree) and 22.24 points (associate degree). This finding shows that the learning loss in Turkish based on mother educational level is between 15-months and 2.5 years. These results show that some students did not learn new material after the outbreak and even slipped backwards. Ministry of National Education should take important steps to prevent the effects of COVID-19 pandemic and minimize and resolve the learning losses emphasized in this study.

Keywords: COVID-19, Curriculum Based Assessment, Learning Loss, School Closures, Social Inequality

Introduction

Recent global developments in the educational system have affected nations shockingly. This is directly related to the magnitude of the problem, number of people it affects, possible solutions and implementation timetable. The COVID-19 pandemic is not only a health crisis but also an educational crisis since there were some 1.5 billion kids without proper common schooling (World Bank, 2020) Natural or human-induced events affecting the masses can affect the lives of people and thus their education and training processes (Sarı & Nayır, 2020). Events such as natural disasters, wars, and epidemics may negatively affect the lives of large masses of people, and they can turn into a crisis in which the communities try to survive in a healthy way as soon as possible. An emergency solution must be developed at such times to overcome such crisis in the smoothest way to return to normal life routine.

Educational systems are also affected by mass crisis and learning losses may occur during such crisis depending on the magnitude of the problem. Learning loss can be expressed as the inability to retrieve acquired information from memory (Arı, 2005). Experiencing learning loss means going beyond the determined planning, not gaining or missing the desired competencies, and naturally experiencing problems reaching educational goals (Cooper et al 1996; Slade at al., 2017; Jaume & Willen 2018, Kayır & Özçelik, 2018).

* Corresponding Author: *Turker toker, tokerturker@hotmail.com*

Learning Losses due to Unplanned School Closures

The literature on school closures due to weather events and natural disasters gives us some insight into the potential impact of COVID -19 school closures, especially given that such closures occur unexpectedly and disrupt scheduled classes (Kuhfeld et al., 2020).Hansen's (2011) study shows that it decreases from 0.013 to 0.039 student days for each day that schools are closed due to snow in Colorado, and the effect of snow days on student achievement in Maryland varies between 0.013 and 0.016 student days. Additionally, Goldman (2014) found that school closures due to snowfall in Massachusetts did not affect mathematics and general reading achievement.
If education is interrupted for one or two days in a school year for unplanned reasons, teachers may make it easier to compensate for the lost time and therefore this may not affect student performance. However, longer periods of absence from school are likely to have greater effects on learning (Kuhfeld et al., 2020). In a recent study, even short-term incidents can cause large learning losses due to school closures. In 2020, Andrabi, Daniels, and Das found that when schools were closed in the region affected by the 2005 Pakistan earthquake for 3 months, there was a difference of 1.5 years, not 3 months, compared to those that were not affected after 4 years.
Research show that school closures occur within a limited time interval of 2 to 5 days during the year due to natural events (Marcotte & Hemelt, 2008). However, due to the COVID-19 pandemic, schools worldwide have been closed since March 2020, and as of the beginning of 2021, they still could not be opened properly. This is well higher than other unplanned school closures. Therefore, considering the other unplanned school closing periods, it is thought that it would be more beneficial to take a look at the studies examining the effect of summer holidays on learning losses, when students stay away from their schools for longer periods.

Summer Vacation Learning Losses

In general, summer learning loss is the event that students lose their academic knowledge and skills due to not going to school during summer holidays. Arı (2005) defined the concept of summer vacation learning loss as not remembering or having difficulty remembering what s/he learned in one school year at the beginning of the next academic year. When the researches are examined, learning losses ranging from 1 to 3 months are estimated and this process is affected according to class level, course subjects and socio-economic conditions (Cooper, 2003; Cooper, Nye, Charlton, Lindsay, & Greathouse, 1996; Entwisle & Alexander, 1992; Alexander et al., 2007). Although these losses are valid for most students, they show that students with low socio-economic status have more pronounced losses in reading (Cooper et al., 1996; Gershenson & Hayes, 2018).
Examining the literature on summer learning loss, we find that learning loss varies by socioeconomic level, parents' relationship status, the student's particular learning status, and the family's educational status. Among these, the most emphasized is the socio-economic level (Entwisle and Alexander, 1992, 1994; Cooper et al., 1996; Downey et al., 2004; Alexander et al., 2007; Slates et al., 2012; Gershenson, 2013; Arı, 2004; Gershenson and Hayes, 2013; Cooper, 2003; Menard & Wilson, 2014).
Specificially, in a meta-analysis study 39 studies examining summer holiday learning losses, revealed three common results regarding summer learning losses. These;

- Learning losses increase as the grade level rises.
- Losses in math skills are greater than learning.
- Learning loss in a summer term corresponds to an average of 1 month of teaching time (Cooper et al., 1996).

The literature on summer learning loss shows that students experience learning loss during summer vacation and that the extent of learning loss can vary depending on the educational level of the family, socioeconomic level, relationship status of the parents, and whether the student has learning difficulties.If education is interrupted for one or two days in a school year due to unplanned school closures, it is easier for teachers to compensate for the lost time and therefore, this may not affect student performance. However, longer periods of being away from school are likely to have greater effects on learning (Kuhfeld et al., 2020). However it is not only having a knowledge gap between what is planned and what is acquired by students, a greater concern is a snowball effect where learning losses become permanent due to the dynamic and spiral nature of curriculum, especially for kids from low-income families.
Determining the extent of learning loss and finding solutions are seen as important for the future of education systems around the world. To measure learning loss, students typically take two of the same standardized tests at different times. The tests used are compared to provide information about where students stand in comparison to peers in the same grade (Baker & Good, 1995). Results from these tests are used to determine how much learning loss might occur between two-time points.
Learning loss is mostly studied due to short-term effects of weather and climate events, natural disasters, strikes, and summer break. Students had no or little access to education in most of these scenarios. Due to nature of COVID-19 pandemic most countries have planned and implemented interventions where students can access education. As of March 16, 2020, Turkey closed all schools nationwide and implemented two different approaches

called EBA TV and eba.gov.tr (EBA stands for Educational Informatics Network), a television broadcast portal and an Internet portal for kids to access education. The reason to create both portals was to give access to the biggest number of students in the K-12 level. Along with that mobile EBA vehicles used to create access points for kids who live in rural areas of the country.

Curriculum Based Assessment (CBA)

Curriculum-based assessment (CBA) is an assessment process that uses academic knowledge picked directly from the material taught in the classroom. This form of criterion-referenced assessment connects evaluation with instructional programs by informing teachers of student progress and learning challenges. A key characteristic of CBA is that it provides a form of direct measurement where teachers assess precisely what they teach, which is not always the case with indirect or norm-referenced assessments that do not necessarily reflect the specific material covered in a particular classroom. Applications of CBA show that results provide stronger findings compared to traditional learning loss detection methods (Deno, Fuchs, Marston, & Shin, 2001; Fuchs, Fuchs, Hamlett, Walz, & Germann, 1993).
Deno and colleagues developed CBM at the University of Minnesota. According to the research team, CBM was designed to measure student progress, which can be used frequently. It also requires less effort to investigate student growth in learning (Deno, 1985, 1992). CBM was widely used in measuring oral reading (i.e., R-CBM; Busch & Reschly, 2007). CBM technique may assess the broad goals of the curriculum. Due to these broad goals compared to criterion-referenced achievement measures a greater overlap between teaching and testing than would be seen (Deno & Fuchs, 1987). Moreover, CBM is capable of multiple applications to produce comparative scores for students from different populations (Allinder, Fuchs, Fuchs, & Hamlett, 1992).

Current Study

The main purpose of this study was to determine the learning losses experienced by Turkish students in Turkish and mathematics lessons during the pandemic period and whether these losses differ according to gender, mother's education level via CBA. The literature mainly focuses on learning losses because of unplanned school closure due to weather or natural disasters and summer vacations. But a record number of children are not going to school because COVID -19 The pandemic has caused the greatest disruption to education systems in history. It is important to provide an overview to those interested in education around the world.The current study was well designed and followed a diverse sample of students from different socio-economic backgrounds, rural and urban areas to optimize results generalizability of the results.
Three main goals of the study were to:

1. To apply Curriculum-based assessment (CBA) to find evidence for possible learning losses,
2. To examine a sample of 8th graders for learning loss due to COVID-19 using raw test results, and
3. To assess the impacts of demographic factors on learning loss, such as gender and the mother's education level.

Method

Participants

The participants of this study were drawn from a mid-size city in Aegean Region of Turkey. Our study consists of 8th grade students who are from urban and rural areas where Internet connectivity and computer access might be limited. Some of the students excluded from analyses were missing a data point either due to not completing the test or marking all the answers but exiting the system in less than 15 minutes. The final sample consisted of 4.501 students from two different data points of 2016 TEOG Exam results and 2020 application of the same exam. Results of the demographic analysis about the sample is shown in Table 1. The total sample consisted of 2.355 girls and 2.180 boys. Another important variable, mother's education level, was differentiated as 3094 moms holding elementary (8 years) education, 969 moms with high school diplomas, 147 moms with associate degrees, and 291 moms with undergraduate degrees.

Table 1. Demographics of the Sample (N = 4.535)

Exam Year	Gender		Mother's Education Level			
	Girl	Boy	Elementary (8 Years)	High School	Associate Degree	Undergraduate
2016	1683	1603	2406	598	93	189
2020	657	558	688	371	54	102
Total	2355	2180	3094	969	147	291

Measure

In Turkey, a centralized standardized exam is used for transition to secondary education. Although there were different versions of transition exams in the past, Transition from Elementary Education to Secondary Education Examination (TEOG) had started from 2013-2014 academic year and ended in 2016-2017 academic year. In TEOG examination, eighth grade students used to take 12 centrally conducted examinations. The common examination subjects were Turkish, Mathematics, Science and Technology, T.R. Revolution History and Kemalism, Foreign Language, Religious Culture and Moral Knowledge. Due to focus of this study only results from Turkish and Mathematics subject areas of 2016 TEOG-1 exam were used. The exam took place on 23-24 November 2016. Although TEOG sounds like a standardized nationwide large scale exam since TEOG Exam is also second or third exam for mentioned subjects for the semester it can also be used as a curriculum based tool. In this study, the same exam from 2016 was adminestered to 8th grade students to determine the possible learning loss on 28 November 2020.

Data Analysis

Data were analyzed in several steps. First, data were screened for assumptions such as outliers and adherence to normality and parametric assumptions. Second, an independent samples t-test was run using test scores to see if there is a significant mean difference between 2016 and 2020. Later, a factorial ANOVA (two-way) analysis was conducted to compare TEOG results from 2016 and 2020 for gender and mother's education level. Analysis used the demographic variables of gender and mother's education level as between-subjects factors and the time of measurement (2016 - 2020) as within-subjects factor.
Studies have shown that demographic variables have strong effect on learning loss. As a result, since gender has strong effect on academic performance it was hypothesized that the variable might have similar effect on learning loss (Sadler-Smith, 1996; Dayioğlu et. al., 2007; Chyung, 2007). This was an important finding of a meta-analysis study conducted by Sirin in 2005. Mother's education level was selected due to being a strong predictor of school performance.

Results and Discussion

Data Screening and Testing for Assumptions
The factorial ANOVA has several assumptions that need to be met:

- interval data of the dependent variable,
- normality,
- homoscedasticity,
- and no multicollinearity.

In this study dependent variable is at the interval level. Data were analyzed to see possible outliers. There were no outliers as a threat to analysis. The distributions of the dependent variables—Math and Turkish scores at each time point—were examined for normality. Z-scores of skewness and kurtosis were less than the absolute value of 1.9, meaning that, there were no significant distributional deviation (Field, 2009). In addition to this, histograms, boxplots, and descriptive statistics were checked. Results showed that the variables' distributions were normal. Means, standard deviations, and ranges for 2016 and 2020 TEOG scores for each group are given in Table 2.

Table 2. Descriptive Statistics for Student Scores (N = 4.535)

			Range		
Exam Year	Mean (SD)	Skewness	Kurtosis	Minimum	Maximum
2016					
Mathematics	57.90 (23.11)	.143	-1.092	5.00	100.00
Turkish	62.97 (19.60)	-.065	-.669	5.00	100.00
2020					
Mathematics	47.58 (22.53)	.143	-.659	0.00	100.00
Turkish	52.06 (21.07)	-.065	-.528	0.00	100.00

Levene's test for equality of error variances was used to test whether the error variances of all data points of the dependent variable were equal or homogeneous across the sample. Levene's test was not significant at the p >.01 level. Moreover, the observations were mutually independent. According to the test results, the assumptions of the analysis were met.

Results of Independent Samples t-test

A t-test was conducted to compare means of both math and Turkish scores of two-time points (Table 3). There was a significant difference between the 2016 and 2020 results, showing that the 2020 students' results were lower than the 2016 results.Table 3. Results of Independent Samples t-test Analysis Examining the Learning Loss Due to COVID-19

	2016		**2020**		**Mean**	***t* (4533)**	***p***	**Cohen's *d***
	M	***SD***	***M***	***SD***	**Difference**			
Mathematics	57.90	23.11	47.58	22.53	10.32	13.48	.000	0.45
Turkish	62.97	19.60	52.06	21.07	10.91	16.33	.000	0.54

The difference in the scores for math exam 2016 (*M*=57.90, *SD*=23.11) and 2020 (*M*=47.58, *SD*=22.53) conditions; *t* (4533)=13.48, *p* = 0.000. Also the difference in the scores for Turkish exam 2016 (*M*=62.97, *SD*=19.60) and 2020 (*M*=52.06, *SD*=21.07) conditions; *t* (4533)=16.33, *p* = 0.000. The effect size for math exam analysis (*d* = .45) was found to exceed Cohen's (1988) convention for a small effect (*d* = .20) and for Turkish exam analysis (*d* = .54) was found to exceed Cohen's (1988) convention for a medium effect (*d* = .50).

Results of Factorial ANOVA

A Factorial ANOVA was conducted to compare the main effects of gender and year of the test and the interaction effect between gender and year of the test on students` math scores. There was a statistically significant interaction between gender and the year of the exam on students` math scores. F (1, 4497) = 5.520, p = .019.

Table 4. Results of Independent Groups Factorial ANOVA Examining the Learning Loss Due to COVID-19 for Mathematics Exam (Gender vs. Year of Exam)

Source	***df***	**MS**	***F***	***p***	η^2
Exam Year	1	92392.339	177.238	.000*	.038
Gender	1	4058.746	7.786	.005*	.002
Exam Year x Gender	1	2877.642	5.520	.019*	.001
Error	4497	521.291			

Note.—MS = Mean squares, η2 = effect size, *p < .05

Simple main effects analysis showed that girls had significantly more learning losses in math than boys (p = .002).

Table 5. Means for Learning Loss Due to COVID-19 for Mathematics Exam (Gender vs. Year of Exam)

Mathematics	**2016**		**2020**		
	M	***SD***	***M***	***SD***	**Mean Difference**
Girl	59.72	22.91	47.68	21.66	12.04
Boy	55.77	23.04	47.34	23.28	8.43

Another Factorial ANOVA was conducted to compare the main effects of gender and year of the test and the interaction effect between gender and year of the test on students` Turkish scores. There was no statistically significant interaction between the effects of gender and year of the exam on students` Turkish scores *F* (1, 4497) = 3.279, *p* = .070.

Table 6. Results of Independent Groups Factorial ANOVA Examining the Learning Loss Due to COVID-19 for Turkish Exam (Gender vs. Year of Exam)

Source	***df***	**MS**	***F***	***p***	η^2
Exam Year	1	105668.357	272.635	.000*	.057
Gender	1	30843.311	79.579	.000*	.017
Exam Year x Gender	1	1254.689	3.237	.072	
Error	4497	387.582			

Note.—MS = Mean squares, η2 = effect size, *p < .05

A third Factorial ANOVA was conducted to compare the main effects of mother's education level and year of the test and the interaction effect between mother's education level and the year of the test on students` math scores. There was a statistically significant interaction between the effects of mother's education level and the year of the exam on students` math scores. F (1, 4493) = 9.057, p = .000.

Table 7. Results of Independent Groups Factorial ANOVA Examining the Learning Loss Due to COVID-19 for Mathematics Exam (Mother's Education Level vs. Year of Exam)

Source	***df***	**MS**	***F***	***p***	η^2
Exam Year	1	82888.812	181.315	.000*	.039
Gender	3	73060.954	159.817	.000*	.096
Exam Year x MomsEducation	3	4140.524	9.057	.000*	.006
Error	4493	457.153			

Note.—MS = Mean squares, η2 = effect size, *p < .05

Simple main effects analysis showed that kids whose mothers eld an associate degree had more learning losses in math than the rest (MD= 22.02) (see Table 8).

Table 8. Means for Learning Loss Due to COVID-19 for Mathematics Exam (Mother's Education Level vs. Year of Exam)

Mathematics	**2016**		**2020**		
	M	**SD**	**M**	**SD**	**Mean Difference**
Elementary (8 Years)	53.10	21.66	43.37	21.19	9.73
High School	65.49	21.55	48.63	21.52	16.86
Associate Degree	78.87	18.53	56.85	22.51	22.02
Undergraduate	82.86	17.94	66.72	21.95	16.14

A fourth Factorial ANOVA was conducted to compare the main effects of mother's education level and year of the test and the interaction effect between mother's education level and year of the test on students` Turkish scores. There was a statistically significant interaction between the effects of mother's education level and year of the exam on students` Turkish scores. F (1, 4493) = 7.645, p = .024.

Table 9. Results of Independent Groups Factorial ANOVA Examining the Learning Loss Due to COVID-19 for Turkish Exam (Mother's Education Level vs. Year of Exam)

Source	**df**	**MS**	***F***	***p***	η^2
Exam Year	1	79652.570	222.654	.000*	.047
Gender	3	44034.638	123.091	.000*	.076
Exam Year x MomsEducation	3	2734.767	7.645	.000*	.005
Error	4493	357.741			

Note.—MS = Mean squares, η2 = effect size, *p < .05

Simple main effects analysis showed that kids whose mothers eld an associate degree had more learning losses in math than the rest (MD= 22.24) (see Table 10).

Table 10. Means for Learning Loss Due to COVID-19 for Turkish Exam (Mother's Education Level vs. Year of Exam)

Turkish	**2016**		**2020**		
	M	***SD***	***M***	***SD***	**Mean Difference**
Elementary (8 Years)	59.26	18.70	48.83	20.48	10.43
High School	68.48	18.52	52.89	19.02	15.59
Associate Degree	81.12	12.94	58.88	20.36	22.24
Undergraduate	82.14	15.61	66.91	23.49	15.23

Conclusion

When the pandemic COVID -19 led to school closures, many of us had no idea that this disruption would last months and perhaps more than a year. However, when this study was conducted, access to personal education in Turkey had not been provided in a healthy and usual manner for about 10 months, including the summer vacations. However, education in Turkey is a pathway for transition between social classes. Especially the children of families living in lower socio-economic strata use education to change their social class. At this point, access to education is critical for the children of disadvantaged families.

In this study, following analysis were done by using the Turkish and Mathematics data of the 2016 TEOG exam to reveal a possible learning loss:

1. Examine a sample of 8th graders for learning loss due to COVID-19 using raw test results, and
2. assess the sample if there is evidence of learning loss based on demographic factors, such as gender, mother's education level.

When COVID -19 began to spread rapidly in the spring, our educational system was quite lacking in the equipment and infrastructure to respond to it. The Turkish National Education System, or more accurately its ecosystem has been built around a school and classroom-based experience. In many homes, especially for socio-economically disadvantaged families, students have limited access to the internet, devices, and even a quiet place reserved to study.

For this reason, inequalities in learning conditions were directly reflected in the results obtained in this study.

Research Q1

The data showed that there was a one and a half year learning loss in both Turkish and mathematics based on Woesmann (2016)`s findings. According to Woesmann (2016), in national and international standardized large-scale exams, one-year learning corresponds to a value between one-fourth and one-third of the standard deviation of the exam. The difference in the scores for math exam between 2016 and 2020 was 10.32 points which accounts for half of exam standard deviation. Also, the difference in Turkish exam 2016 and 2020 was 10.91 points which is also around half of the standard deviation. This may seem reasonable in a storm that is caught unprepared, but learning losses increase up to two or three years of education in disadvantaged groups, which was subgrouped based on mother`s education level, is an important finding.

Research Q2

In this study, gender and mother`s educational level to compare learning losses based on demographic factors. Based on gender there was a statistically significant decrease of 12.04 points in the mathematics scores of girls and 8.43 points for boys showing a 15-month learning loss for girls. and a year of learning loss for boys. These results indicated that girls had more learning losses due to the COVID-19 pandemic.

According to the mother's education level; the decrease for mathematics scores were between 9.73 (elementary school degree) and 22.02 points (associate degree). This finding shows that the learning loss in math based on mother educational level is between 15-months and 2.5 years. Similar findings showed up for Turkish scores as well. Turkish scores decreased between 10.43 (elementary school degree) and 22.24 points (associate degree). This finding shows that the learning loss in Turkish based on mother educational level is between 15-months and 2.5 years.

Research emphasize that family`s educational status helps children to have less learning losses (Entwisle and Alexander, 1992, 1994; Cooper et al., 1996; Downey et al., 2004; Alexander et al., 2007; Slates et al., 2012; Gershenson, 2013; Arı, 2004; Gershenson and Hayes, 2013; Cooper, 2003; Menard & Wilson, 2014). However findings of this study show that kids with mothers holding higher educational degrees have more learning losses. COVID-19 pandemic closures affected schools most but businesses and factories mainly were open in Turkey. Ministry of National Education`s efforts to minimize the effects of the pandemic was mostly based on TV programs through EBA TV. Since mothers with higher educational degree were at work during these times and mothers with lower educational degrees were at home kids with more educated mothers had more learning losses. Specifically, mothers holding associate degrees were hired at factories in Usak meaning that their kids have the higher learning losses.

However, these results are only a snapshot of a small section of the students. Considering the social, demographic and cultural structure of Usak, it can be regarded as that these students perform better than the national averages.

Recommendations

These assessments were obtained by administering the 2016 TEOG exam to students with internet access online in 2020 on similar dates. These results show that some students did not learn new material after the outbreak and

even slipped backwards. Ministry of National Education should take the following steps to prevent effects of COVID-19 pandemic as well as minimize and resolve the learning losses emphasized in this study.

- Schools should be maintained in a way to provide face-to-face education. This is because the problems experienced in accessing the internet, software and hardware are at the root of the learning losses experienced.
- To compensate for the pandemic learning loss, comprehensive, accessible and effective strategies should be developed to cover cognitive, affective and social learning losses.

Acknowledgements or Notes

This paper is part of a research effort with many contributing participants; the author has organized this particular work, but the entire team should give substantive credit.

References

Alexander, K. L., Entwisle, D. R., & Olson, L. S. (2007). Lasting consequences of the summer learning gap. *American Sociological Review*, *72*(2), 167-180. https://doi.org/10.1177/000312240707200202

Allinder, R. M., Fuchs, L. S., Fuchs, D., & Hamlett, C. L. (1992). Effects of summer break on math and spelling performance as a function of grade level. *The Elementary School Journal*, *92*, 451– 460.

Andrabi, T., Daniels, B., & Das, J. (2020). Human capital accumulation and disasters: Evidence from the Pakistan earthquake of 2005. https://doi.org/10.35489/bsg-risewp_2020/039

Arı, A. (2004). Yaz tatili öğrenme kaybı konusunda öğretmen görüşleri. *Milli Eğitim Dergisi,*, *163*(91), 103. http://dhgm.meb.gov.tr/yayimlar/dergiler/milli_egitim_dergisi/163/ari.htm

Arı, A. (2005). *İlköğretim okulu öğrencilerinin yaz tatilindeki öğrenme kayıpları (* [Unpublished doctoral dissertation]. Gazi University.

Baker, S. K., & Good, R. (1995). Curriculum-based measurement of English reading with bilingual Hispanic students: A validation study with second-grade students. *School Psychology Review*, **24**, 561– 578.

Baker, S. K., & Good, R. (1995). Curriculum-based measurement of English reading with bilingual Hispanic students: A validation study with second-grade students. *School Psychology Review*, *24*(4), 561-578. https://doi.org/10.1080/02796015.1995.12085788

Busch, T. W., & Reschly, A. L. (2007). Progress Monitoring in Reading: Using Curriculum-Based Measurement in a Response-to-Intervention Model. *Assessment for Effective Intervention*, *32*(4), 223–230. https://doi.org/10.1177/15345084070320040401

Cooper, H. M. (2003). *Summer learning loss: The problem and some solutions*. Champaign, IL: ERIC Clearinghouse on Elementary and Early Childhood Education.

Cooper, H., Nye, B., Charlton, K., Lindsay, J., & Greathouse, S. (1996). The effects of summer vacation on achievement test scores: A narrative and meta-analytic review. *Review of Educational Research*, *66*(3), 227-268. https://doi.org/10.3102/00346543066003227

Dayioğlu, M., & Türüt-Aşik, S. (2007). Gender differences in academic performance in a large public university in Turkey. *Higher Education*, *53*(2), 255-277. https://doi.org/10.1007/s10734-005-2464-6

Deno, S. L. (1985). Curriculum-Based Measurement: The Emerging Alternative. *Exceptional Children*, *52*(3), 219–232. https://doi.org/10.1177/001440298505200303

Deno, S. L., & Fuchs, L. S. (1987). Developing curriculum-based measurement systems for data-based special education problem solving. *Focus on Exceptional Children*, *19*(8).

Downey, D. B., von Hippel, P. T., & Broh, B. (2004). Are schools the great equalizer? School and non-school sources of inequality in cognitive skills. *American Sociological Review*, *69*(5), 613-635. https://www.jstor.org/stable/3593031

Gershenson, S. (2013). Do summer time-use gaps vary by socio-economic status?. *American Educational Research Journal*, *50*(6), 1219-1248. https://doi.org/10.3102/0002831213502516

Gershenson, S., & Hayes, M. S. (2018). The implications of summer learning loss for value-added estimates of teacher effectiveness. *Educational Policy*, *32*(1), 55-85. https://doi.org/10.1177/0895904815625288

Hansen, B. (2011). School year length and student performance: Quasi-experimental evidence. *Available at SSRN 2269846*.

Kuhfeld, M., Soland, J., Tarasawa, B., Johnson, A., Ruzek, E., & Liu, J. (2020). Projecting the potential impact of COVID-19 school closures on academic achievement. *Educational Researcher*, *49*(8), 549-565. https://doi.org/10.3102/0013189x20965918

Fuchs, L. S., Fuchs, D., Hamlett, L. C., Walz, L. & Germann, G. (1993). Formative Evaluation of Academic Progress: How Much Growth Can We Expect?, *School Psychology Review*, *22*:1, 27-48, https://doi.org/10.1080/02796015.1993.12085636

Marcotte, D. E., & Hemelt, S. W. (2008). Unscheduled school closings and student performance. *Education Finance and Policy*, *3*(3), 316-338. https://doi.org/10.1162/edfp.2008.3.3.316

Menard, J., & Wilson, A. M. (2014). Summer learning loss among elementary school children with reading disabilities. *Exceptionality Education International*, *23*(1). https://doi.org/10.5206/eei.v23i1.7705

Sadler Smith, E. (1996). Approaches to studying: Age, gender and academic performance. *Educational Studies*, *22*(3), 367-379. https://doi.org/10.1080/0305569960220306

Sirin, S. R. (2005). Socio-economic status and academic achievement: A meta-analytic review of research. *Review of Educational Research*, *75*(3), 417-453. https://doi.org/10.3102/00346543075003417

Slates, S. L., Alexander, K. L., Entwisle, D. R., & Olson, L. S. (2012). Counteracting summer slide: Social capital resources within socioeconomically disadvantaged families. *Journal of Education for Students Placed at Risk (JESPAR)*, *17*(3), 165-185. https://doi.org/10.1080/10824669.2012.688171

Deno, L. S. (1992). The Nature and Development of Curriculum-Based Measurement, Preventing School Failure: *Alternative Education for Children and Youth*, *36*:2, 5-10, https://doi.org/10.1080/1045988X.1992.9944262

Stanley L. Deno, Lynn S. Fuchs, Marston, D. & Shin J. (2001). Using Curriculum-based Measurement to Establish Growth Standards for Students with Learning Disabilities, *School Psychology Review*, *30*:4, 507-524, https://doi.org/10.1080/02796015.2001.12086131

Woessmann, L. (2016). The economic case for education. *Education Economics*, *24*(1), 3-32. https://doi.org/10.1080/09645292.2015.1059801

World Bank, 2020. The COVID-19 Pandemic: Shocks to Education and Policy Responses. May 2020 Available: https://openknowledge.worldbank.org/bitstream/handle/109 86/33696/148198.pdf.

Article History
Received: 16.10.2021
Received in revised form: 08.12.2021
Accepted: 23.01.2022
Article Type: Research Article

International Journal of Contemporary Educational Research (IJCER)

www.ijcer.net

Effect of Problem-Based STEM Activities on 7th Grade Students' Mathematics Achievements, Attitudes, Anxiety, Self-Efficacy and Views

Yavuz Macun[1], Cemalettin Işık[2]
[1]Ministry of National Education, 0000-0003-4983-2601
[2]Erciyes University, 0000-0001-6326-0043

To cite this article:

Macun, Y., & Işık, C. (2022). Effect of problem-based STEM activities on 7th grade students' mathematics achievements, attitudes, anxiety, self-efficacy and views. *International Journal of Contemporary Educational Research, 9*(1), 87-102. https://doi.org/10.33200/ijcer.1008456

International Journal of Contemporary Educational Research

Volume 9, Number 1, March 2022, 87-102 ISSN: 2148-3868

Effect of Problem-Based STEM Activities on 7th Grade Students' Mathematics Achievements, Attitudes, Anxiety, Self-Efficacy and Views*

Yavuz Macun[1], Cemalettin Işık[2]**
[1]Ministry of National Education
[2]Erciyes University

Abstract

This study investigates the effect of problem-based STEM (Science, Technology, Engineering, Mathematics) activities on 7th-grade students' mathematics achievement, attitude, anxiety, self-efficacy, interest, and views. At the same time, the effects of these activities on students' anxiety, self-efficacy towards mathematics, and interest in STEM occupations were also examined. The study sample, which was selected using the convenience sampling method, consisted of 115 7th grade students of a public middle school in Turkey. In the quantitative phase of the research, a quasi-experimental research model with pre-test and post-test control group was used to determine the students' mathematics achievement, attitudes, anxiety, self-efficacy towards mathematics and interests in STEM careers. In the qualitative phase semi-structured interview was used to understand students' views on problem-based STEM activities and mathematics lessons in the qualitative part. Within the scope of the research, 6 different problem-based STEM activities related to ratio-proportion and percentages were applied to the experimental group students. The data collected from both groups before and after the implementation process were analyzed with descriptive statistics, independent samples t-test, and paired sample t-test. The results showed that problem-based STEM activities affect students' mathematics achievement, self-efficacy, and interest in mathematics. It also helps students reducing their mathematics anxiety.

Keywords: STEM, Self-efficacy towards mathematics, 21st Century skills, Mathematics achievement, Problem-Based STEM activities and interest.

Introduction

Technological changes and innovations have influenced industry from the past to the present and these developments have been called industrial revolutions. The first industrial revolution emerged with mechanical systems operating with water and steam power and the first mechanical weaving loom started to be used in 1784. Afterwards, systems that opened the doors of the second industrial revolution and mass production by utilizing electrical energy were invented. In this context, the moving belt system was used in slaughterhouses in 1870 (Yıldız, 2018). Then, the third industrial revolution began with the development of information systems and technologies and the emergence of programmable management systems that allow less use of workforce. Finally, fourth industrial revolution, or "Industry 4.0" by its popular name, originated and continues with the use of cyber-physical systems (manufacturing techniques + information and communication technology + internet). All these industrial revolutions have affected the production itself and the labor market and education systems (Benešová and Tupa, 2017). As a result of these changes, some jobs and occupations have disappeared and new ones have emerged. As a requirement of Industry 4.0, an emphasis has placed on the skills that individuals need to possess, and countries have started to change and develop their education systems accordingly.

Science, Technology, Engineering, Mathematics [STEM] education is an integrated education approach resulting from these industrial developments and includes integrated teaching of science, technology, engineering and mathematics and takes place in all levels of education system (Sanders, 2009). STEM, which is a concept that is frequently mentioned worldwide, is being implemented in education systems in different countries to gain the 21st century skills that future generations must have considered Industry 4.0. Researchers generally define 21st century skills as adapting to a different situation, having effective communication skills, solving different kinds

* This study was produced from Yavuz Macun's master's thesis and was funded by the Erciyes University Scientific Research Projects Unit with the project code SYL-2019-8749
** Corresponding Author: *Yavuz Macun, yavuzmacun@gmail.com*

of problems, having self-management and self-development skills, and analytical thinking within existing systems (Windschitl, 2009; Bybee, 2010). To improve students' knowledge, skills and competencies, significant studies have been initiated around the world. Accordingly, STEM has become the state's educational policy in the United States of America [USA]. For this purpose, to increase student participation in STEM activities and attract students' attention to STEM professions, a program called "Education to Innovate" was implemented in the USA (Obama, 2009). In this way, it will be possible to raise generations who will keep up with the rapidly changing technological developments and have the knowledge and skills required by the era. There is also increasing interest and demand for STEM in Turkey. The General Directorate of Innovation and Educational Technologies of the Ministry of National Education [MoNE] published a STEM Education Report in 2016 and a STEM Education Teacher Handbook in 2017. In the STEM Education Report, a model proposal was made for the transition to STEM education in Turkey, topics such as establishing STEM Education Centers, conducting STEM Education research, training teachers for a STEM education approach, updating educational programs according to STEM, and providing course materials necessary to create STEM education environments in schools were highlighted (MoNE, 2016; 2017). In addition, STEM research is carried out by STEM centers established within the body of Middle East Technical University and Bahçeşehir University. Turkish Industrialists' and Businessmen's Association (TÜSİAD) draws attention to STEM education at every opportunity. With its report "STEM Needs in Turkey Towards 2023" published in 2017, it both emphasizes the importance of STEM education and makes recommendations for STEM education in Turkey (TÜSİAD, 2017). These interests and studies on STEM education will bring a new perspective to the Turkish education system, moving towards being exam-oriented. Teachers who are monotonous in the education system generally do not pay enough attention to students' interests and thoughts. Together with STEM, teachers will create learning environments that address multiple disciplines and allow students to use different types of intelligence.

In recent years, STEM education has played an important role in educational researchers and economic competition. Furthermore, the relationship between labor and STEM fields is emphasized and the importance of encouraging and preparing future generations to choose these fields is highlighted. According to Yıldırım (2013), STEM education is an approach that encourages students to learn directly and enables them to reach their dreams and to transfer this learning to new and different problems. Moreover, the need for individuals to develop and use these skills in daily life, which are expressed in different terms in the literature, increases the importance of STEM literacy. Studies show students welcome integrated STEM activities and believe such courses are helpful in solving problems in daily life (McBride & Silverman, 1991; James, 2014; Aydagül & Terzioğlu, 2014; Çorlu, Capraro, & Capraro, 2014; Hefty, 2015; McClain, 2015). In this context, it is thought that the problem-based activities with the integration of science, technology, engineering and mathematics will be beneficial in examining the contribution of STEM literacy and the academic success, attitudes, anxiety and self-efficacy of students in these areas. For this purpose, we want to answer to the following research problems and sub-problems.

Research Questions

Do the problem-based STEM activities impact the mathematics achievement, attitudes, and views of 7th-grade students in the teaching of ratio-proportion and percentages?
Regarding this problem, we sought answers to the following sub-research questions:

1. What is the effect of problem-based STEM activities on 7th-grade students' math achievement?
2. What is the effect of problem-based STEM activities on 7th-grade students' attitude toward mathematics?
3. What is the effect of problem-based STEM activities on 7th-grade students' self-efficacy in mathematics?
4. What is the effect of problem-based STEM activities on 7th-grade students' anxiety in mathematics?
5. What is the effect of gender on the variables of the other sub-research questions?

Literature Review

When we examined the studies about STEM, we saw that these studies mostly focus on the importance of STEM education. Almost all of the researches on STEM education conducted with teachers, prospective teachers and primary/middle school students about science course while there are very few studies on mathematics (Rogers & Portsmore, 2004; Kennedy & Odell, 2014; Şahin, Ayar & Adıgüzel, 2014; James, 2014; McClain, 2015; Balbağ & Yenilmez, 2016; Gökbayrak & Karışan, 2017b; Delen & Uzun, 2018; Doğanay, 2018). Most of the research on teachers is conducted as an experimental study or intended to determine teachers' views and opinions who have previously participated in STEM training. In the researches with primary and middle school students, the impact of the activities applied using STEM education on the students' academic achievements and attitudes towards science, problem solving and scientific process skills and coding learning was examined. Rogers and Portsmore

(2004) stated that incorporating engineering into the primary education curriculum provides students with ways to connect, apply and reinforce their knowledge of mathematics, science and design; also, it is possible to develop a new discipline that will be the basis for K-12 education by developing new classroom tools and additional curricula. Kennedy and Odell (2014) highlighted the importance of STEM education in globalized economic competition and emphasized the need for a good curriculum and evaluation process to involve students in high-quality STEM education. The study by Şahin, Ayar and Adıgüzel (2014) examined students' characteristics, experiences, and achievements in an after-school program at a private school in Southeast U.S. According to the research findings, these activities included open-ended studies involving collaborative scientific discoveries in STEM fields and enabling students to use different 21st century skills.

When the studies conducted for STEM students are examined, we saw that STEM's effect on science academic achievement, students' views on STEM activities and STEM fields are mostly discussed. In a quantitative study by James (2014), data analyses show that students taking traditional math and science courses experience significantly greater academic achievement and growth than students enrolled in STEM courses in both mathematics and science. McClain's (2015) quantitative study's findings show that STEM education can improve student achievement in standard assessments. Similarly, the study by Gökbayrak and Karışan (2017b) shows that students benefit from different aspects of STEM activities and wish to develop themselves more in the fields of Science, Technology, Engineering and Mathematics. In addition, they considered that the courses would be more beneficial for them if they were processed with STEM activities. Finally, Doğanay's (2018) study shows that the educational process including problem-based STEM activities made a significant difference in the academic achievement and science attitudes of the elementary students according to the constructivist training process.

In summary, when examining the studies in the literature, it was found that most of these studies determine the characteristics of STEM education, the studies conducted within STEM education, the attitudes of teachers and prospective teachers toward STEM education, and the attitudes and opinions of students toward STEM, while there are very few studies that examine academic achievement.

Method

Research Design

In this study, quantitative techniques have applied to understand the effect of STEM teaching methods on student achievement, attitude, anxiety and self- efficacy. Among the quantitative techniques, descriptive and semi-experimental research model with pre-test and post-test control groups were used to determine the students' academic achievement, attitude, anxiety and self-efficacy of the mathematics course. The survey research aims to show the characteristics of the current situation in the research subject in general and to provide a description (Büyüköztürk, Çakmak, Akgün, Karadeniz and Demirel, 2013). In this context, the relevant scales were applied to the students as pre-test and post-test, and the numerical data was analyzed in terms of some variables and then, generalizations were ended about the group. According to Fraenkel and Wallen (2010), the issue is how the data are distributed among the individuals in the sample rather than why the data obtained in the surveys were generated.

Sample

The sample of the study selected using convenience sampling method consists of 115 students attending the 7th grade of a public middle school in Turkey. Since the one dimension of the study was about observing students' participation and attitudes towards the course, we preferred such a sampling method after obtaining the necessary legal permissions to conduct the course content and lesson plan in a healthy way. In doing so, experimental and control groups were created by providing an intact classroom environment. You can see the frequency values of the participants in Table 1 below.

Table 1. Frequency values of students in experimental and control groups

Group	Gender	*f*	%	Total	%
Experimental	Female	22	46.8	47	40.9
	Male	25	53.2		
Control	Female	43	63.2	68	59.1
	Male	25	36.8		
Total	Female	65	56.5	115	100
	Male	50	43.5		

The mathematics grades of the 7th grade students from the previous classes were obtained from the online grade database of the school to form the experimental and control groups. The mathematics scores' means of the students were analyzed by independent samples t-test to form experimental and control groups. As a result of independent samples t-test, we saw that there was no statistically significant mean difference between the math grades of experimental ($\overline{X}$ = 74.22) and control ($\overline{X}$ = 76.85) groups at .05 level [t (113) = -1.07, p = .29]. In other words, the experimental and control groups are equal in mathematics achievement and the groups are formed appropriately according to the purpose of the research.

Data Collection Tools

Short Form for Attitude Scale towards Mathematics (SFASTM)

The short form of Attitude Towards Mathematics Inventory (ATMI) developed by Tapia and Marsh (2004), adapted by Lim and Chapman (2013) and in which Hacıömeroğlu (2017) performed the validity and reliability study performed the validity and reliability study in Turkish was used by obtaining the necessary permissions to determine the change in 7th grade students' attitudes towards mathematics. SFASTM consists of 17 items and has a Cronbach's Alpha value of 0.84.

Math Anxiety Scale for Middle School Students (MASMSS)

MASMSS developed by Bindak (2005) to measure the level of mathematics anxiety of elementary school students, was made up of as few items as possible by the researcher so that elementary school students did not take much time to answer. The primary purpose of the study was to prepare a scale that would facilitate the application and response of elementary school students. The scale was originally created with 16 items, then was reduced to 10 items due to factor analysis, and the reliability coefficient of the scale was calculated by Bindak (2005) to be 0.84. In this scale, where students' scores vary from 10 to 50, mathematics anxiety increases as the total score increases, and mathematics anxiety decreases as the total score decreases.

Self-Efficacy Perception Scale for the Middle School Students (SEPSMSS)

To measure 7th grade students' mathematics self-efficacy perception levels, we used the SEPSMSS, developed by Umay (2001), consisting of 14 items and has a reliability coefficient of 0.88. In factor analysis, self-perception/self-confidence (items 3, 10, 11, 12 and 13) of mathematics, awareness of mathematics topics and behaviors (items 4, 5, 6, 7, 8 and 9) to be able to transform mathematics into life skills (items 1, 2 and 14 were found to be collected in three factors.

STEM Career Interest Scale (STEM-CIS)

In order to measure 7th grade students' interest in STEM professions, we used the STEM-CIS, developed by Kier, Blanchard, Osborne, and Albert (2014), adapted to Turkish by Koyunlu Ünlü, Dökme and Ünlü (2016) and consisting of 40 items. The researchers calculated Cronbach's Alpha reliability coefficient as 0.93 of the scale adapted to Turkish. Also, Cronbach's Alpha reliability coefficient of the sub-fields was calculated as 0.86 for science, 0.88 for technology, 0.94 for engineering and 0.90 for mathematics.

Ratio-Proportion and Percentages Achievement Test (RPPAT)

It was developed by the researchers taking expert opinions were applied to experimental and control group students as pre-test and post-test. You can see the reliability values of data obtained from these scales from Table 2.

Table 2. Reliability values of the pre-test and post-test data

Scale	Pre-Test Cronbach's Alpha	Post-Test Cronbach's Alpha	Number of Items
SFASTM	.88	.93	17
MASMSS	.85	.88	10
SEPSMSS	.84	.88	14
STEM-CIS	.90	.93	40
Mathematics	.85	.91	10
Science	.90	.92	10
Technology	.83	.88	10
Engineering	.92	.93	10
RPPAT	.73	.86	10

Reliability test shows that the results obtained by applying all the scales used in the pre-tests and post-tests of the research are within the acceptable range (at least .70) for reliability (Morgan et al., 2004).

Data Collection Process

After students in the experimental and control groups completed the pretests of all scales, the lesson plans, which included six different problem-based STEM activities, were used for two months as a treatment for students in the experimental group to teach ratios and percentages. Among the special objectives of the mathematics course curriculum are students' understanding of mathematical concepts and their ability to use these concepts in daily life (MoNE, 2018b). In this context, ratio-proportion and percentages have a great place in connecting with daily life. The fact that these subjects are related to other mathematics subjects further increases the importance of this situation. Therefore, ratio-proportion and percentages topics were chosen to apply problem-based STEM activities in the research, both because of its connection with daily life and because it requires mathematical, proportional and critical thinking skills. To carry out the teaching programs based on STEM activities for teachers, they must first prepare lesson plans following this philosophy. According to Ramaley (2007), the implementation of STEM-based activities in the classroom environment can only be achieved by preparing mathematics and science education programs, where technology and engineering are integrated within the framework of the lesson plans. Teaching programs that include these activities can enable students to embody what they have learned and connect with everyday life and increase their motivation in math and science classes. When the lesson plans created within the context of STEM are examined, it is seen that the course is built on a knowledge-based life problem (Çorlu and Çallı, 2017). In these lesson plans, the targeted achievements of each STEM discipline, the materials to be used, the problem situation and the course process are clearly stated. In addition, some of the lesson plans include the professional group targeted by the applied activities and the characteristics of this profession. We prepared five lesson plans: gear wheels, speed-time-path, elevator construction, bridge model and nutritional values. We created these lesson plans by consulting the opinions of different experts. Afterwards, we applied each lesson plan for a week (5 lesson hours per week) in the classroom with the students in the experimental group. Here we share the content and processing process of a lesson plan to give you an idea.

Subject:	Ratio - Proportion	**Grade:**	7th
Duration:	5 hours		
Objectives:	**Mathematics:** • Determines the value that the other will receive if one of the multiplexes in the ratio is 1. • When one of the two multiplicities given the ratio to each other is given, finds the other. • Decides whether two multiplicities are proportional by examining real-life situations. • Expresses the relationship between two directly proportional multiplicities. **Sciences:** • Defines speed and expresses its unit. • Shows the relationship between path, time and speed on the graph. **Technology:** • Develops an understanding of the features and scope of technology. • Develops an understanding of the features of design. • Understands the basic concepts of technology. • Understands the relationships between technologies and develops connections between technology and other fields. **Engineering:** • Understands the working principle of motor vehicles.		
Teaching Method:	Questioning-answering, discussion, group working, brainstorming		
Tools and Equipment:	GeoGebra dynamic geometry software, toy cars, toy racetrack of different length, paper, pencil		

Figure 1. Example of the lesson plan about "Speed, Time, and Path"

One of the lesson plans prepared and used for the research was speed, time and path. You can see the objectives, teaching methods, tools and materials used in this lesson plan in Figure 1. The teacher completed the lesson preparation process by asking the following questions to the students. "What are the factors affecting the travel time?", "What criteria are important in calculating speed?", and "Which variable increases or decreases as time increases at constant speed?" Then, students are divided into groups of two and each group chooses a pull-back toy car. Students were given previously prepared ropes of different lengths and colours.

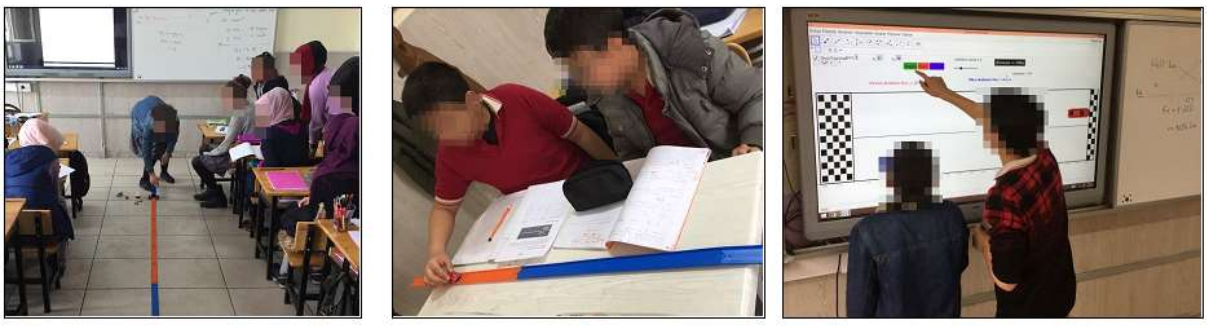


Figure 2. Classroom photos showing the process of the lesson plan about "Speed, Time, and Path"

As shown in Figure 2, the teacher asked each group to pull and drop the pull-back toy cars at the length of the ropes, respectively, and record the data they have obtained. As a result of the experiment, the students who completed the table were able to understand the basic principle of the formula x=v.t and how the others change when one variable is held constant. In the last part, the students were divided into four groups and tried to predict the result of the experiment with the GeoGebra application opened on the smart board as shown in Figure 3.

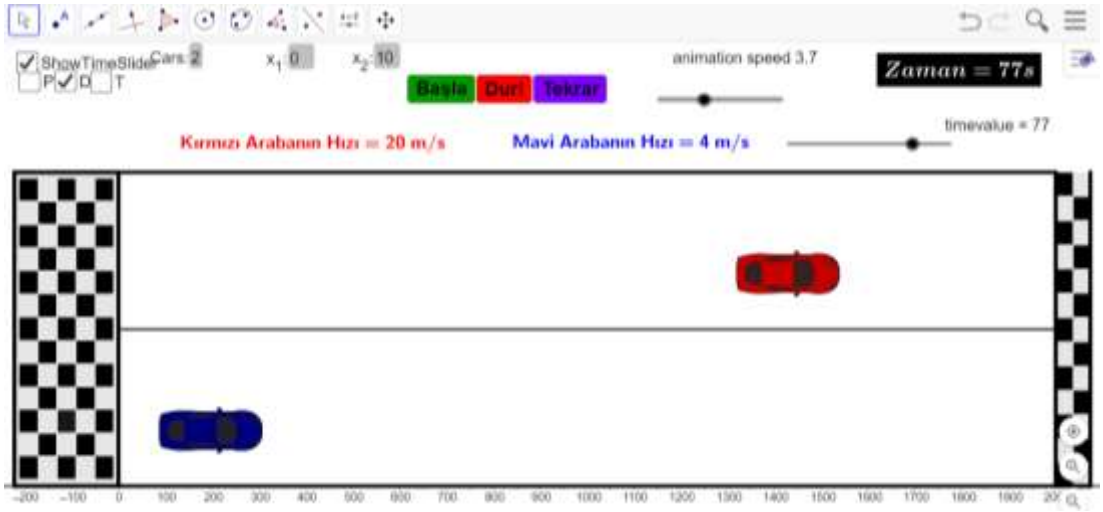


Figure 3. Photo showing the car racing experimentation about "Speed, Time, and Path" with GeoGebra

After two months of teaching process, all scales were re-applied as post-tests and the obtained data were analyzed. Each group that answered correctly got 10 points. The group with the most points as a result of five questions won the first place. Finally, the questions in the evaluation part of the lesson plan were discussed and solved by the whole class by applying the correct problem-solving steps.

Analysis of Data

The data collected from the scales applied to the experimental and control group students as pre-test and post-test were analyzed with IBM SPSS 22.0 program. Items 8, 9, 10, 11 and 12 that were negative in SFASTM were re-coded to be 1 = 5, 2 = 4, 4 = 2 and 5 = 1, and the scores obtained from this scale were collected and the lowest 17, highest 85 total attitude scores were calculated.

The 9th item, which was negative in MASMSS, was re-coded as 1 = 5, 2 = 4, 4 = 2 and 5 = 1, and the scores were summed to get the total anxiety score of each student as lowest 10 and highest 50 points. Likewise, the items 3, 6, 7, 10, 11 and 12, which were negative in the SEPSMSS used to measure students' mathematics self-efficacy, were re-coded to be 1 = 5, 2 = 4, 4 = 2 and 5 = 1. Each students' self-efficacy perception score for mathematics was calculated as 14 lowest and 70 highest.

Since there is no negative item in STEM-CIS, scores for mathematics, science, technology and engineering professions were calculated separately and STEM professions total score without the need for re-coding. The lowest score was 10 and the highest score was 50 for the four sub-domains, while the STEM occupations had a total score of 40 and a maximum of 200. According to the grade scoring key previously prepared in RPPAT, partial and full scores were calculated and the total success scores obtained to be the lowest 0 and the highest 100.

These scores of both experimental and control group students from pre-tests and post-tests were analyzed with descriptive statistics, independent sample t-test, dependent sample t-test and Pearson correlation. The significance level was 0.05 in all analyses.

Results

To see whether the data obtained from the pre-tests and post-tests showed normal distribution, Shapiro-Wilks test was used for groups with less than 50 students, and Kolmogorov-Smirnov test was used for groups with more than 50 students.

Table 3. Normality test results of the pre-test and post-tests by experimental and control groups

			Pre-Test				Post-Test			
		Df	Statistic	p	Skewness	Kurtosis	Statistic	p	Skewness	Kurtosis
Subfields of STEM-CIS	RPPAT	115	.138	.000	0.96	0.23	.071	.200	1.327	1.676
	Experimental	47	.847	.000	1.06	0.15	.958	.090	-.259	-.891
	Control	68	.127	.008	0.98	0.60	.093	.200	.460	-.513
	SFASTM	115	.077	.092	-0.78	0.60	.085	.042	-.779	.598
	Experimental	47	.975	.407	-0.12	-0.60	.964	.152	-.635	.783
	Control	68	.122	.013	-1.18	1.49	.103	.069	-.682	-.039
	MASMSS	115	.117	.001	0.94	0.38	.106	.003	.941	.382
	Experimental	47	.961	.113	0.56	-0.03	.946	.031	.493	-.702
	Control	68	.174	.000	1.36	1.56	.140	.002	.561	-.771
	SEPSMSS	115	.065	.200	0.50	0.21	.093	.016	-.504	.208
	Experimental	47	.982	.691	-0.40	0.70	.979	.555	.015	-.681
	Control	68	.097	.188	-0.53	-0.26	.132	.005	-.261	-.802
	STEM-CIS	115	.048	.200	-0.11	-0.23	.051	.200	-.11	-.225
	Experimental	47	.986	.842	-0.02	-0.05	.966	.192	-.623	1.289
	Control	68	.062	.200	-0.17	-0.24	.062	.200	-.105	-.451
	Mathematics	115	.099	.008	-.688	.540	.081	.064	-.688	.54
	Experimental	47	.966	.179	-.362	-.560	.951	.047	-.549	.057
	Control	68	.135	.004	-.915	1.393	.089	.200	-.567	-.077
	Science	115	.091	.021	-.575	-.198	.085	.039	-.575	-.198
	Experimental	47	.951	.048	-.631	-.020	.953	.059	-.575	-.004
	Control	68	.112	.034	-.449	-.705	.089	.200	-.628	.113
	Technology	115	.077	.087	-.580	.091	.108	.002	-.58	.091
	Experimental	47	.965	.167	-.441	-.284	.917	.003	-.931	.579
	Control	68	.076	.200	-.619	.175	.105	.062	-.713	.029
	Engineering	115	.094	.014	-.602	.175	.085	.041	-.602	.175
	Experimental	47	.965	.177	-.371	.051	.949	.038	-.210	-.723
	Control	68	.107	.052	-.684	.144	.121	.015	-.890	.616

Table 3 shows that the data from the pre-tests and posttests of all scales have a normal distribution when students are classified either in terms of significance, skewness, and kurtosis or in terms of both groups as experimental and control. In the Kolmogorov-Smirnov test, it is assumed that the data are normally distributed when $p > .05$. In addition, it is stated in some studies that skewness and kurtosis values are accepted as perfect in the range of ±1 for most psychometric purposes, but a range of ±2 is seen as an adequate criterion for normality in most cases (George & Mallery, 2010; Gravetter & Wallnau, 2014). Thus, to see whether between experimental and control group have significant mean differences on the scores of the scales, parametric tests can be applied.

To begin with, data obtained from the pre-test and post-test of RPPAT applied to both experimental and control groups to understand the effect of the problem-based STEM activities on the teaching process of the ratio-proportion and percentages to the experimental group students on the academic achievement. As a result of the pre-test, there was no significant difference between the mean scores of the experimental ($\overline{X} = 18.51$) and control ($\overline{X} = 20.51$) group students [$t(113) = -0.56$, $p = .58$]. However, looking at the data from the posttest of the RPPAT, we conclude that there is a significant difference between the mean scores of students in the experimental group ($\overline{X} = 69.00$) and the control group ($\overline{X} = 40.88$) [$t(113) = 6.82$, $p =$ .Considering the success levels of the experimental group students regarding the ratio-proportion and percentages after the implementation of the problem-based STEM activities by gender, there is not a significant difference in the means obtained by the female students ($\overline{X} = 63.55$) and male students ($\overline{X} = 73.80$) students [$t(45) = -1.83$, $p = .07$]. In other words, after implementing the lesson plans with the activities prepared within the scope of the research, after the RPPAT post-test, the male students in the experimental group have no advantage over female students in terms of achievement scores. Considering the success of the control group students in the ratio-proportion and percentages in this process, it is concluded that the average success rate of both female and male students is significantly higher than the pre-test. Specifically, there is no significant difference between genders in the pretest and posttest, and there is a significant increase in the mean score of all students in the control group compared to the pretest ($\overline{X} = 20.10$) and posttest ($\overline{X} = 40.88$) [$t(67) = -.41$, $p = .00$]. This emerging situation is considered to be an expected result of the traditional education environment compared to the results obtained by the experimental group students.

Secondly, observed that there was no significant difference between the students in the experimental ($\overline{X} = 64.87$) and control ($\overline{X} = 66.10$) group students in the attitude score towards mathematics obtained as a result of the

pretesting of SFASTM [t(113) = -0.53, p = .60]. Similarly, it is found that the difference between the mean scores of the experimental ($\overline{X} = 63.19$) and control ($\overline{X} = 63.79$) group students on attitude scores towards mathematics was not significant [t(113) = -0.22, p = .82]. In addition, there was no significant change in experimental group students' SFASTM pre-test and post-test scores according to both gender and all students. Similar results were seen where the total score mean for mathematics did not differ by gender, both pre-test and post-test separately. This showed that problem-based STEM activities, which lasted about two months, did not affect students' mathematics attitudes at the end of the application process.

Thirdly, to understand the effects of problem-based STEM activities on the students' math anxiety levels of students, the total anxiety mean scores of the experimental ($\overline{X} = 23.34$) and control ($\overline{X} = 19.35$) group students was analyzed by independent samples t-test and it is seen that this mean difference has significant in favor of the experimental group students [t (113) = 2.60, p = .01]. In other words, as a result of the pre-test, math anxiety levels of the experimental group students were significantly higher than the control group students. However, there was no statistically significant difference between the anxiety levels of the experimental ($\overline{X} = 23.60$) and control ($\overline{X} =$ 22,56) group students from post-test of MASMSS [t (113) = 0.58, p =. 56]. The anxiety level of the experimental group students, which was high as a result of the pre-test, decreased or did not increase significantly in a way that did not make any difference comparing with the control group students. This shows that STEM activities applied in the research effectively lower students' math anxiety or eliminate the factors that will increase the students' math anxiety. When the data of MASMSS were analyzed by gender, it is found that the difference between the mean scores of male students and female students in both experimental and control group was not significant. In addition, when examining the MASMSS pre-test and post-test scores, it is found that there was no statistically significant change in the overall anxiety scores of the students in the experimental group with respect to either gender and as a whole. However, anxiety of both male and female students towards mathematics significantly increased in the control group of pre-test and post-test data. It is seen that the anxiety mean scores of the students in the control group did not show any significant difference in terms of gender in the pre-test and post-test, but the anxiety mean scores for all of the control group students were higher in the post-test and this difference was significant.

Fourthly, to understand the impact of problem-based STEM activities on students' self-efficacy perceptions of mathematics, the data obtained as a result of the application of SEPSMSS as a pre-test and a post-test were analyzed. Considering the data obtained from the pre-test, the total mean score for the self-efficacy perception of the control group ($\overline{X}$ = 52.59) students was significantly higher than the experimental group students [t(113) = -2.10, p = .038]. Given the data from the posttest and parallel to the result of the pretest, the mean of the total score of the experimental group ($\overline{X} = 51.01$) for self-efficacy perception was higher than that of the students in the control group ($\overline{X} = 46.96$), but this time this difference was not significant [t(113) = -1.87, p = .064]. We can say that the scores for self-efficacy decreased in both groups, but the scores for self-efficacy perception of the students of the control group concerning mathematics decreased more than those of the students of the experimental group. In addition, the mean scores of female students in the experimental group are statistically significantly lower [t(21) = 2.70, p = .01] in the post-test ($\overline{X}$ = 44.14) compared to the pretest ($\overline{X}$ = 49,00). The mean scores of male students, on the other hand, was higher in the post-test ($\overline{X}$ = 49.44) than the pre-test mean ($\overline{X} = 48.44$) but this difference was not significant [t(24) = -0.46, p = .65]. This result showed that the problem-based STEM activities negatively affected the students' self-efficacy perceptions of mathematics and did not cause any change in male students. Also, there is no statistically significant difference in the pre-test ($\overline{X}$ = 48.70) and post-test ($\overline{X}$ = 46.96) self-efficacy mean scores of the students in the experimental group, both by gender and on the basis of all students [t(46) = -1.18; p = .24]. Considering the findings obtained from the results from the SEPSMSS of the control group students, the mean scores of the female students are in the pre-test ($\overline{X}$ = 53.00) and the post-test ($\overline{X}$ = 52.19) [t(42) = 0.70, p = .49] while the mean scores of the male students are in the pre-test ($\overline{X}$ = 51.88) and the post-test ($\overline{X}$ = 49.00) [t(24) = 1.20, p = .24]. These show that the pre-test and post-test mean differences of both genders was not significant (p > .05).

Fifthly, to understand the effects of problem-based STEM activities on the interests of students in professions in STEM fields, the data obtained as a result of the application of STEM-CIS to both experimental and control group students were analyzed. It was found that the total score of STEM-CIS from the pretest showed no significant difference between students in the experimental ($\overline{X} = 153.45$) and control ($\overline{X} = 154.82$) groups [t(113) = -0.35, p = .72].In parallel with this result, the interest levels of the experimental and control group students for the professions in mathematics, science, technology and engineering, which are subfields of the STEM, did not make a significant difference for each separately. This means that the interests of the experimental and control groups formed in the study for STEM occupations are at the same level, both overall and in comparison, to the sub-areas. In parallel with the pretest results, we saw that the total scores of STEM-CIS from the post-test did not create a significant difference between the experimental ($\overline{X}$ = 154.51) and control ($\overline{X}$ = 150.29) groups [t(113) = 0.90, p =

.37]. When we look at the scores related to the STEM subfields, it is concluded that the interest of the experimental and control group students in these fields does not make a significant mean difference compared to the post-test scores as in the pre-test results. Looking at the results of the analysis conducted to see how the students' interest in STEM professions changed depending on their gender in the pre-test and post-test, the analysis results show that the pre-test of the students in the experimental group by gender, based on the scores of the other sub-areas and the total score for the STEM areas, showed no significant mean difference as a result of the post-test. It is found that the post-test mean score ($\overline{X}$ = 44.72) regarding the interest of male students in the professions in technology was significantly higher than the pre-test score mean ($\overline{X}$ = 42.72) [t(24) = -2.21, p = .04]. Similarly, in the final test results of the STEM-CIS subtests show that only the technology scores of the male students ($\overline{X}$ = 44.72) are significantly higher than that of the female students ($\overline{X}$ = 37.86) [t(45) = -3.61, p = .00]. Moreover, the total interest mean score ($\overline{X}$ = 161.82) for the STEM professions of male students in the experimental group was somewhat higher than female students ($\overline{X}$ = 146.23) [t(45) = -2.21, p = .03]. When the scores of all female students and male students are compared, there is no significant difference between the total interest scores for the pre-test ($\overline{X}$ = 153.45) and post-test ($\overline{X}$ = 154.51) STEM professions [t(45) = -0.36; p = .72].

Lastly, when the mean scores of the control group students who continue their normal course process on the teaching ratio-proportion and percentages regarding STEM professions measured by STEM-CIS are examined, it was observed that only the mean score of female students decreased significantly in the post-test ($\overline{X}$ = 148.84) compared to the pre-test ($\overline{X}$ = 155.28) [t(42) = 2.39, p = .02]. Considering the interest in professions in STEM subfields, similarly, only the mean scores of female students in science and mathematics were statistically significant in the post-test compared to the pre-test. Furthermore, the findings regarding how the interest of the experimental group students in the sub-fields changed according to gender based on pre-test and post-test showed that the mean scores of female students in mathematics, science and engineering sub-fields were higher only in the pre-test compared to male students. When - look at the control group in general, the scores related to the professions in mathematics and science only decreased significantly in the post-test compared to the pre-test. The mean interest score of the control group with STEM-CIS also did not differ significantly with respect to gender in the pretest and posttest, but the mean score of the posttest ($\overline{X}$ = 150.29) based on all students was significantly lower than the mean score of the pretest ($\overline{X}$ = 154.82) [t(67) = -9.41; p = .00].

Discussion and Conclusion

Proportional reasoning is defined as the heart of middle school mathematics and includes mathematical relationships in multiplicative state in nature (Ben-Chaim, Fey, Fitzgerald, Benedetto, & Miller, 1998). The ratio-proportion subject is crucial for school mathematics because of its connection with daily life and forming the basis of many subjects (Duatepe, Akkuş-Çıkla & Kayhan, 2005). So, we have chosen the topic of proportionality both because of its importance in mathematics education and because of its connection to daily life. According to NCTM (1989), the ability to reasoning in students develops proportionally from the fifth grade to the eighth grade, and the time and effort required to ensure the development of this ability are extremely important, and no matter how long it takes, students need to work to acquire this skill. The teaching process carried out by integrating STEM into science education contributed positively to students' academic achievements, scientific process skills, and engineering knowledge (Akdağ, 2017).

Similarly, the experimental group students of this study are more successful than the control group students in terms of ratio-proportion and percentages afterward the problem-based STEM activities. Moreover, according to the post-test results, both male students' and female students' scores increased more and statistically significant compared to the control group students. Factors affecting students' performance in mathematics consist of attitudes towards mathematics and the importance of developing these attitudes to improve students' achievements in mathematics (Mohamed & Waheed, 2011). McDonald (2016) states that involving students in fun, hands-on, and daily life-related activities will improve their attitudes toward STEM disciplines. STEM activities prepared in this framework are intended to provide students with a fun learning environment and to connect their subjects with daily life. Considering the definitions about attitude towards mathematics in the literature, the change of this affective feature in the individual depends on many factors such as family, teacher, social environment, age, intelligence, time etc. (Elçi, 2008; Kurbanoğlu, & Takunyacı, 2012; Yamak, Bulut & Dündar, 2014; Hacıömeroğlu, 2017; Aydın, Saka & Guzey, 2017). It is an expected result that the problem-based STEM activities, which last about two months, on the ratio-proportions and percentages do not cause any change in the students' attitudes towards the mathematics lesson. If these activities were kept longer and not limited to a specific subject or unit, one of the appropriate environments would allow students to develop a positive attitude towards the mathematics lesson.

Next, there are many studies on how math anxiety changes according to some variables such as gender, grade level, social environment, mathematics achievement (Dreger & Aiken, 1957; Aiken, 1974; Haladyna, Shaughnessy & Shaughnessy, 1983; Wigfield & Meece, 1988; Hembree, 1990; Randolph, 1998; Luo, Wang & Luo, 2009). When - looked at these studies, it is a common result that anxiety towards mathematics is among the factors that negatively affect mathematics achievement. In studies that investigate math anxiety by gender, it is observed that both students' math anxiety is higher than female students' and female students' math anxiety levels are higher than that of male students. Also, students' anxieties about mathematics are related to the students' expectations scores (Karjanto & Yong, 2013). This supports the view of Aiken (1974) in elementary and middle school years that male students had some more positive feelings about mathematics than female students, but there was no definite conclusion about whether there were gender differences in math anxiety among young students. As a result of the pre-test performed before the application, the mathematics anxiety of the experimental group students was significantly higher than the students in the control group. However, as a result of the post-test after the activities, this high level of anxiety has reached a level that is not statistically significant. This showed that problem-based STEM activities have an undeniable effect on reducing students' anxiety about mathematics.

Next, self-efficacy perception of mathematics is expressed as a situational or problem-specific assessment of an individual's confidence in the ability to perform a particular mathematical task or to successfully achieve a problem (Hackett & Betz, 1989). Bandura (1977) argues that a person's self-efficacy perception is an important factor that determines his belief in his ability to successfully perform a particular task or behavior in the face of obstacles faced by him, whether he will attempt to do a particular task, and how much effort he will make. At the same time, in terms of social learning theory, it is suggested that self-efficacy expectation is an important factor affecting mathematics education and career choices as well as attitude towards mathematics and mathematics performance and achievement (Bandura, 1977; 1986). In the study of Işıksal and Aşkar (2003), which included 7^{th} and 8^{th} grade students to investigate the relationship between perception of mathematics self-efficacy and computer self-efficacy, it was revealed that students' perceptions of mathematics self-efficacy did not change by their gender. Similarly, in Ayotola and Adedeji's (2009) study examining the relationship between middle school students' mathematics self-efficacy and their mathematics achievement, it was found that there was no significant difference between students' gender and their perception of mathematics self-efficacy. This is consistent with the results of the study among students in the overall control group and male students in the experimental group. In Pajares and Miller's (1994) study, which was designed to investigate the relationship between mathematics self-efficacy perceptions and mathematics achievement of high school students, it was found that students with high mathematics self-efficacy perceptions had higher mathematics achievement, and these perceptions were higher for male students than for female students. Similar to this result, Lent, Lopez and Bieschke (1991) concluded that male students at high school and university levels have higher self-confidence and self-efficacy perceptions in mathematics, science and technology than female students. The similarity with the results of Lent, Lopez and Bieschke (1991) because there were practices involving science, technology, engineering and mathematics in the activities, the self-efficacy perception scores of female students in the experimental group of the research were significantly lower in the post-test compared to the pre-test. These findings are similar with Pajares and Miller's (1994) study. Kalın (2010) stated that self-efficacy perceptions, which differ between studies, may be due to the qualifications of the researchers. In the context of the research, they tried to select subjects that might be of interest to both genders during the preparation of problem-based STEM activities, but it was clearly observed during the classroom practice those male students were more interested in these activities. Therefore, it can be said that the characteristics of the activities implemented cause this difference of female students. In addition, although the pre-test scores were significantly higher in favor of the control group students, the absence of this significance in the post-test results could mean that the STEM activities affected the students' perceptions of mathematics in the experimental group compared with the control group because there is a lot of research in the literature about a strong relationship between mathematics self-efficacy perception and mathematics achievement (Lent, Lopez and Bieschke, 1991; Bandura, 1995; Ayotola & Adedeji, 2009; Öztürk & Şahin, 2015; Keşan & Kaya, 2018). In other words, these activities have a positive effect on preventing students from deteriorating their perceptions, even though they do not directly increase students' self-efficacy perceptions in mathematics, since the mathematics performance of students in the experimental group is significantly higher than that of students in the control group, both proportionally and as a percentage. Fifthly, the fact that a philosophy that is in search of innovation is the basis of STEM education increases the importance of this education for economies day by day. In a rapidly changing, developing and the digitalizing world, a labor market that has the necessary training can meet the needs of the era and renew itself constantly is required for companies to take their place in economic competition (Vilorio, 2014; TÜSİAD, 2014). This situation causes an increase in the need for individuals who are trained in STEM fields, sectors of companies that want to have a voice in the global economy (TÜSİAD, 2017). According to TÜSİAD (2017), to lead the global economy where innovation and digitalization will give direction, studies and investments should be made to create employees with STEM skills and individuals should be educated in this way, starting from preschool. Students' interests and attitudes towards science, technology, engineering and

mathematics develop negatively, especially in middle school years (Degenhart, Wingenbach, Dooley, Lindner, Mowen, & Johnson, 2007). To eliminate this situation and increase the interest of students in these areas, which are very important for today and the future, studies should be done especially in school education programs and the effectiveness of these studies should be investigated. As a result, it is observed that the interest scores of STEM professions of the experimental group students increased slightly in the post-test compared to the pre-test, while the scores of the control group students decreased in comparison to the pre-test. These differences were not significant for the experimental and control groups, but when the mean scores of these groups were examined separately, the interest of the control group students in STEM professions decreased significantly. In that case, the problem-based STEM activities contribute directly to the experimental group students in the professions in the STEM fields, but when the interest of the control group students decreases, they are positively contributed. Incorporating the skills of these occupations into the activities and providing information about them to students during the instructional phase is believed to be effective in this situation. In the study conducted by Wyss, Heulskamp, and Siebert (2012), they found that career choice occupies an important place in the middle school years. In this study, they examined the effect of providing accurate and detailed information about STEM careers during middle school. So, they expressed that video interviews with professionals in STEM fields have increased the students' interest in these professions and their desire to choose them in the future without any gender difference. This result supports the conclusion that obtaining information about the professions of the research increases the interest in STEM professions. As a result of the research in which the STEM education in the problem-based learning environment of Alıcı (2018) investigated the attitude of 5th grade students towards STEM disciplines, their perceptions of STEM career and their interest in STEM professions, they find that these characteristics of the students increased significantly. Finally, Hossain and Robinson (2012) stated that to be successful in STEM careers, it is necessary to be curious, think logically and creatively in problem-solving, have effective communication skills and work in teams. In this research, it is seen that the activities developed for the teaching process of the ratio-proportion and percentages contributed to the students acquiring and use these skills.

Finally, in the study to learn the opinions of students belonging to Şahin, Ayar and Adıgüzel (2014) about the activities they carried out about post-school STEM areas, they conducted these activities without any concern felt comfortable and enjoyed. Furthermore, students stated that these activities are very different from the normal lesson process, they make fun experiments and researches on mathematics and science, and finally they see the positive effects of learning with their friends. Not only are students learning 21st century skills such as teamwork and effective communication in these activities, but interest in STEM careers has also increased. In the study of Mohr - Schroeder, Jackson, Miller, Walcott, Little, Speler and Schroeder (2014), the mixed method was used as a post-test and STEM summer camps in which middle school students attend to increase their interest in various STEM fields and STEM professions. The effect of camps on students was investigated. The results indicated that students learned the subjects better because the camp and activities are very fun and they interact with the materials they have never seen before. According to the students, the fact that the activities addressed their interests provided both easier understanding and permanent learning. In addition, students' interest in STEM fields has increased and they want to do more activities in these fields. In the study defining STEM -integrated project-based learning by Afriana, Permanasari, and Fitriani (2016) and aimed at improving the science literacy of middle school students, they found that the development of science literacy of students in the experimental group after STEM -integrated project-based learning was more significant than that of students in the control group. In addition, student responses to the study showed that almost all students were excited about project-based STEM learning, had impressive experiences during learning and increased their learning motivations and interests.

In mathematics course, where many students from primary school to university have difficulties, different teaching methods accepted globally should be tried. In many studies STEM education has an important role in reducing students' fears of mathematics, contributing to self-efficacy perceptions and increasing mathematics achievement. STEM education will become an important part of mathematics education in addressing different intelligence types of students and bringing together different disciplines.

Recommendations and Further Researches

With the widespread use of internet and social media networks, people can access information and experience anywhere in the world, which is expressed as globalization (Eser, 2014). With digitalization, which is a result of globalization, major changes have occurred in social, political, economic and cultural life. To keep up with these changes and have a say in the economic fields, countries need to have an education system suitable for the needs of the age. Involving students in STEM activities as in-school or out-of-school activities will assist students in gaining 21st century skills that are needed by the current century. First of all, prospective teachers should be trained in understanding STEM education and preparing a suitable lesson plan. In-service training for STEM education

should be provided not only to prospective teachers, but also to existing teachers, but these training should be arranged so as not to be theoretical but practical. In addition, updating the mathematics curriculum accordingly, rearranging the textbooks to include more mathematical tasks that require students to think more and require interdisciplinary knowledge transfer, as well as effective communication skills, analytical and critical thinking, commenting, etc. are thought to be effective in gaining century skills. The impact of parents and social environment on students' preference for STEM fields in the choice of profession that will affect their future is very important. Parents should encourage students to research and participate in STEM camps and clubs that match their interests, not solve many questions, and contribute to their academic success in math and science and their interest in STEM fields and careers. This study examined the impact of STEM instruction for middle school students on variables related to mathematics instruction. Conducting a similar study at primary and high school levels will allow for more comprehensive results and comparison of the results of this study. Also, this research was carried out with students who did not know anything about STEM. Hence, conducting the research in an environment where students were exposed to STEM education for a longer period would probably produce different results. In addition, examining the effectiveness of the programs integrated into STEM, which takes mathematics courses and other disciplines as the center, can offer results to be taken into consideration in the training programs to raise individuals ready for Industry 4.0 and beyond.

Acknowledgements or Notes

This study was produced from Yavuz Macun's master's thesis and was funded by the Erciyes University Scientific Research Projects Unit with the project code SYL-2019-8749.

Author (s) Contribution Rate

The authors contributed equally to the article.

Conflicts of Interest

Authors declare that they have no conflict of interest.

Ethical Approval

Ethical permission 26.02.2019-18 was obtained from Erciyes University Social and Human Sciences Ethics Committee for this research.

References

Afriana, J., Permanasari, A. & Fitriani, A. (2016). Project Based Learning Integrated to Stem to Enhance Elementary School's Students Scientific Literacy. *Jurnal Pendidikan IPA Indonesia*, *5*(2), 261-267.

Aiken, L.R. (1974). Two scales of attitude toward mathematics. *Journal for Research in Mathematics Education, 5*(2), 67-71.

Akdağ, F. T. (2017). *STEM Uygulamalarının Öğrencilerin Akademik Başarı, Bilimsel Süreç ve Yaşam Becerileri Üzerine Etkisi [Effect of STEM applications on academic achievement, scientific process and life skills]*. Unpublished Doctoral Dissertation, Samsun: Ondokuz Mayıs University.

Alıcı, M. (2018). *Probleme dayalı öğrenme ortamında STEM eğitiminin tutum, kariyer algı ve meslek ilgisine etkisi ve öğrenci görüşleri [Effect of STEM applications on academic achievement, scientific process and life skills]*. Unpublished Master Thesis, Kırıkkale: Kırıkkale University.

Aydagül, B. & Terzioğlu, T. (2014). Bilim, teknoloji, mühendislik ve matematiğin önemi. [Importance of science, technology, engineering and mathematics]. *TÜSİAD Görüş Dergisi, 85*, 13-19.

Aydın, G., Saka, M. & Guzey, S. (2017). 4-8. sınıf öğrencilerinin fen, teknoloji, mühendislik, matematik (STEM=FETEMM) tutumlarının incelenmesi [Science, Technology, Engineering, Mathematic (STEM) Attitude Levels in Grades 4th - 8th]. *Mersin Üniversitesi Eğitim Fakültesi Dergisi, 13*(2), 787-802.

Ayotola, A. & Adedeji, T. (2009). The relationship between mathematics self-efficacy and achievement in mathematics. *Procedia-Social and Behavioral Sciences, 1*(1), 953-957.

Balbağ. M. Z. & Yenilmez. K. (2016). Fen bilgisi ve ilköğretim matematik öğretmeni adaylarının STEM'e yönelik tutumları [The STEM attitudes of prospective science and middle school mathematics teachers]. *Eğitim ve Öğretim Araştırmaları Dergisi. 5*(4), 301-307.

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review, 84*, 191-21.

Bandura, A. (1986). The explanatory and predictive scope of self-efficacy theory. *Journal of Social and Clinical Psychology, 4*(3), 359-373.

Bandura, A. (Ed.). (1995). *Self-efficacy in changing societie*s. Cambridge University Press.

Ben-Chaim, D., Fey, J. T., Fitzgerald, W. M., Benedetto, C. & Miller, J. (1998). Proportional reasoning among 7th grade students with different curricular experiences. *Educational Studies in Mathematics, 36*(3), 247-273.

Benešová, A. & Tupa, J. (2017). Requirements for Education and Qualification of People in Industry 4.0. *Procedia Manufacturing 11*. 2195 – 2202.

Bindak, R. (2005). İlköğretim Öğrencileri İçin Matematik Kaygı Ölçeği. *F. Ü. Fen ve Mühendislik Bilimleri Dergisi, 17*(2), 442-448.

Büyüköztürk, Ş., Çakmak, E., Akgün, Ö., Karadeniz, Ş. ve Demirel, F. (2013). *Bilimsel Araştırma Yöntemleri [Scientific Research Methods]*. Ankara: Pegem Akademi Yayınları.

Bybee, R. W. (2010). *The teaching of science: 21st century perspectives.* NSTA press.

Çorlu, M. S., Capraro, R. M. & Capraro, M. M. (2014). Introducing STEM education: Implications for educating our teachers for the age of innovation. *Eğitim ve Bilim, 39*(171).

Çorlu, M. S. & Çallı, E. (2017). *STEM Kuram ve Uygulamalarıyla Fen, Teknoloji, Mühendislik ve Matematik Eğitimi, Öğretmenler İçin Temel Kılavuz [Science, Technology, Engineering and Mathematics Education with STEM Theories and Practices, Basic Guide for Teachers]*. İstanbul: Pusula Yayıncılık.

Degenhart, S. H., Wingenbach, G. J., Dooley, K. E., Lindner, J. R., Mowen, D. L. & Johnson, L. (2007). Middle school students' attitudes toward pursuing careers in science, technology, engineering, and math. *NACTA Journal*, 52-59.

Delen. İ. & Uzun. S. (2018). Matematik öğretmen adaylarının FeTeMM temelli tasarladıkları öğrenme ortamlarının değerlendirilmesi [Evaluating STEM Based Learning Environments Created by Mathematics Pre-Service Teachers]. *Hacettepe Üniversitesi Eğitim Fakültesi Dergisi, 33*(3), 617-630.

Doğanay, K. (2018). *Probleme Dayalı STEM Etkinlikleriyle Gerçekleştirilen Bilim Fuarlarının Ortaokul Öğrencilerinin Fen Bilimleri Dersi Akademik Başarılarına ve Fen Tutumlarına Etkisi [The effect of science festivals upon with problem-based STEM activities on the student's science attitudes and academic achievements]*. Unpublished Master Thesis, Kastamonu: Kastamonu University.

Dreger, R. M. & Aiken, L. R. (1957). The identification of number anxiety in a college population. *Journal of Educational Psychology, 48*, 344-351.

Duatepe, A., Akkuş-Çıkla, O. & Kayhan, M. (2005). Orantısal akıl yürütme gerektiren sorularda öğrencilerin kullandıkları çözüm stratejilerinin soru türlerine göre değişiminin incelenmesi [An investigation on students' solution strategies for different proportional reasoning items]. *Hacettepe Üniversitesi Eğitim Fakültesi Dergisi, 28*(1), 73- 81.

Elçi, A. N. (2008). *Öğrenme stillerine uygun olarak seçilen öğrenme yöntemlerinin öğrencinin başarısına, matematiğe yönelik tutumuna ve kaygısına etkileri [The effects of learning methods chosen in accordance to the learning styles on the achievements of the student,on his attitudes and his anxiety towards mathematics]*. Unpublished Doctoral Dissertation, İzmir: Dokuz Eylül University.

Eser, E. (2014). Küreselleşme süreci ve eğitime etkisi [Globalization Process and Its Effects on Education]. *Anemon Muş Alparslan Üniversitesi Sosyal Bilimler Dergisi, 2*(2), 211-224.

Fraenkel, J., R., & Wallen, N., E. (2010). *How to design and evaluate research in education.* (7th ed.). McGraw-Hill, New York: NY.

George, D. & Mallery, M. (2010). *SPSS for Windows Step by Step: A Simple Guide and Reference*, 17.0 update (10a ed.) Boston: Pearson.

Gökbayrak, S. & Karışan, D. (2017b). Altıncı Sınıf Öğrencilerinin FeTeMM Temelli Etkinlikler Hakkındaki Görüşlerinin İncelenmesi [Exploration of Sixth Grade Students' Views on STEMM Based Activities]. *Alan Eğitimi Araştırmaları Dergisi (ALEG) 3*(1), 25-40.

Gravetter, F. & Wallnau, L. (2014). *Essentials of Statistics for the Behavioral Sciences* (8thed.). Belmont, CA: Wadsworth.

Hacıömeroğlu, G. (2017). Matematiğe yönelik tutum ölçeği kısa formunun geçerlik ve güvenirlik çalışması [Reliability and Validity Study of the Attitude towards Mathematics Instruments Short Form]. *Journal of Computer and Education Research, 5*(9), 84-99.

Hackett, G. & Betz, N. E. (1989). An exploration of the mathematics self-efficacy/mathematics performance correspondence. *Journal for research in Mathematics Education*, 261-273.

Haladyna, T., Shaughnessy, J. & Shaughnessy, J. M. (1983). A causal analysis of attitude toward mathematics. *Journal for Research in mathematics Education*, 19-29.

Hefty, L. J. (2015). STEM Gives Meaning to Mathematics. *Teaching Children Mathematics, 21*(7), 422-429.

Hembree, R. (1990). The nature, effects, relief of mathematics anxiety. *Journal for Research in Mathematics Education, 1*, 33–46.

Hossain, M. & Robinson, M. (2012). How to motivate US students to pursue STEM careers. *US-China Education Review A, 2*, 442–451.

IEA. (2015). *TIMSS 2015 International Results in Mathematics*. Retrieved August 20, 2018 from http://timss2015.org/timss-2015/mathematics/student-achievement/

Işıksal, M. & Aşkar, P. (2003). İlköğretim Öğrencileri İçin Matematik ve Bilgisayar Öz-Yeterlik Algısı Ölçekleri [The Scales of Perceived Mathematics and Computer Self-Efficacy for Elementary Students]. *Hacettepe Üniversitesi Eğitim Fakültesi Dergisi, 25*, 109-118.

James, J. S. (2014). *Science, technology, engineering, and mathematics (STEM) curriculum and seventh grade mathematics and science achievement.* Retrieved October 11, 2018 from https://search.proquest.com/docview/1520011923?accountid=13014

Kalın, G. (2010). *İlköğretim Öğrencilerinin Matematik Tutumları, Öz yeterlikleri, Kaygıları ve Dersteki Başarılarının İncelenmesi* [The examination of Elementary Studets' Mathematics Attitudes, Self Efficiancy, Anxiety and Achievement]. Unpublished Master Thesis, Ankara: Başkent University.

Karjanto, N. & Yong, S. T. (2013). Test anxiety in mathematics among early undergraduate students in a British university in Malaysia. *European Journal of Engineering Education, 38*(1), 11-37.

Kennedy, T. J. & Odell, M. R. L. (2014). Engaging Students in STEM Education. *Science Education International*, *25*(3), 246-258.

Keşan, C. & Kaya, D. (2018). Mathematics and Science Self-Efficacy Resources as the Predictor of Academic Success. *International Online Journal of Educational Sciences, 10*(2), 45-58

Kier, M. W., Blanchard, M. R., Osborne, J. W. & Albert, J. L. (2014). The development of the STEM career interest survey (STEM-CIS). *Research in Science Education, 44*(3), 461-481.

Koyunlu Ünlü, Z., Dökme, İ. ve Ünlü, V. (2016). Adaptation of the science, technology, engineering, and mathematics career interest survey (STEM-CIS) into Turkish. *Eurasian Journal of Educational Research, 63*, 21-36.

Kurbanoğlu, N. İ. & Takunyacı, M. (2012). Lise öğrencilerinin matematik dersine yönelik kaygı, tutum ve özyeterlik inançları bazı değişkenlere göre incelenmesi [An investigation of the attitudes, anxieties and self-efficacy beliefs towards mathematics lessons high school students in terms of gender, types of school, and students' grades]. *Uluslararası İnsan Bilimleri Dergisi, 9*(1), 110-130.

Lent, R.W., Lopez, F.G. & Bieschke, K.J. (1991). Mathematics self-efficacy: sources and relation to science-based career choice. *Journal of Counselling Psychology, 38*, 424-430.

Lim, S. Y. & Chapman, O. (2013). Development of a short form of the attitudes toward mathematics inventory. *Educational Studies in Mathematics, 82*, 145-164.

Luo, X., Wang, F. & Luo, Z. (2009). Investigation and analysis of mathematics anxiety in middle school students. *Journal of mathematics Education*, *2*(2), 12-19.

McBride, J. & Silverman, F.L. (1991). Integrating elementary/middle school science and mathematics. *School Science and Mathematics, 91*, 285-292.

McClain, M. L. (2015). *The effect of STEM education on mathematics achievement of fourth-grade underrepresented minority students.* Retrieved November 11, 2018 from https://search.proquest.com/docview/1728919094?accountid=13014

McDonald, C. V. (2016). STEM Education: A review of the contribution of the disciplines of STEM. *Science Education International, 27*(4), 530-569.

Mohamed, L. & Waheed, H. (2011). Secondary students' attitude towards mathematics in a selected school of Maldives. *International Journal of Humanities and Social Science, 1*(15), 277-281.

Mohr-Schroeder, M. J., Jackson, C., Miller, M., Walcott, B., Little, D. L., Speler, L. & Schroeder, D. C. (2014). Developing Middle School Students' Interests in STEM via Summer Learning Experiences: See Blue STEM Camp. *School Science and Mathematics, 114*(6), 291-301.

MoNE. (2016). STEM Education Report. Retrieved from http://yegitek.meb.gov.tr/STEM_Egitimi_Raporu.pdf on July 26, 2018

MoNE. (2017). STEM Education Teacher's Handbook. Retrieved from http://scientix.meb.gov.tr/images/upload/Event_35/Gallery/STEM%20E%C4%9Fitimi%20%C3%96%C4%9Fretmen%20El%20Kitab%C4%B1.pdf on July 26, 2018

MoNE. (2018b). Mathematics Curriculum. Ankara.

Morgan, G. A., Leech, N. L., Gloeckner, G. W., & Barrett, K. C. (2004). *SPSS for introductory statistics: Use and interpretation*. Psychology Press.

National Council of Teachers of Mathematics (NCTM). (1989). *Curriculum and Evaluation Standards for School Mathematics*. Reston, VA.: The Council.

Obama, B. (2009, November 23). *Remarks by the president on the "Education to Innovate" Campaign.* Retrieved July 22, 2018 from https://obamawhitehouse.archives.gov/photos-and-video/video/president-obama-kicks-educate-innovate#transcript

Öztürk, Y. A. & Şahin, Ç. (2015). Matematiğe ilişkin akademik başarı-özyeterlilik ve tutum arasındaki ilişkilerin belirlenmesi [Determining the Relationships between Academic Achievement, Self-Efficacy and Attitudes Towards Maths]. *International Journal of Social Science, 31*, 343-366.

Pajares, F. & Miller, M. D. (1994). Role of self-efficacy and self-concept beliefs in mathematical problem solving: A path analysis. Journal of Educational Psychology, 86(2), 193.

Ramaley, J. A. (2007). *Facilitating change: Experience with the reform of STEM Education.* Retrieved January 19, 2019 from http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.526.8592&rep=rep1&type=pdf

Randolph, T. (1998). *An assessment of mathematics anxiety in students from grades four through eight*. Cambridge, MA: Cambridge Information Group.

Rogers, C. & Portsmore, M. (2004). Bringing engineering to elementary school. *Journal of STEM Education: Innovations & Research, 5.*

Sanders, M. (2009) STEM, STEM education, STEMmania. *The Technology Teacher, 68(*4), 20-26.

Şahin, A., Ayar, M. C. & Adıgüzel, T. (2014). STEM Related After-School Program Activities and Associated Outcomes on Student Learning. Educational Sciences: *Theory and Practice, 14*(1), 309-322.

Tapia, M. & Marsh, G. E., II. (2004). An instrument to measure mathematics attitudes. *Academic Exchange Quarterly, 8*(2), 16-21.

TÜSİAD. (2014). *STEM alanında eğitim almış işgücüne yönelik talep ve beklentiler araştırması* [Demand and expectations research for the workforce trained in STEM]. Retrieved March 2, 2019 from https://tusiad.org/tr/yayinlar/raporlar/item/ download/7014_d28ffa2adda423c6d3852cc01c965993

TÜSİAD. (2017). *2023'e Doğru Türkiye'de STEM Gereksinimi* [STEM requirements towards 2023 in Turkey]. Retrieved March 2, 2019 from https://www.tusiadstem.org/images/raporlar/2017/STEM-Raporu-V7.pdf

Umay, A (2001). İlköğretim Matematik Öğretmenliği Programının Matematiğe Karşı Özyeterlik Algısına Etkisi [The Effect of The Primary School Mathematics Teaching Program on the Mathematics Self-Efficacy of Students]. *Journal of Qafqaz University*, 8 Fall, Bakü, Azerbaycan.

Vilorio, D. (2014). STEM 101: Intro to tomorrow's jobs. *Occupational Outlook Quarterly, 58*(1), 2-12.

Wigfield, A. & Meece, J. L. (1988). Math anxiety in elementary and secondary school students. *Journal of educational Psychology, 80*(2), 210.

Windschitl, M. (2009). *Cultivating 21st Century Skills in Science Learners: How Systems of Teacher Preparation and Professional Development Will Have to Evolve.* Paper commissioned by National Academy of Science's Committee on The Development of 21st Century Skills. Washington, DC.

Wyss, V. L., Heulskamp, D. & Siebert, C. J. (2012). Increasing middle school student interest in STEM careers with videos of scientists. *International journal of environmental and science education, 7*(4), 501-522.

Yamak, H., Bulut, N. & Dündar, S. (2014). 5. sınıf öğrencilerinin bilimsel süreç becerileri ile Fen'e karşı tutumlarına FeTeMM etkinliklerinin etkisi [The Impact of STEM Activities on 5th Grade Students' Scientific Process Skills and Their Attitudes Towards Science]. *Gazi Üniversitesi Eğitim Fakültesi Dergisi, 34*(2), 249-265.

Yıldırım, B. (2013). *Amerika, AB Ülkeleri ve Türkiye'de STEM Eğitimi [STEM Education in US, EU Countries and Turkey.]*. 22. Ulusal Eğitim Bilimleri Kongresi. Eskişehir: Osmangazi Üniversitesi.

Yıldız, A. (2018). Endüstri 4.0 ve Akıllı Fabrikalar [Industry 4.0 and Smart Factories]. *Sakarya Üniversitesi Fen Bilimleri Enstitüsü Dergisi, 22*(2), 546-556.

Article History
Received: 24.09.2021
Received in revised form: 28.01.2022
Accepted: 01.02.2022
Article Type: Research Article

International Journal of Contemporary Educational Research (IJCER)

www.ijcer.net

The Role of Cognitive Distortions related Academic Achievement in Predicting the Depression, Stress and Anxiety Levels of Adolescents

Ahmet BUĞA[1], İdris KAYA[2]
[1] Gaziantep University, 0000-0002-9598-2451
[2] Gaziantep University, 0000-0001-9562-3347

To cite this article:

Buğa, A., & Kaya, İ.(2022). The Role of Cognitive Distortions related Academic Achievement in Predicting the Depression, Stress and Anxiety Levels of Adolescents. *International Journal of Contemporary Educational Research*, *9*(1), 103-114. https://doi.org/10.33200/ijcer.1000210

International Journal of Contemporary Educational Research

Volume 9, Number 1, March 2022, 103-114 ISSN: 2148-3868

The Role of Cognitive Distortions related Academic Achievement in Predicting the Depression, Stress and Anxiety Levels of Adolescents

Ahmet Buğa[1*], İdris Kaya [1]
[1]Gaziantep University

Abstract

The purpose of this study is to assess the predictive power of the cognitive distortions related to academic success concerning the depression, stress and anxiety levels of adolescents. The sample of research consists of 411 people; 192 (46,7 %) were female, 219 (53,3 %) were male, with 203 (49,4%) of the group continuing their education at academic high school whereas 208 (50,6 %) were vocational high school students. The study data was obtained by using the Personal Information Form, Depression, Anxiety and Stress Scale (DASS-42) – High School Form and Cognitive Distortions Scale related to Academic Achievement (CDS-AA). The t-test, ANOVA and simple linear regression analysis were used in analyzing the data. It was observed that cognitive distortions related to academic success, one of the research variables, did not differ according to gender, class level and receiving out-of-school academic support. On the other hand, it was seen that depression, anxiety and stress scores differed significantly in terms of gender, class level and receiving out-of-school academic support. Finally, it was observed that cognitive distortions related to academic achievement are a statistically significant predictor of depression, anxiety and stress.

Keywords: Adolescence, Cognitive Distortions Related to Academic Achievement, Depression, Anxiety, Stress

Introduction

Adolescence is a critical stage of development. Many changes occur in many ways, whether physically, emotionally, behaviorally, or intellectually, and when the adolescent tries to adapt to these changes. In this period, which is decisive for mental health, sometimes academic success expectations may come to the fore, and these demands may be far from functionality. Especially cognitive errors such as overestimating success, equation success with self-worth, and a low tolerance for failure may be related to adolescents' mental health. At this point, it can be said that the processes of the adolescent's interpretation are more important than the changes in the external world, such as increased exams and success expectations from the environment.

Adolescence is a period full of problems due to many different reasons such as the increase of sexual stimulation, fast growth, identity conflict and the ongoing dependence on the family (Çivilidağ, 2013). In addition, adolescents also need to cope with complex duties such as identity development, social development, academic success, preparing for their future profession or planning their future. The fact that the adolescence period also covers the university exam preparation period in Turkey makes this period extra critical, and the desire for academic success may come to the forefront (Çetin & Ceyhan, 2018). In fact, Andiç (2013) conducted a study on the issues that preoccupy adolescents and concluded that they are mainly concerned about issues such as their physical appearance, their relationships with family, peers or the opposite sex, as well as their future, education, exams and career opportunities. Accordingly, it can be said that adolescents focus mainly on academic issue.

Eskin, Ertekin, Harlak and Dereboy (2008) carried out a study with high school students as a result of which it was concluded that 18 % might be diagnosed with depression and that there is a statistically significant relationship between the academic success scores of adolescents and their depression levels. Serin and Topses (2017) have revealed as a result of their study that the psychological general symptoms index of students with low academic success was higher compared with students who have higher academic success. Other studies have reported that

* Corresponding Author: *Ahmet buğa, buga@gantep.edu.tr*

students who consider their school success as "bad" have higher mean depression scores (Anlayışlı & Serin, 2019; Türkleş, Hacıhasanoğlu & Çapar, 2008).

It is observed in the literature that cognitive distortions are related to academic success and the psychological characteristics of the individual (Savi-Cakar, 2014; Usen et al., 2016). It has been revealed that children under depression display more cognitive errors and make more negative references (Tems et al., 1993). Suadiye and Aydın (2009) have reported that children and adolescents diagnosed with anxiety have higher levels of catastrophizing and overgeneralization. Kapali et al. (2019) conducted a study in which they revealed that almost half of adolescents experience moderate academic stress and a quarter experience high academic stress, and that there is a statistically significant correlation between academic stress and academic achievement. It has been reported in another study carried out with adolescents that there is a negative and statistically significant relationship between depression and academic success (Khesht-Masjedi et al., 2019). It has been concluded in a study compiling the studies examining the relations between stress and academic success in Chinese children for the past 20 years that the majority of these studies have concluded a negative correlation between academic stress and academic success (Ye et al., 2019). Balkis, Duru and Bulus (2013) have found that rational academic beliefs directly impact academic procrastination and the time preferences for studying for exams and that they have an indirect impact on academic success. Whereas Atkinson (2011) conducted a study putting forth the presence of a statistically significant correlation between rational academic belief and writing anxiety. Balkis (2013) outlined in a previous study that rational beliefs have an intermediary impact on the relationships between academic procrastination, academic life satisfaction and academic success. Putwain, Connors and Symes (2010) illustrated in their study that cognitive distortions have a full intermediary impact between exam anxiety and academic success.

Different from previous studies, the present study has focused on the relations between the specific cognitive distortions of adolescents on academic success and their levels of depression, anxiety and stress. The cognitive theory asserts that anxiety and depression are sustained and strengthened through the cognitive distortions of individuals (Leahy, 2007). According to cognitive-behavioural approaches, distorted perception of reality, that is, cognitive distortions may lead to the onset of anger, depression and anxiety in children (Türkçapar et al., 1995). Cognitive-behavioural approaches deal with how individuals interpret the events they experience and identify and changend identify and change the errors that occur in the cognitive process during the interpretation phase (Stallard, 2002). It can be stated when the importance of childhood and adolescence in the personality development of individuals is taken into consideration that it is necessary to take into consideration unrealistic and dysfunctional ways of thinking at early periods (Çivitçi, 2006). This is also a development period during which delusionary and irrational thoughts emerge (Özbay, 2004). In the light of this information, it is of significant importance to focus on the dysfunctional thoughts of individuals in their adolescence. Information on the cognitive structure of adolescents can be obtained during this period, the possible cognitive faults can be determined and thus the probable emotional problems that may result from these cognitive faults can be prevented (Bilgin, 2004). Indeed, when studies on the problems of children and adolescents are taken into consideration, cognitive behavioral approaches are quite effective. In reviewing 16 meta-analyzes using cognitive behavioral applications, cognitive therapy was found to be a highly effective approach for treating adolescent depression, generalized anxiety disorder, social phobia, and post-traumatic stress disorder, as well as depression and anxiety disorders in children (Butler et al., 2006). Barrett et al. (2001) conducted a study that showed that 85.7% of children with anxiety disorders who were treated with cognitive-behavioral methods no longer showed anxiety symptoms approximately six years later.

Moreover, there are many psycho-education programs developed based on cognitive-behavioural approach and these programs strive to change the dysfunctional thoughts of adolescents and thus to prevent and decreasing their psychological problems (Türk, Buğa, Çekiç, & Hamamcı, 2018). This is because an adolescent's mental well-being directly affects whether he/she engages in risky behaviors (antisocial behavior, alcohol use, smoking, suicidal tendencies, eating habits, dropping out of school). The mental health disorder in adolescents leads to the appearance of various behavioral problems (Körük, 2016).

In conclusion, cognitive-behavioural therapies state that cognitive activities affect behaviors and the desired behavioral changes can be attained through cognitive change (Dobson & Dozois, 2010). Academic success is one of the most important topics in the lives of students and their families. It primarily holds an important place in the lives of many students at certain education levels where success is evaluated comparatively and thus the efforts spent to attain it increase together with the related anxieties (Kaya, 2018). In fact, in Turkey, 2,528,031 students applied for the higher education examination in 2019 and 904,176 of these candidates were granted the right to study (OSYM, 2019). Based on this data, it can be seen that young people face fierce competition in the transition to university and academic life. The analysis of the mental health problems and related factors is important both

for the planning and presentation of the psychosocial services to be provided to the above mentioned group of people (Eskin et al., 2008).

The present study focuses on academic success that stands out during adolescence for individuals along with their related cognitive distortions and the psychological problems of adolescents (depression, anxiety, stress). Hence, it can be stated that acquiring information during this study on the causes of mental problems will contribute to the prevention of these problems as well as the prevention of the secondary consequences of these mental problems. It can be pointed out that preserving the mental health of individuals should be one of the mutual concerns of both education and mental health workers with regard to the process of the adolescents in attaining their academic competencies.

Method

Study Group

The data of the present study were collected from two academic and one vocational education institution making up a total of three secondary schools (high school) institutions continuing their education at the central districts of the Gaziantep province. Data were acquired from a total of 425 people during the first stage however, 14 data were excluded due to data cleansing and outlier analyses. At the end of the data cleansing procedures, of the study group consisting of 411 people, 192 (46,7 %) were female, 219 (53,3 %) were male with 203(49,4%) of the group continuing their education at academic high school whereas 208 (50,6 %) were vocational high school students. The ages of the individuals in the study group varied between 14-18 (x=15,76; Ss= 1,14) with 110 (26,8 %) in the 9^{th} grade, 109 (26,5 %) in the 10^{th} grade, 108 (26,3 %) in the11^{th} grade and 84 (20,4 %) in the12^{th} grade. When the education of the parents of the individuals in the study group was examined, it was found that 32.1% of the mothers had a primary school degree, 28.5% had a secondary school degree, 25.1% had a university degree, and 12.4% had a university degree, while 17.8% of the fathers had a primary school degree, 25.5% had a secondary school degree, 28.2% had a university degree, and 27.3% had a university degree. In addition, 40 (9.7%) of the study participants considered themselves at a low economic level, 340 (82.7%) at a medium economic level, and 31 (7.5%) at a high economic level. 79 (19.2%) received supportive education outside of school, such as private tutoring, etudes, etc. 331 (80.5%) reported receiving no academic support.

Data Collection Tools

Personal information form: The demographic information of the participants, such as gender, age, school and family characteristics, and whether they received academic support outside of school, were collected with a form developed by the researchers.

Depression, Anxiety and Stress Scale (DASS-42) – High School Form: Developed by Lovibond and Lovibond (1995) and adapted into Turkish by Bilgel and Bayram (2010), the validity and reliability studies for the high school form of the scale were carried out by Akkuş-Çutuk and Kaya (2018). DASS-42 comprises 42 with 14 items measuring depression, 14 items measuring anxiety, and 14 items measuring stress. Each score obtained from the sub-dimensions of the scale scored as “Never (0), sometimes (1), frequently (2) and always (3)” shows the level of having the related problem. The lowest score that can be obtained from each sub-dimension of depression, anxiety and stress is 0, whereas the highest score is 42. The scale may include categorical scores if desired, with depression subdimension scores of 0-9 indicating a "normal" level of symptoms, scores of 10-13 indicating a "mild" level of symptoms, scores of 14-20 indicating a "moderate" level, scores of 21-27 indicating a "high" level, and scores of 28 and above indicating a "very high" level of depressive symptoms. In the anxiety subdimension: scores of 0-7 mean "normal", scores of 8-9 mean "mild", scores of 10-14 mean "moderate", scores of 15-19 mean "high" and scores of 20 and above mean "very high"; in the stress subdimension: scores of 0-14 mean "normal", scores of 15-18 mean "mild", scores of 19-25 mean "moderate", scores of 26-33 mean "high" and scores of 34 and above mean "very high" level of stress. As an example, Akkuş-Çutuk and Kaya (2018) conducted a confirmatory factor analysis on 913 high school students as a result of which it was determined that the chi-square value (x^2=3790.21,df=813, p=0.00) is statistically significant and that the fit indices were RMSEA=.063, CFI=.97, GFI=.83, IFI=.97, AGFI=.82, SRMR=.054.Cronbach’s Alfa values of .91 for the depression sub-dimension, .84 for the anxiety sub-dimension and .86 for the stress sub-dimension were obtained for the scale due to the analysis carried out within the scope of the reliability study. The CFA and Cronbach’s Alfa analyses performed within the scope of the present study show that DASS-42 is a valid and reliable tool for this study.

Table 1. The validity (DFA) and reliability (Cronbach's Alpha) analyses of DASS-42 within the scope of this study

Fit Indices	Values
X^2/ sd (2245,72 / 816)	2,75
RMSEA	.07
NNFI	.97
CFI	.97
GFI	.79
SRMR	.06
Cronbach's Alfa values	
Depression	.93
Anxiety	.84
Stress	.88

Cognitive Distortions Scale related to Academic Achievement (CDS-AA): The scale developed by Kaya (2018) for measuring the cognitive distortions of adolescents related to academic achievement has four sub-dimensions and 25 items. Data were collected from 606 high school students within the scope of exploratory, confirmatory factor analysis and reliability studies conducted during the scale development process. A four factor structure explaining 50.87 % of the variance was obtained due to the analyses conducted within the scope of exploratory factor analysis (EFA). Whether the obtained structure can be verified on a different study group was examined. It was determined following the confirmatory factor analysis (CFA) that the four-factor structure is confirmed with the data obtained from EFA (X^2/sd=2,29; RMSEA=.08; NNFI=.95; CFI=.95; SRMR=.08). Cronbach's Alfa (.89), test-retest reliability (.89) and structural reliability (.94) analyses were conducted within the scope of the reliability analyses for the scale and the results put forth that the tool has high reliability values. The 5-point Likert type scale has 4 sub-dimensions: catastrophizing, self-value, outer attribution, and perfectionism. Of these subdimensions, catastrophizing measures the excessive importance attributed to failure and the viewing of failure as a catastrophe, the self-worth subdimension measures the definition of personal worth through academic success, external attribution measures the attribution of success or failure to external factors, and perfectionism measures the rigid and high standards for success. The scale has a minimum score of 25 and a maximum score of 125, with the degree of cognitive bias increasing as the scoreincreases (Kaya, 2018).The CFA and Cronbach's Alfa analyses performed within the scope of the present study indicate that the CDS-AA is a valid and reliable tool for this study.

Table 2. The validity (CFA) and reliability (Cronbach's Alfa) analyses of CDS-AA within the scope of this study

Fit Indices	Values
X^2/ sd (1111.71 / 269)	4,13
RMSEA	.09
NNFI	.95
CFI	.96
GFI	.82
SRMR	.07
Cronbach's Alfa values	
CDS-AA	.93

Data Collection

The study data were collected in the fall semester 2021-2022, three high school institutions: vocational high schools and the other two were academic. High school placement scores were taken as reference criteria for academic high schools when determining the schools for data acquisition. One of the schools selected d high academic success and the other had moderate academic success. Whereas the criteria for the vocational high school displayed diversity concerning educational programs. Since one of the variables examined within the scope

of the study is cognitive distortions related to academic achievement, schools with academically different qualifications were preferred as much as possible in the selection of school type. Discussions were made with the psychological counsellors of the schools prior to data acquisition and the researcher went inside the classroom together with the psychological counsellors during the implementation period. The students were informed about the aim of the study prior to the implementation of the data acquisition tools and it was clearly stated that participation is solely based on the principle of voluntarism. The implementation of the data acquisition tools took about 20 minutes on average.

Data Analysis

Data cleansing was applied before passing onto the data analysis stage. In this scope, the data were excluded for five people who systematically selected the same choice or left more than one item blank. Mahalanobis distance values were taken as reference for examining the outliers in the data set. The data were excluded for nine individuals because they included outlier values. The data structure was examined during the second stage to determine the proper analyses for the data. In this scope, linearity and homoscedasticity analyses were conducted. Normality assumptions were examined by way of skewness and kurtosis values during the study and since it was observed that none of the values exceeded -1 and +1, it was concluded that the data do not have a normality problem(Leech et al., 2005:28). At the same time, linearity and homoscedasticity assumptions were examined via the residual scatterplot (Tabachnick & Fidell, 2014).It was concluded from all the analyses carried out that the data are suited for parametric measurements. In this scope, while independent samples t-test and ANOVA were conducted based on the differentiation of the variables subject to demographic characteristics, the correlation between dependent and independent variables was examined using Pearson Correlation. Finally, linear regression analysis was performed for examining the power of CDS-AA in predicting the variables of depression, anxiety and stress.

Findings

Since it was considered that the distribution of the variables subject to demographic characteristics would contribute to the study, the differentiation of CDS-AA and DASS-42 sub-scales subject to the primary demographic variables was presented prior to examining the relations between the variables.

Table 3. The t-test results for the level of differentiation of DASS-42 and CDS-AA by gender and whether or not to receive out-of-school academic support.

		N	**x**	**SS**	**sd**	**t**	**p**
Depression	Female	192	13,30	9,90	409	2,01	**.045***
	Male	219	11,38	9,40			
Anxiety	Female	192	10,65	6,91	409	2,48	**.01***
	Male	219	8,95	6,94			
Stress	Female	192	17,82	9,04	409	2,64	**.01***
	Male	219	15,57	8,28			
CDS-AA	Female	192	64,36	18,75	409	.82	.41
	Male	219	62,80	19,44			
Depression	Receiving support	79	15,98	10,90	408	3,90	**.00****
	No support	331	11,34	9,12			
Anxiety	Receiving support	79	12,76	8,32	408	4,35	**.00****
	No support	331	9,04	6,43			
Stress	Receiving support	79	19,90	8,62	408	3,48	**.00****
	No support	331	15,81	8,30			
CDS-AA	Receiving support	79	66,22	20,35	408	1,61	.13
	No support	331	62,77	18,79			

n= 411 ** p< .01 * p< .05

When Table 3 was examined, it was concluded that depression, anxiety, and stress scores based on gender are higher at a statistically significant level for women subject to receiving academic support (p< .05). On the other hand, it was observed that CDS-AA did not differ subject to gender and receiving academic support.

At the same time, the ANOVA test conducted for determining the state of differentiation of the variables at the ongoing class levels that CDS-AA does not differ with class level (p> .05) but that depression (p< .01), anxiety

(p< .01) and stress (p< .01) scores differ with the class variable. Tukey from among the Post-hoc tests was used for examining the source of the difference and it was determined that the difference is between the 9th and 10th grades and between the 11th and 12th grades, that the depression, anxiety, and stress score of 12th-grade students were higher at a statistically significant level compared with those of the 9th and 10th-grade students. Following the analysis of the study variables subject to demographic characteristics, Pearson correlation analysis was used for determining the correlation between the variables and the results were presented in Table 4.

Table 4. Mean, standard deviation, skewness/kurtosis and correlation values of research variables

Variables	1	2	3	4
1. CDS-AA	1			
2. Depression	49*	1		
3. Anxiety	45*	74*	1	
4. Stress	43*	73*	73*	1
X	63,53	12,28	9,75	16,62
Ss	19,12	9,67	6,97	8,71
Skewness	.40	.86	.89	.25
Kurtosis	-.27	-.03	.64	-.67

n= 411 * p< .001

As can be seen in Table 4, CDS-AA has a moderate and statistically significant correlation with depression (r=.49; p< .001), anxiety (r=.45; p< .001) and stress (r=.43; p< .001). After determining the correlations between the variables, simple linear regression analysis was carried out for determining the state of CDS-AA scores for predicting depression, anxiety and stress scores. The results of the analyses are presented in tables 5, 6 and 7.

Table 5. Simple linear regression analysis results on the prediction of depression by CDS-AA

Variables	B	SH_B	β	T	F	R	R^2	ΔR^2
Constant	-3,55	1,45		-2,46**	130,91	.49	.24	.24
CDS-AA	.25	.02	.49	11,44*				

n=411; *.01; ** .05

Table 6. Simple linear regression analysis results on the prediction of anxiety by CDS-AA

Variables	B	SH_B	β	T	F	R	R^2	ΔR^2
Constant	-.59	1,07		-.55	101.66	.45	.20	.20
CDS-AA	.16	.02	.45	10.08*				

n=411; *.01;

Table 7. Simple linear regression analysis results on the prediction of stress by CDS-AA

Variables	B	SH_B	β	T	F	R	R^2	ΔR^2
Constant	4,26	1,35		3,15*	91,35	.43	.18	.18
CDS-AA	.20	.02	.43	9,56*				

n=411; *.01;

It was observed when tables 5, 6 and 7 were examined that CDS-AA is a statistically significant predictor of depression (ΔR^2= .24; F_{Reg}= 130,91; p< .01) anxiety (ΔR^2= .20; F_{Reg}= 101,66; p< .01) and stress (ΔR^2= .18; F_{Reg}= 91,35; p< .01). Based on the regression equation set forth, the independent variable of CDS-AA explains 24 % of the variance observed in the depression score, 20 % of the variance observed in the anxiety score and 18 % of the variance observed in the stress score.

Conclusion, Discussion and Recommendations

One of the findings obtained from the present study was that women's depression, anxiety, and stress scores are higher at a statistically significant level than those of men. In examining the relevant literature, it was found that there are many studies that report that depression (Andiç, 2013; Boyd et al., 2000; Costello et al., 2003; Petersen

et al., 1993; Twenge & Nolen-Hoeksema, 2002 Wade et al, 2002), anxiety (Boyd et al., 2000; Lewinsohn et al., 1998; Körük, 2016; Yonkers et al., 2003) and general psychological symptoms (Costello et al., 2003; Karaman, 2018; Serin & Topses, 2017) are more prevalent in adolescents in females than in males. Higher levels of psychological symptoms, depression and anxiety in women can be related with biological, psychological and social reasons (Craske, 2003; Nolen-Hoeksema, 2002). At this point, it can be stated that the result of the present study is by the literature and that it may be beneficial for the effectiveness of mental health protection, prevention and intervention activities especially aimed at adolescents to keep in mind the knowledge that female students are under greater risk.

It was observed in the present study that there was no statistically significant difference in the differentiation subject to the gender of cognitive distortions related to academic success. While Çelikkaleli and Kaya (2016) state that cognitive distortions related relations do not differ subject to gender in university students, Karaman (2018) reported that the intensity of irrational beliefs with similar content to cognitive distortions does not does not differ subject to gender in adolescents. On the other hand, Balkıs and Duru, (2020) set forth that some of the irrational beliefs among depression symptoms differ subject to gender. In this scope, the present study's findings illustrate that female and male students have similar opinions on academic success.

When the depression, anxiety and stress scores of the study group were examined subject to receiving out-of-school academic support, the scores of those who are receiving support have significantly higher scores than those who do not receive out-of-school academic support. In addition, there are also studies that indicate that students receiving support in the form of private lessons and courses display higher academic success than their peers who do not (Başol & Zabun, 2014; Güvendir, 2014). This finding can be considered an indication that those who receive out-of-school academic support during adolescence have higher academic success and struggle with emotional difficulties. It can also be said that focusing on academic studies during adolescence, a time of searching for identity and independence, instead of focusing on sports, cultural and artistic activities that help them discover themselves, increases the likelihood of experiencing negative psychological problems such as depression, anxiety and stress. In this regard, it should be ensured that adolescents do not only lead lives focused on academic success and they should be guided by the family and the education system by their abilities and interests while also being encouraged to spare time for behavioral activities taking into consideration that they are in a period of personality acquisition. In addition, it seems important that institutions that provide academic support to students out of school should provide mental health support as well as success-oriented studies.

Cengiz (2017) conducted a study illustrating that the depression levels of students in the last year of high school were higher at a statistically significant level and that there were no statistically significant differences at the class level with regard toconcerning depression levels. . It was concluded that CDS-AA does not differ subject to class level. However, it was also observed that depression, anxiety and stress scores differ subject to the class variable. It was determined that the difference is between 9th and 10th grades as well as 11th and 12th grades and that tnd 11th and 12th grades. The depression, anxiety and stress scores of 12thgrades were higher at a statistically significant level compared withthan those of the 9th and 10th grades. Contrary to the findings of the present study, there are also other studies which indicate that class levels do not have an impact on the depression, anxiety levels of students (Kanlı, 2011; Türkleş, Hacıhasanoğlu, & Çapar, 2008). The higher levels of depression, anxiety, and stress among the 11th grade students in the present study can be explained by the fact that this is a particularly intense period in Turkey, characterised by the examination system and preparation for university exams, and that students cannot meet their personal needs (athletic, cultural, artistic, etc.) because they lead lives dominated by exam preparation. At this point, the fact that psychological symptoms increase at higher grades despite the lack of significant difference in the cognition levels subject to grade levels can be associated with the emergence of experiences (changes in the individual and social environment with the approaching of the higher education placement examinations). In this regard, focusing on 12^{th} grades in mental health intervention studies; in the protection and prevention studies, it can be said that it is necessary to focus on the 9^{th} and 10^{th} grades..

A moderate and statistically significant correlation was observed between CDS-AA and depression, anxiety and stress. This was the first study to determine the relations between academic success related to cognitive distortions and the variables of depression, anxiety, and stress. In this context, it is observed when a literature survey is made that previous studies have focused more on the relationships between general cognitive distortions, irrational beliefs or academic success and depression, anxiety and stress.

In reviewing studies that examined the relationship between academic success and adolescent mental health, it was found that there is a relationship between academic success and depression (Huang, 2015; McArdle et al., 2014; Sharma & Pandey, 2017; Zychinski & Polo, 2012) and that those who have high academic success (Anlayışlı & Serin, 2019; Eskin et al, 2008) and those who have higher perceptions (Bozkurt, 2004; Turkleş,

Hacıhasanoğlu & Çapar, 2008) have lower levels of depression. Moreover, it can be noted that there is a negative correlation between academic success and anxiety level (Khesht-Masjedi et al., 2019; Seipp, 1991; Sharma & Pandey, 2017) and there is also a negative correlation between academic success and test anxiety, which is a more specific form of anxiety (Steinmayr et al., 2016; Tugan, 2015).Moreover, it has also been determined that stress is a negative predictor of academic success for the majority of students (Liu & Lu, 2011) and that there is a negative correlation between academic success and stress (Ye et al., 2019). In this regard, it can finally be stated that there is a statistically significant and negative relationship between academic success and general mental health symptoms (Masten et al., 2005; Serin and Topses, 2017; Zhang et al., 2019). Moreover, it can also be indicated that there is a relationship between general cognitive distortions and academic success (Usen et al., 2016). Based on all these findings obtained from research studies, it can be concluded that the two variables of academic success and mental health are related, even though a causal relationship cannot be established between the two. The academic success of students was not measured directly within the scope of this study and instead, their expectations from and the meaning they attribute to academic success were examined as a result of which it was determined that similar to academic success, the variables as mentioned earlier are also related with mental health.

One of the primary research questions of the present study was identifying the level of prediction of cognitive distortions related with academic success concerning depression, anxiety and stress symptoms. The analyses carried out within the scope of this question put forth that CDS-AA predicts all three psychological symptoms at a statistically significant level. Cognitive-behavioral therapy, as one of the theories based on the assumption that there is a relationship between cognitions and mental health, assumes that cognitive biases (Beck, 1979; Beck, 2006) are related to psychological symptoms, whereas rational-emotional behavioral therapy assumes that irrational beliefs are related to psychological symptoms (Terán et al., 2020; Browne, Dowd, &Freeman, 2010).Various meta-analysis studies have also determined a correlation between irrational beliefs and psychological problems (Oltean & David, 2018; Vîslă et al., 2016). In addition, there are also studies which show that irrational beliefs are correlated with depression (Buschmann et al., 2018) stress (Yildiz et al., 2018) and anxiety(Çetin & Ceyhan, 2017). There are many studies reporting that cognitive distortions are related to depression (Marcotte, Lévesque & Fortin, 2006; Tairi, 2020; Usen et al., 2016), internalizing behavior problems (Leung & Wong, 1998), life events perceived as stressful (Deal & Williams, 1988; Dhanalakshmi, 2015), and anxiety (Tairi, 2020; Tekguel, 2015) in adolescents.On the other hand, meta-analysis studies put forth that CBT based intervention programs effectively affect the depression and anxiety levels of children and adolescents (Compton et al., 2004; Muñoz-Solomando et al., 2008; Reinecke et al., 1998). The finding of related literature indicating that the individuals' system of thinking is correlated with psychological symptoms and that thoughts are effective on mental health has also been supported with the present study results. This study has specifically focused on the cognitive attributes of adolescents based on the meaning ascribed to academic success which holds an important position in their lives. Study findings show that the mental health symptoms of high school students in Turkey are significantly affected from the cognitive distortions related with academic success. The fact that transition to higher education institutions in Turkey is mostly governed by central examinations. Students pass many assessments based on academic success when planning their future lives may have resulted in the high ratios of the variance explained by CDS-AA in the study. At this point, there is a possibility that different results may be obtained for education systems that are not central examination driven or that are not as success-centric. Based on these assessments, using CDS-AA for examining variables of students such as future expectations, academic procrastination, academic competence and levels of hope and carrying out similar studies in education systems or cultures that give less importance to success may contribute to a better understanding of the data acquired during the present study.

According to this result obtained for the main objective of the present study, it can be concluded that reducing cognitive biases related to academic success will have a preventive and protective effect on adolescent mental health. Indeed, cognitive behavioral approaches are concerned with how individuals interpret the events they experience and how they can determine and change the errors that occur during this interpretation phase in the cognitive process (Stallard, 2002:3). According to the results of the present study, it can be suggested to conduct individual or psychoeducational studies based on cognitive behavioral therapy (Butler et al., 2006), which is one of the most effective approaches for children and adolescents. In fact, there are many psychoeducation programs based on CBT that have been developed and aim to change the dysfunctional thoughts of adolescents and thus prevent and reduce their psychological problems (Turk, Buğa, Çekiç & Hamamcı, 2018).In addition, today, there are also many CBT based protective and preventive programs for protecting the mental health of individuals that have been developed not only based on traditional face-to-face methods but also on many other web-based interactive or computer-based technologies (Buğa & Hamamcı, 2020). In this context, it can be said that CBT-based studies are effective and one of the best methods that enables access to both children and adolescents. The findings of this study show that cognitive distortions related to academic achievement should be included in

mental health programs to be prepared for high school students. Lastly, considering that one of the sources of cognitive distortions related to academic achievement is parental attitudes (Kaya, 2020), it shows that parents' achievement expectations should be questioned to reduce adolescents' depression, anxiety, and stress levels.

Finally, the use of a simple linear regression rather than a multiple regression model to examine the effects of CDS-AA on depression, anxiety, and stress may be considered a limitation. However, at this point, we first attempted multiple regressions using the LISREL and AMOS software packages. Although the path coefficients in both software packages were statistically significant, the analyses were performed with simple regression because the goodness-of-fit index, indicating the agreement between the model and the data, was less than the acceptable limits.

Author (s) Contribution Rate

The authors contributed equally to the study

Conflicts of Interest

No potential conflict of interest was reported by the authors.

Ethical Approval (only for necessary papers)

Ethical permission (01.10.2021-93638) was obtained from Gaziantep University's Social and Humanities Sciences Ethics Committee for this research.

References

Akkuş-Çutuk, Z., & Kaya, M. (2018). Depresyon, anksiyete ve stres ölçeği (DASS-42) lise formu: Türkçe geçerlik ve güvenirliği. *Electronic Journal of Social Sciences, 17*(68):1327-1336.

Andiç, S. (2013). *Ergenlik döneminde zihni meşgul eden konularla ilişkili değişkenler: Bağlanma tarzları, öz-şefkat ve psikolojik belirtiler.* (Unpublished master thesis), Ankara University, Sosyal Bilimler Enstitüsü, Ankara.

Anlayışlı, C. & Serin, N. B. (2019). Lise öğrencilerinde internet bağımlılığı ve depresyonun cinsiyet, akademik başarı ve internete giriş süreleri açısından incelenmesi. *Folklor/edebiyat, 25*(97), 753-767.

Atkinson, P. B. (2011). Exploring correlations between writing apprehension, academic rational beliefs, and stress and coping behaviors in college students. *Proceedings of the New York State Communication Association, 2010, 1-24.* http://docs.rwu.edu/nyscaproceedings/vol2010/iss1/1

Balkıs, M., & Duru, E. (2020).Gender differences in the organizational structure of the rational/ırrational beliefs in depressive symptoms. *Journal of Rational-Emotive & Cognitive-Behavior Therapy, 38*, 272-294.

Balkıs, M. (2013). Academic procrastination, academic life satisfaction and academic achievement: The mediation role of rational beliefs about studying. *Journal of Cognitive and Behavioral Psychotherapies, 13*(1), 19.

Balkıs, M., Duru, E., & Bulus, M. (2013). Analysis of the relation between academic procrastination, academic rational/irrational beliefs, time preferences to study for exams, and academic achievement: A structural model. *European Journal of Psychology of Education, 28*(3), 825–839. https://doi.org/10.1007/s10212-012-0142-5

Barrett, P. M., Duffy, A. L., Dadds, M. R., & Rapee, R. M. (2001). Cognitive–behavioral treatment of anxiety disorders in children: Long-term (6-year) follow-up. *Journal of Consulting and Clinical Psychology, 69*(1), 135.

Başol, G., & Zabun, E. (2014). The predictors of success in turkish high school placement exams: exam prep courses, perfectionism, parental attitudes and test anxiety. *Educational Sciences: Theory & Practice, 14*(1),78-87. https://doi.org/10.12738/estp.2014.1.1980

Beck, A. T. (1979). Cognitive therapy and the emotional disorders. Penguin.

Beck, J. S. (2006).Bilişsel davranışçı terapi: Temelleri ve ötesi. Nobel Akademik Yayıncılık.

Bilgel, N. & Bayram, N. (2010). Turkish version of the depression anxiety stress scale (DASS-42): *Psychometric Properties. Archives of Neuropsychiatry/Noropsikiatri Arşivi, 47*(2):118-126.

Bilgin, M. (2004). Bilişsel üçlü ölçeğinin geliştirilmesi: Geçerlik ve güvenirlik çalışmaları. *Türk Psikolojik Danışma ve Rehberlik Dergisi, 3*(21), 35-41.

Boyd, C. P., Gullone, E., Kostanski, M., Ollendick, T. H., & Shek, D. T. L. (2000). Prevalence of anxiety and depression in australian adolescents: Comparisons with worldwide data. *The Journal of Genetic Psychology, 16*1(4), 479-492. https://doi.org/10.1080/00221320009596726

Bozkurt, N. (2004). Bir grup üniversite öğrencisinin depresyon ve kaygı düzeyleri ile çeşitli değişkenler arasındaki ilişkiler. *Eğitim ve Bilim*, *29*(133), 52-59.

Browne, C. M., Dowd, E. T., & Freeman, A. (2010). Rational and irrational beliefs and psychopathology. *Rational and irrational beliefs: Research, theory, and clinical practice*, 149-172.

Buğa, A. & Hamamcı, Z. (2020). Bilişsel davranışçı terapiler ve teknolojik uygulamalar. (Hamamcı, Z. & Türk, F., Eds.). *Geçmişten geleceğe bilişsel davranışçı terapi*. Pegem Akademi Yayıncılık.

Buschmann, T., Horn, R. A., Blankenship, V. R., Garcia, Y. E., & Bohan, K. B. (2018). The relationship between automatic thoughts and irrational beliefs predicting anxiety and depression. *Journal of Rational-Emotive & Cognitive-Behavior Therapy, 36*(2), 137-162. https://doi.org/10.1007/s10942-017-0278-y

Butler, A.C., Chapman, J.E., Forman, E.M. & Beck, A.T. (2006). The empirical status of cognitive-behavioral therapy: a review of meta-analyses. *Clinical Psychology Review, 26*, 17-31.

Cengiz, S. (2017). *Ergenlerde duygusal tepkisellik, bilişsel çarpıtmalar ve depresyon arasındaki ilişkinin incelenmesi*. (Unpublished master thesis). Atatürk University, Erzurum.

Compton, S. N., March, J. S., Brent, D., Albano, A. M., Weersing, V. R., & Curry, J. (2004). Cognitive-behavioral psychotherapy for anxiety and depressive disorders in children and adolescents: An evidence-based medicine review. *Journal of the American Academy of Child & Adolescent Psychiatry, 43*(8), 930–959.

Costello, E. J., Mustillo, S., Erkanli, A., Keeler, G., & Angold, A. (2003).Prevalence and development of psychiatric disorders in childhood and adolescence. *Archives of General Psychiatry, 60*(8), 837–844. https://doi.org/10.1001/archpsyc.60.8.837

Craske, M. G. (2003). Origins of phobias and anxiety disorders: Why more women than men? Elsevier.

Çelikkaleli, Ö.,& Kaya, S. (2016). University students' interpersonal cognitive distortions, psychological resilience, and emotional self-efficacy according to sex and gender roles. *Pegem Journal of Education and Instruction*, *6*(2), 187–212. http://dx.doi.org/10.14527/pegegog.2016.011

Çetin, N. & Ceyhan, E. (2018). Lise öğrencilerinin akademik erteleme davranışlarının sürekli kaygı, akılcı olmayan inanç, öz düzenleme ve akademik başarı ile ilişkisi. *Hacettepe University Eğitim Fakültesi Dergisi*,*33*(*2*),460-479.

Çivilidağ, A. (2013). *Gelişim süreci odağında ergenlik psikolojisi*. Nobel Yayıncılık.

Çivitçi, A. (2006). Ergenler için mantıkdışı inançlar ölçeğinin geliştirilmesi: Geçerlik ve güvenirlik çalışmaları. *Türk Psikolojik Danışma ve Rehberlik Dergisi*, *3*(25):69-80.

Deal, S. L., & Williams, J. E. (1988). Cognitive distortions as mediators between life stres and depression in adolescents. *Adolescence*, *23*(90), 477-490.

Dhanalakshmi, D. (2015). Perceived stress, cognitive distortion, sense of coherence and health among college students.*Indian Journal of Health and Wellbeing, 6*(3), 287.

Dobson, K.S. & Dozois, D.J.A. (2010). Historical and philosophical bases of the cognitive- behavioral therapies. Dobson, K.S. (Ed.). *In Handbook of Cognitive-Behavioral Therapies,*. Guilford Publications.

Eskin, M., Ertekin, K., Harlak, H., & Dereboy, Ç. (2008). Lise öğrencisi ergenlerde depresyonun yaygınlığı ve ilişkili olduğu etmenler. *Türk Psikiyatri Dergisi, 19*(4), 382-389.

Güvendir, M. A. (2014). Öğrenci başarılarının belirlenmesi sınavında öğrenci ve okul özelliklerinin türkçe başarısı ile ilişkisi. *Eğitim ve Bilim, 39*(172), Article 172. http://213.14.10.181/index.php/EB/article/view/2839

Huang, C. (2015). Academic achievement and subsequent depression: A meta-analysis of longitudinal studies. *Journal of Child and Family Studies, 24*(2), 434–442. https://doi.org/10.1007/s10826-013-9855-6

Kanlı, E. (2011). Üstün zekâlı ve normal ergenlerin mükemmeliyetçilik, depresyon ve kaygı düzeyleri arasındaki ilişkilerin incelenmesi. *M.Ü. Atatürk Eğitim Fakültesi Eğitim Bilimleri Dergisi, 33, 103-121.*

Kapali, G. D., Neupane, S., & Panta, G. (2019). A Study on academic stress, parent adolescent relationship with parents and academic achievement of adolescent students. *Journal of Health and Allied Sciences*, *9*(2), 70–74. https://doi.org/10.37107/jhas.133

Karaman, H. (2018). *15-18 yaş ergenlerde akilci olmayan inançlar ve psikolojik belirtiler.* (Unpublished master thesis), Nişantaşı University,Istanbul.

Kaya, İ. (2018). Akademik başarıya ilişkin bilişsel çarpıtmalar ölçeğinin (ABİBÇÖ) geliştirilmesi. *Mersin University Eğitim Fakültesi Dergisi*, *14*(3), 1082-1098.

Kaya, İ. (2020). Ergenlerde Akademik Başarıya İlişkin Bilişsel Çarpıtmalar ile Algılanan Anne Baba Tutumu Arasındaki İlişki . *OPUS International Journal of Society Researches* , Eğitim ve Toplum Özel sayısı , 5565-5584 . DOI: 10.26466/opus.791965

Khesht-Masjedi, M. F., Shokrgozar, S., Abdollahi, E., Habibi, B., Asghari, T., Ofoghi, R. S., & Pazhooman, S. (2019). The relationship between gender, age, anxiety, depression, and academic achievement among teenagers. *Journal of Family Medicine and Primary Care, 8*(3), 799–804. https://doi.org/10.4103/jfmpc.jfmpc_103_18

Körük, S. (2016). *Ergenlerde riskli davranışların güvensiz bağlanma ve algılanan sosyal destek tarafından yordanmasında psikolojik belirtilerin aracı rolü*. (Unpublished master thesis), Eskişehir Osmangazi University, Eskişehir.

Leahy, R.L. (2007). *Bilişsel terapi yöntemleri*. Türkçapar, H. & Köroğlu, E. (Çev.), HYB Yayıncılık.

Leech, N. L., Barrett, K. C., & Morgan, G. A. (2005).Spss for intermediate statistics: Use and implementation. Mahwah, NJ: Lawrence Erlbaum Associates.

Leung, P. W. L. & Poon, M. W. L. (2001). Dysfunctional schemas and cognitive distortions in psychopathology: A test of the specificity hypothesis. *Journal of Child Psychology and Psychiatry*, *42*(6), 755-765.

Lewinsohn, P. M., Gotlib, I. H., Lewinsohn, M., Seeley, J. R., & Allen, N. B. (1998).Gender differences in anxiety disorders and anxiety symptoms in adolescents. *Journal of Abnormal Psychology, 107*(1), 109–117. https://doi.org/10.1037/0021-843X.107.1.109

Liu, Y., & Lu, Z. (2011).The Chinese high school student's stress in the school and academic achievement. *Educational Psychology, 31*(1), 27-35. https://doi.org/10.1080/01443410.2010.513959

Marcotte, D.,Lévesque, N., &Fortin, L. (2006). Variations of cognitive distortions and school performance in depressed and non-depressed high school adolescents: A two-year longitudinal study. *Cognitive Therapy and Research*, *30*: 211-225.

Masten, A. S., Roisman, G. I., Long, J. D., Burt, K. B., Obradović, J., Riley, J. R., Boelcke-Stennes, K., & Tellegen, A. (2005). Developmental cascades: Linking academic achievement and externalizing and ınternalizing symptoms over 20 years. *Developmental Psychology, 41*(5), 733-746. https://doi.org/10.1037/0012-1649.41.5.733

McArdle, J. J., Hamagami, F., Chang, J. Y., & Hishinuma, E. S. (2014). Longitudinal Dynamic Analyses of Depression and Academic Achievement in the Hawaiian High Schools Health Survey Using Contemporary Latent Variable Change Models. *Structural Equation Modeling: A Multidisciplinary Journal, 21*(4), 608–629. https://doi.org/10.1080/10705511.2014.919824

Muñoz-Solomando, A., Kendall, T., & Whittington, C. J. (2008).Cognitive behavioural therapy for children and adolescents. *Current Opinion in Psychiatry, 21*(4), 332. https://doi.org/10.1097/YCO.0b013e328305097c

Nolen-Hoeksema, S. (2002).Gender differences in depression.In Handbook of depression (pp. 492–509).The Guilford Press.

Oltean, H.-R., & David, D. O. (2018).A meta-analysis of the relationship between rational beliefs and psychological distress. *Journal of Clinical Psychology, 74*(6), 883–895.

ÖSYM (2019). 2019 YKS Yerleştirme Sonuçlarına İlişkin Sayısal Bilgiler. Erişim Tarihi: 16.05.2020. https://www.osym.gov.tr/TR,16889/2019-yks-yerlestirme-sonuclarina-iliskin-sayisal-bilgiler.html

Özbay, Y. (2004). *Gelişim ve öğrenme psikolojisi, kuram-araştırma-uygulama* (5.Ed.). Pegem Yayıncılık.

Petersen, A. C., Compas, B. E., Brooks-Gunn, J., Stemmler, M., Ey, S., & Grant, K. E. (1993).Depression in adolescence. *American Psychologist, 48*(2), 155–168. https://doi.org/10.1037/0003-066X.48.2.155

Putwain, D. W., Connors, L. ve Symes, W. (2010). Do cognitive distortions mediate the test anxiety–examination performance relationship? *Educational Psychology*, *30*(1), 11-26.

Reinecke, M. A., Ryan, N. E., & DuBOIS, D. L. (1998). Cognitive-behavioral therapy of depression and depressive symptoms during adolescence: A review and meta-analysis. *Journal of the American Academy of Child & Adolescent Psychiatry*, *37*(1), 26–34. https://doi.org/10.1097/00004583-199801000-00013

Savi-Cakar, F. (2014). The effect of automatic thoughts on hopelessness: Role of self-esteem as a mediator. *Educational Sciences: Theory and Practice*, *14*(5), 1682-1687.

Seipp, B. (1991). Anxiety and academic performance: A meta-analysis of findings. *Anxiety Research*, *4*(1), 27-41. https://doi.org/10.1080/08917779108248762

Serin, N. B. & Topses, G. (2017). Lise öğrencilerinde görülen psikolojik belirtilerin cinsiyet ve akademik başarı açısından incelenmesi. *Turkish Studies, 12* (18), 157-172.

Sharma, G., & Pandey, D. (2017). Anxiety, depression, and stress in relation to academic achievement among higher secondary school students. *The International Journal of Indian Psychology*, *4*(2), 82–89.

Stallard, P. (2002). *Think good-feel good: a cognitive behaviour therapy workbook for children and young people*. John Wiley an Sons Ltd.

Steinmayr, R., Crede, J., McElvany, N., & Wirthwein, L. (2016). Subjective well-being, test anxiety, academic achievement: Testing for reciprocal effects. *Frontiers in Psychology, 6(1994)*. https://doi.org/10.3389/fpsyg.2015.01994

Suadiye, Y., &Aydın, A. (2009).Anksiyete bozukluğu olan ergenlerde bilişsel hatalar. *Klinik Psikiyatri Dergisi, 12*(4), 172–179.

Tabachnick, B. G., & Fidell, L. S. (2014).Using multivariate statistics (Pearson new international edition, sixth edition). Pearson.

Tairi, T. (2020).Associations between cognitive errors and mental health status in New Zealand adolescents. *Behavioural and Cognitive Psychotherapy, 48*(3), 280-290. https://doi.org/10.1017/S1352465819000626

Tekgül, N. (2015). *Ergenlik döneminde bilişsel odaklı psikoeğitim programının kaygı düzeyi, akademik başarı ve bilişsel hatalar ile etkileşiminin incelenmesi*. (Unpublished master thesis). Maltepe University. Istanbul.

Tems, C. L., Stewart, S. M., Jr, J. R. S., Hughes, C. W., & Emslie, G. (1993). Cognitive distortions in depressed children and adolescents: Are they state dependent or traitlike? *Journal of Clinical Child Psychology*, *22*(3), 316–326. https://doi.org/10.1207/s15374424jccp2203_2

Terán, V. G., Velásquez, E. E., & Fuentes, M. A. (2020). Irrational thinking and psychological distress: A cross-racial/ethnic examination. *Personality and Individual Differences, 164*. https://doi.org/10.1016/j.paid.2020.110102

Tugan, S. E. (2015). Lise öğrencilerinde sınav kaygısı ve akademik başarı ilişkisi. *Karaelmas Eğitim Bilimleri Dergisi, 3*, 98-106. http://ebd.beun.edu.tr/index.php/KEBD/article/view/62

Türk, F., Buğa, A., Çekiç, A., & Hamamcı, Z. (2018). Bilişsel davranışçı yaklaşıma dayalı grup müdahalelerinin çocuk ve ergenlerin işlevsel olmayan düşünceleri üzerindeki etkisi: Meta analiz çalışması. *Türk Psikolojik Danışma ve Rehberlik Dergisi, 8*(49), 45-61.

Türkçapar, M.H., Sungur, M.Z. & Akdemir, A. (1995). Çocuk ve ergenlerde bilişsel terapiler. *Çocuk ve Gençlik Ruh Sağlığı Dergisi*, *2*(2):93-100.

Türkleş, S., Hacıhasanoğlu, R., & Çapar, S. (2008). Lise öğrencilerinde depresyon düzeyi ve etkileyen faktörlerin incelenmesi. *Atatürk üniversitesi Hemşirelik Yüksekokulu Dergisi*, *11*(2), 18-28.

Twenge, J. M., & Nolen-Hoeksema, S. (2002). Age, gender, race, socioeconomic status, and birth cohort difference on the children's depression inventory: A meta-analysis. *Journal of Abnormal Psychology, 111*(4), 578.

Usen, S. A., Eneh, G. A. & Udom, I. E. (2016).Cognitive distortion as predictor of ın-school adolescents' depressive symptoms and academic performance in south-south, nigeria. *Journal of Education and Practice, 7*(17), 23-27.

Vîslă, A., Flückiger, C., Holtforth, M. grosse, & David, D. (2016). Irrational beliefs and psychological distress: A meta-analysis. *Psychotherapy and Psychosomatics, 85*(1), 8-15. https://doi.org/10.1159/000441231

Wade, T. J., Cairney, J., & Pevalin, D. J. (2002). Emergence of gender differences in depression during adolescence: National panel results from three countries. *Journal of the American Academy of Child & Adolescent Psychiatry, 41*(2), 190–198. https://doi.org/10.1097/00004583-200202000-00013

Ye, L., Posada, A., & Liu, Y. (2019). A review on the relationship between chinese adolescents' stress and academic achievement. *New Directions for Child and Adolescent Development, 2019* (163), 81–95. https://doi.org/10.1002/cad.20265

Ye, L., Posada, A., & Liu, Y. (2019). A review on the relationship between chinese adolescents' stress and academic achievement. *New Directions for Child and Adolescent Development, 2019*(163), 81-95. https://doi.org/10.1002/cad.20265

Yıldız, M. A., Baytemir, K., & Demirtas, A. S. (2018). Irrational beliefs and perceived stress in adolescents: The role of self-esteem. *Journal of Educational Sciences and Psychology, 8*(1).

Yonkers, K. A., Bruce, S. E., Dyck, I. R., & Keller, M. B. (2003). Chronicity, relapse, and illness—course of panic disorder, social phobia, and generalized anxiety disorder: Findings in men and women from 8 years of follow-up. *Depression and Anxiety, 17*(3), 173–179. https://doi.org/10.1002/da.10106

Zhang, W., Zhang, L., Chen, L., Ji, L., & Deater-Deckard, K. (2019). Developmental changes in longitudinal associations between academic achievement and psychopathological symptoms from late childhood to middle adolescence. *Journal of Child Psychology and Psychiatry, 60*(2), 178-188. https://doi.org/10.1111/jcpp.12927

Zychinski, K. E., & Polo, A. J. (2012).academic achievement and depressive symptoms in low-ıncome latino youth. *Journal of Child and Family Studies, 21*(4), 565–577. https://doi.org/10.1007/s10826-011-9509-5

International Journal of Contemporary Educational Research (IJCER)

www.ijcer.net

The Mediator Role of Resilience in the Relationship between Sensation-Seeking, Happiness and Subjective Vitality

Furkan Kaşıkcı[1], Adem Peker[2]
[1]Ataturk University, 0000-0002-1042-1920
[2]Ataturk University, 0000-0002-3594-9166

Article History
Received: 21.08.2021
Received in revised form: 27.01.2022
Accepted: 06.02.2022
Article Type: Research Article

To cite this article:

Kaşıkcı, F. & Peker, A. (2022). The mediator role of resilience in the relationship between sensation-seeking, happiness and subjective vitality. *International Journal of Contemporary Educational Research, 9*(1), 115-129. https://doi.org/10.33200/ijcer.985610

International Journal of Contemporary Educational Research

Volume 9, Number 1, March 2022, 115-129 ISSN: 2148-3868

The Mediator Role of Resilience in the Relationship between Sensation-Seeking, Happiness and Subjective Vitality

Furkan Kaşıkcı[1*], Adem Peker[1]
[1]Ataturk University

Abstract

Sensation-seeking, subjective vitality and happiness are interrelated constructs in the current literature. However, there is currently no research on how the relationship between these concepts is affected. This research aims to examine the mediating effect of resilience in the relationship between them, thus bridging a large gap in the field. The group of participants in the research consisted of 519 university students; 384 (74%) of them women and 135 (26%) of them men. In addition, the average age of the participants was 20.17 (Sd = 1.36). We used sensation seeking, resilience, subjective vitality and Oxford happiness scales in the research. We used mediation analysis to determine the indirect effect of resilience between sensation seeking and subjective vitality and happiness. The results revealed a minor, positively significant relationship between sensation seeking and resilience, subjective vitality, and happiness, indicating that resilience plays a mediating role in the relationship between the concepts of. Moreover, a high level of psychological resilience increases subjective vitality and happiness. Based on these findings, guidance and psychological counselors in schools may be able to better guide improving students' mood.

Keywords: Happiness, Resilience, Sensation seeking, Subjective vitality, Positive psychology

Introduction

As a psychosocial creature, the human being makes important decisions at various stages of development. These developmental periods present various opportunities or challenges for individuals. The transition to university is a period that begins before adulthood, in which young people must develop personally, socially and academically. Arnett (2000) defines this period as “emerging adulthood,” in which people first experience staying away from their families, have limited social support, shelter, nutrition and other financial issues. This situation presents an important source of risk for students (Coyne et al., 2020). These sources of risk negatively affect adolescents' adaptation to university life and their psychological health (Kasikci, 2020), happiness being the most important indication of the latter among young people.

In field, the concept of happiness is multifaceted. According to the most widely accepted subjective model of well-being aimed at defining the happiness of adults, happiness is defined as a 3-component structure that includes life satisfaction and positive and negative emotion. Diener (2000) sees this 3-component structure as a general perception of happiness. Seligman et al. (2005) conceptualize happiness as a structure consisting of three dimensions: pleasure, meaning, and commitment. People follow this 3-way component, respectively, to be happy. Seligman (2011) emphasizes positive emotion as an important factor for happiness.

The concept of happiness in the related literature is used together with the concept of well-being, although. In a meta-analysis study, Lyubomirsky et al. (2005) found that happiness resulted in 50% genetic factors, 10% demographic factors, and 40% purpose actions (such as gratitude, meaning, social support, and hope). However, Seligman (2011) describes happiness as a "thing" in this regard and well-being a "structure" – a multidimensional concept consisting of the sum of different components.

* Corresponding Author: *Furkan Kaşıkcı, furkan.kasikci@atauni.edu.tr*

Subjective vitality means that the individual feels content, energetic – spiritually and physically – and can unlock their own potential (Brunstein & Maier, 2002). Similarly, Ryan and Frederick (1997) define subjective vitality as a state of physical and mental well-being. In addition, Deci and Ryan (2008) express subjective vitality as an important component of psychological well-being and eudemonic well-being. In this situation, studies have shown that individuals with high subjective vitality can be more productive and cope more easily in stressful situations (Martin-Cuellar et al., 2019; Penninx et al., 2000; Ugur et al., 2019). Individuals with higher subjective vitality have more energy to perform activities and tasks (Deci & Ryan, 2008). As a result, high subjective vitality can contribute to the psychological well-being of individuals in line with self-determination theory, which addresses how purposeful actions can explain subjective vitality and argues that subjective vitality enhances well-being through intentional actions (Salama-Younes, 2011). Moreover, there are significant relationships between subjective vitality, curiosity, and proactive personality (Celik & Topcuoglu, 2017).

The Relationship between Sensation-Seeking and Happiness-Subjective Vitality

Zuckerman (2007) defined sensation-seeking as a form of courage based on exploring and experiencing new situations. Individuals with high excitement-seeking may nurture an interest in extreme sports, such as mountaineering and skiing (Klinar et al., 2017; Stephenson & Southwell, 2006). However, those with low levels of sensation-seeking are seen to avoid activities that increase their stimulation level (Renfro et al., 2013; Sulejmanov et al., 2018). Furthermore, individuals with high sensation-seeking levels generally see risk rates as less concerning in otherwise heavily risk-involved activities. In this sense, those who seek heightened sensations have higher participation rates in risky activities and exhibit similarly low avoidance behavior (Zuckerman & Kuhlman, 2000).

However, no research appears to have been conducted into the links between sensation-seeking, subjective vitality and happiness among university students – despite the presents of studies linking sensation-seeking, subjective vitality and happiness with various other concepts. For example, Farahani et al. (2011) and Neshat et al. (2009) found that athletes' sensation seeking predicts happiness, while Ma (2018) found a significant relationship between sensation seeking and happiness levels in individuals who use the Internet problematically, and Asgari et al. (2016) showed that there is a significant relationship between fertile women's sensation seeking and their happiness. Reis et al. (2020), meanwhile, found that the exercise game on sensation seeking in the virtual environment predicted subjective vitality. Sensation seeking predicts attitudes towards violence (Kaya et al., 2019). Students' level of life satisfaction with low excitement-seeking decreases (Celik & Turan, 2016). There are significant relationships between sensation seeking and life satisfaction, proactive personality (Celik & Raba, 2017), self-concealment (Celik, 2015), loneliness (Batmaz & Celik, 2021) and general self-efficacy (Celik & Kocak, 2018).

The Mediator Role of Resilience

The importance of studies on reducing the effects of negativity has increased in the last few years, with the concept of resilience having become the subject of much research to assist specific occupational groups (Chmitorz et al., 2018; Sagone et al., 2020). Masten et al. (2006) define resilience as the ability to summon the energy necessary to take action, recover successfully, and return to normal when faced with challenges that negatively affect an individual's development and well-being. In the context of positive "psychology," which suggests the need to develop the strengths and positive aspects of individuals, resilience is conceptualized by focusing on qualities that enable the person to self-correct and develop in the face of difficulties, instead of focusing on the negative effects of risk processes (Connor & Davidson, 2003).

Contemporary theorists describe endurance as a complex, multidimensional structure characterized by dynamic interactions between individuals and their social ecology (Betancourt & Khan, 2008; Ungar, 2012). On the other hand, instead of focusing on the shortcomings and weaknesses of individuals, the "positive psychology approach" focuses on strengths, positive aspects, happiness, and positive emotions. In this sense, it is important to define the protective factors that enable individuals to develop positive coping strategies in stressful situations. One of these protective factors is resilience. Researchers define psychological resilience in terms of risk factors, protective factors and adaptive behaviors in the face of negativity (Naglieri et al., 2013; Rutter, 2006).

The above studies reveal that resilience positively affects mental health (Benetti & Kambouropoulos, 2006; Mak et al., 2011; Schwarzer & Warner, 2013). In this context, resilience can be considered among some of the resources that can positively affect happiness and subjective vitality. Although previous studies provide evidence that resilience predicts happiness, these studies – conducted among immigrants (Brailovskaia et al., 2019), those with psychopathology (Bachik et al., 2020), student nurses (Benada & Chowdhry, 2017), and secondary school students (Pourkord et al., 2020) – have key limitations. For instance, although Garg and Sarkar (2020) reveal that

resilience predicts subjective vitality in university students, they do not provide any findings on how this relationship is affected. Therefore, little is known about how resilience affects normally developing university students' subjective vitality and happiness levels.

Purpose of the Present Study

Although previous studies have provided evidence that sensation-seeking is associated with happiness levels (Hajloo & Pezeshki, 2013) and subjective vitality (Reis et al., 2020), information on how this relationship is affected is scarce. Recent studies have revealed how resilience affects the relationship between happiness and extraversion and neuroticism (Lü et al., 2014), and between stigma and happiness (Cho & Ryu, 2021) in lung cancer patients. However, these studies were not conducted on normally developing university students. A similar situation can also be seen in studies on the concept of subjective vitality. For example, Akin et al. (2016) have examined the mediating effect of mindfulness on the relationship between friend quality and subjective vitality; Martin-Cuellar et al. (2019) have demonstrated the multilevel mediating relationship of psychological well-being and compassion between mindfulness and subjective vitality; while Tristan et al. (2021) have presented findings on how psychological needs influence the relationship between feedback and subjective vitality. The studies mentioned above show that there is a need for evidence, however, on how resilience affects the relationship between sensation seeking, happiness and subjective vitality in university students.

Sensation-seeking can constitute a precursor to subjective vitality and happiness. However, resilience, including preventive and protective properties, can increase subjective vitality and happiness. Therefore, examining the mediating role of resilience may illuminate the mechanisms between sensation seeking and subjective vitality and happiness. With this in mind, the research aims to examine the mediating role of resilience in the relationship between sensation seeking, happiness, and subjective vitality.

Thus, the hypotheses in the research were formed as follows.

H_1: Resilience mediates the relationship between sensation seeking and subjective vitality.
H_2: Resilience mediates the relationship between sensation seeking and happiness.

Method

Participants

519 university students, including 384 (74%) women and 135 (26%) men, participated in this study. In terms of participants' class levels, 345 (66,5%) were first-year students, 45 (8,7%) were second-year students, 42 (8,1%) were third-year students and 87 (16,8%) were fourth year students. In addition, the participants were between the ages of 18 and 21, and the average age of the participants was 20.17 (Sd = 1.36). Participants are studying in the education faculty and preschool, guidance and psychological counselling, and special education teaching departments.

Measures

The sensation-seeking, resilience, Oxford happiness and subjective vitality scales, and a personal information form were used in the data collection process.

Sensation Seeking Scale – Short Form

The sensation-seeking scale developed by Stephenson et al. (2003) was adapted to Turkish by Celik (2015). The Sensation-Seeking Scale consists of four items in total. In addition, the reliability coefficient was found as .81 in the adaptation study of the scale into Turkish. During the adaptation process, Exploratory Factor analysis was conducted to test the scale's construct validity, and it was concluded that the item factor loads of the scale were between .74 and .84. Within the scope of this research, the Cronbach Alpha (α) and McDonald (ω) values were calculated to determine the level of reliability of the scale, with both reliability coefficients coming to .82.

Resilience Scale – Short Form

The Resilience Scale developed by Smith et al. (2008) to determine the levels of resilience of adults was adapted to Turkish by Dogan (2015). The Resilience Scale consists of 6 items in total. High scores from the scale indicate high resilience. The reliability of the scale was calculated by internal consistency and test re-test methods, with the values of its internal consistency reliability coefficient ranging from .80 to .91 were reached. The test re-test reliability coefficient was found to be between .62 and .69. Confirmatory factor analysis was conducted for the validity of the scale during the adaptation process, and it was concluded that the scale gave an acceptable level of compliance ($\chi 2/df = 1.83$, CFI = .99, GFI =99, IFI = .99, RMSEA = .05 and SRMR = .03). Within the scope of this research, Cronbach Alpha (α) and McDonald (ω) values were calculated for reliability, with the coefficients coming to .86.

Oxford Happiness Scale - Short Form

The Oxford Happiness Scale developed by Hills and Argyle (2002) was adapted to Turkish by Dogan et al. (2011). Oxford Happiness Scale consists of seven items in total. Internal consistency and test re-test methods were used for the reliability of the scale, and the internal consistency reliability coefficient was determined as .74. The test re-test reliability coefficient was found to be .85. Confirmatory factor analysis was conducted for the validity of the scale during the adaptation process, and it was concluded that the scale gave an acceptable level of compliance ($\chi 2/df = 2.77$, CFI = .97, AGFI =95, NFI = .92, RMSEA = .07 and RMR = .04). Within the scope of this research, Cronbach Alpha (α) and McDonald (ω) values were calculated to determine the level of reliability of the Oxford happiness scale and it was found to be .80 and .79, respectively.

Subjective Vitality Scale

The Subjective Vitality Scale developed by Ryan and Frederick (1997) was adapted to Turkish by Uysal et al., (2014). Subjective Vitality Scale consists of seven items in total. The internal consistency coefficient calculated for its reliability was found to be .84. Confirmatory factor analysis was conducted for the validity of the scale during the adaptation process, and it was concluded that the scale gave an acceptable level of compliance ($\chi 2/df = 1.73$, GFI = .99, AGFI =96, NFI = .99, RMSEA = .05 and SRMR = .03). Within the scope of this research, Cronbach Alpha (α) and McDonald (ω) values were calculated to determine the level of reliability of the subjective vitality scale and both reliability coefficients were found to be .89.

Data Collection

Because of the pandemic COVID -19, we obtained approval from the ethics committee before collecting data online. In this regard, we provided the link we prepared for online data collection via Google Forms and forwarded it to target students via student information systems, email, and applications such as WhatsApp. During the online data collection process, the researchers added an informed consent form link for students to offer their voluntary participation in the research process. As a result, the researchers could complete the online data collection process within 10 days. Since each of the questions presented to the participants within the scope of the research required a valid answer, there was no imperfect data in the research process.

Data Analysis

We applied the two-stage Structural Equation Model (SEM) proposed by Kline (2015) to examine the mediating role of resilience in the relationship between sensation seeking and happiness and subjective vitality. In this context, we tested the measurement model in the first stage. We built the measurement model to test whether the observed variables contributed significantly to other variables (Anderson & Gerbing, 1988; Kline, 2015). We tested the structural model based on the validated theoretical background in the second phase. The X-square ($\chi 2$) ratio to a degree of freedom and GFI, CFI, IFI, SRMR, and RMSEA values were used to evaluate the goodness of fit of the established model. As breakpoints that define the goodness fit; $\chi 2/sd \leq 5$; CFI, GFI, TLI, and IFI $\geq$ .90; RMSEA $\leq$ .08 with SRMR was accepted (Hu & Bentler, 1999; Kline, 2015). Missing data were analyzed using the maximum likelihood (ML) estimator. In the mediation analysis, gender was included as a control variable in the model. Mediation analyses were carried out using AMOS 21.0 after researchers ascertained the arithmetic mean, standard deviation, skewness and kurtosis values, and the relationships between the variables (Table-1).

Results

Descriptive Statistics and Correlation

Table 1 shows the relationships between the variables of sensation seeking, resilience, happiness, and subjective vitality.

Table 1. Descriptive and Relational Consequences of Variables of Sensation Seeking, Resilience, Happiness and Subjective Vitality Variables

Variable	**Correlation**				**Descriptive Statistics**			
	1	2	3	4	M	SD	Skewness	Kurtosis
1. Sensation Seeking	-				9.56	3.40	.224	-.950
2. Resilience	.20**	-			17.76	2.35	-.099	-.199
3. Happiness	.17**	.42**	-		23.45	5.16	-.075	-.533
4. Subjective Vitality	.26**	.47**	.68**	-	31.10	8.62	-.073	-.731

Note. **p < .001

Upon a glance at Table 1, there appears low-level, positively significant relationships between sensation seeking and resilience (*r = .20, p < .001*), subjective vitality *(r = .26, p < .001*), and happiness (*r = .17, p < .001*). In addition, one can see moderate, positively significant relationships between resilience and subjective vitality (*r = .47, p < .001*) and happiness (*r = .42, p < .001*). In addition, the kurtosis and skewness values are between ± 2 criteria for the assumption of normality. This means that all variables have a normal distribution (George & Mallery, 2010).

The Measurement Model

We tested the two-stage structural equation model Kline (2015) proposed for the measurement model. In this context, the measurement model includes four latent variables (sensation seeking, resilience, happiness, and subjective vitality) and 24 observed variables. The results of the measurement model showed good fit values and the model fit indices were acceptable [χ2/sd=3.12; CFI= .90; AGFI= .91; IFI= .91; NFI= .90; TLI= .90; RMSEA=.064 and SRMR= .049]. The parameter estimates for the measurement model are presented in Table 2. After we gained evidence that the measurement model had been validated, we moved on to the mediation analysis phase.

Tablo 2. Parameter Estimates of the Measurement Model

			Unstandardized Estimate		Sstandardized Estimate		
			β	S.E.	β	C.R.	p
ss4	<---	SenS.	1.000		.562		
ss3	<---	SenS	1.204	.104	.693	11.568	***
ss2	<---	SenS	1.472	.116	.830	12.704	***
ss1	<---	SenS	1.497	.117	.856	12.810	***
r1	<---	Res.	1.000		.787		***
r2	<---	Res.	-1.065	.060	-.759	-17.804	
r3	<---	Res.	-1.082	.061	-.761	-17.854	***
r4	<---	Res.	.984	.062	.690	15.934	
r5	<---	Res.	-.897	.060	-.651	-14.921	***
r6	<---	Res.	-1.041	.064	-.704	-16.330	
sv1	<---	SubV.	1.000		.855		***
sv2	<---	SubV.	.839	.052	.637	16.158	***
sv3	<---	SubV.	.841	.049	.665	17.091	***
sv4	<---	SubV.	.989	.043	.815	23.155	***
sv5	<---	SubV.	.957	.053	.695	18.196	
sv6	<---	SubV.	.781	.050	.622	15.628	***
sv7	<---	SubV.	1.171	.042	.913	28.166	***
h1	<---	Happy.	1.000		.529		***
h2	<---	Happy.	1.305	.127	.629	10.298	***
h3	<---	Happy.	1.151	.107	.683	10.797	***
h4	<---	Happy.	.920	.090	.624	10.248	***
h5	<---	Happy.	1.099	.108	.614	10.155	***
h6	<---	Happy.	1.341	.118	.758	11.394	***
h7	<---	Happy.	.577	.097	.303	5.967	***

Note: SenS = Sensation Seeking; Res = Resilience; SubV.= Subjective Vitality; Happy = Happiness.

Structural Model

Gender was included in the structural model as a control variable in the study. First, the model in which resilience is the mediator in the relationship between sensation seeking and happiness and subjective vitality was tested. The results of the mediation model showed good fit values and the model fit indices were acceptable [$\chi 2/sd=3.12$; CFI= .90; AGFI= .91; IFI= .90; NFI= .91; TLI= .92; RMSEA=.073 and SRMR= .055]. Figure 1 shows the path diagram for the mediation model.

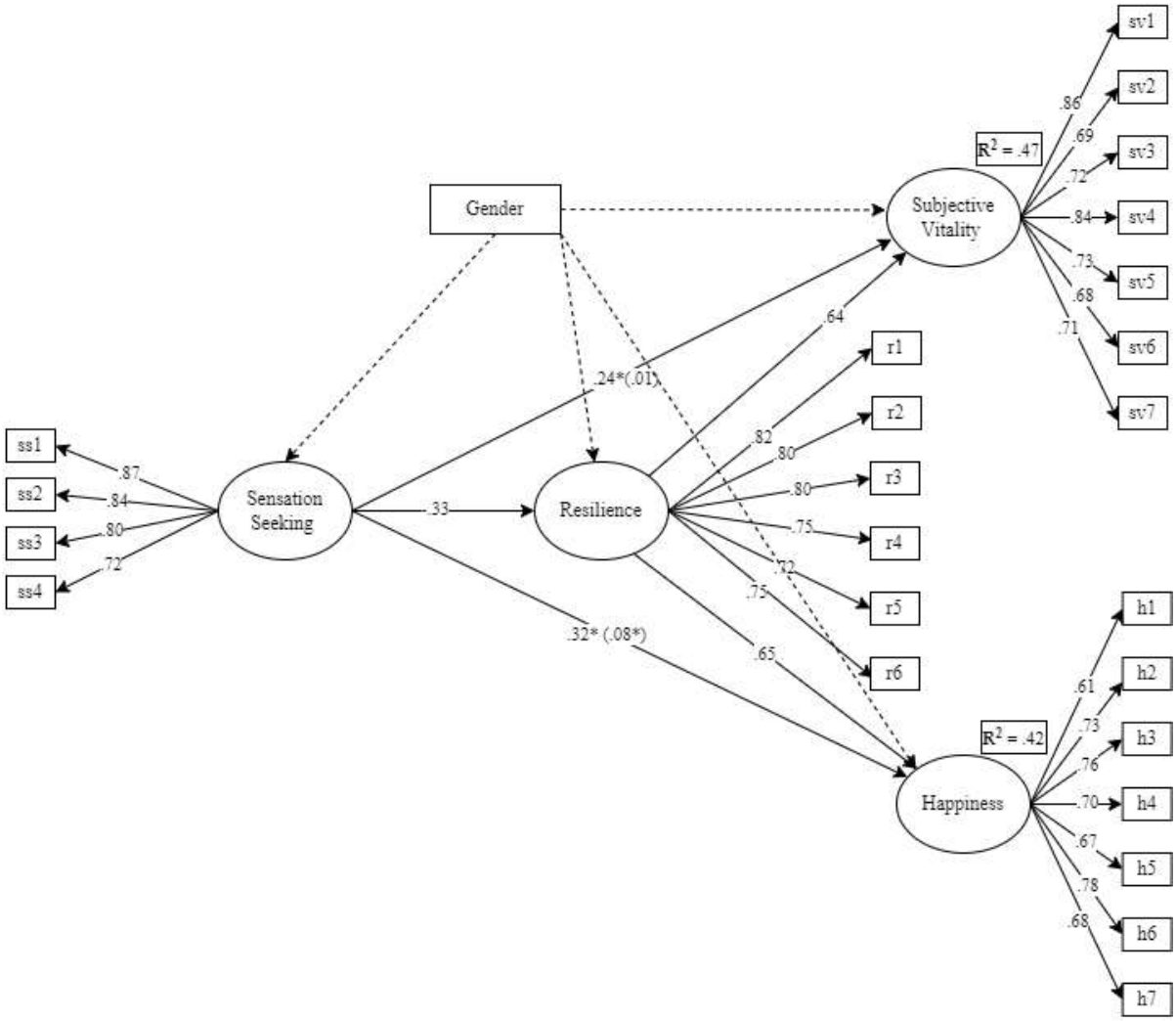


Figure 1. The Mediator Role of Resilience *p<.05

We took account of the suggestions of Baron and Kenny (1986) during the course of statistical procedures for the mediation analysis. We determined the relationship between sensation seeking, happiness, and subjective vitality as the first criterion in this context. We determined the relationship between psychological resilience and sensation seeking and happiness as the second criterion. Finally, we analyzed the mediation by simultaneously including the dependent and independent variables in the model. In this context, we determined that by adding resilience to the model between sensation seeking and happiness, the significant effect of sensation seeking on happiness declined and the β value decreased from .32 to .08. When we added resilience to the model between sensation seeking and subjective vitality, we determined that the significant effect of sensation seeking on happiness declined and the β value decreased from .24 to .01.

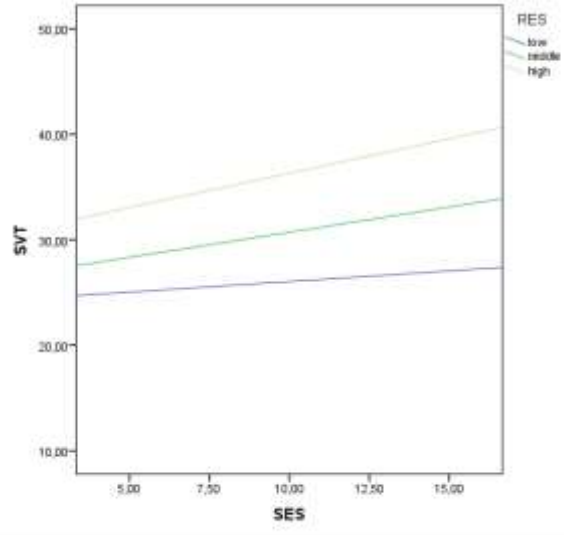
In addition to the structural model in Figure 1, we have given the standardized and unstandardized coefficients between variables in Table 3.

Table 3. Standardized and Unstandardized Coefficients of Model

Variables			Unstandardized Estimate	S.E	C.R (t)	Standardized Estimate	%95 BIAS	
							Lower	Upper
SenS.	⟶	Res.	-.30	.04	-6.58	-.33	-.43	-.23
Res.	⟶	SubV.	-1.01	.07	-12.9	-.65	-.73	-.57
Res.	⟶	Happy.	-.50	.06	-9.02	-.64	-.73	-.54

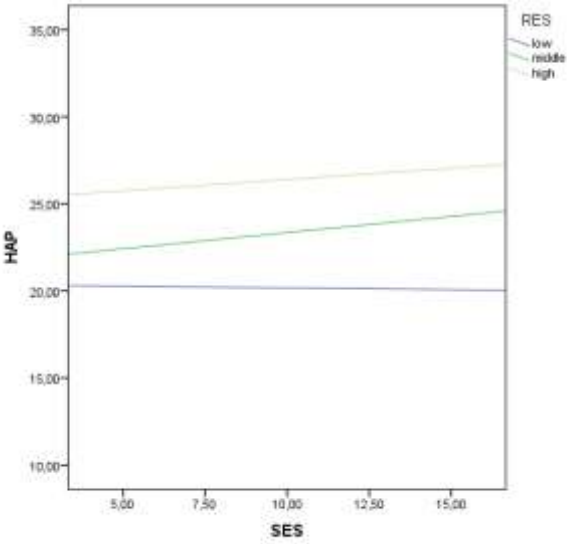
Note: SenS = Sensation Seeking; Res = Resilience; SubV.= Subjective Vitality; Happy = Happiness.

When the direct path coefficients between variables and the confidence intervals for these coefficients were examined, we found that the direct paths established between variables were significant (Table 3). The effect of psychological resilience levels on subjective vitality is shown in figure 2.



Note: SES = Sensation Seeking; RES = Resilience; SVT= Subjective Vitality
Figure 2. The mediating effect of resilience levels on subjective vitality

The effect of psychological resilience levels on happiness is shown in figure 3.



Note: SES = Sensation Seeking; RES = Resilience; HAP= Happiness
Figure 3. The mediating effect of resilience levels on happiness

As shown in Figures 1 and 2, as the level of resilience increases, the predictive power of sensation seeking increases subjective vitality and happiness. In other words, while the relationship between sensation seeking and subjective vitality and happiness is higher in individuals with high resilience, the relationship between sensation seeking and subjective vitality and happiness is lower in individuals with low resilience.

Bootstrapping Process

We used the bootstrapping method to determine the direct and indirect effects of resilience on the relationship between sensation seeking, subjective vitality and happiness. Table 4 contains the results of this analysis.

Table 4. Bootstrapping Process for the Mediator Model

Direct Effect			Estimate	%95 BIAS Lower	%95 BIAS Upper
SenS.	→ Res.		-.33	-.43	-.23
Res.	→ SubV.		-.65	-.73	-.57
Res.	→ Happy.		-.64	-.73	-.54
SenS.	→ SubV.		.30	.20	.39
SenS.	→ Happy.		.22	.12	.33
Indirect Effect					
SenS.	→ Res →	SubV.	.22	.15	.29
SenS.	→ Res →	Happy.	.21	.14	.30

Note: SenS = Sensation Seeking; Res = Resilience; SubV.= Subjective Vitality; Happy = Happiness.

According to the results in Table 4, we can say that resilience has an important role on happiness and subjective vitality.

Discussion

This study examined the mediating effect of resilience in the relationship between sensation seeking, subjective vitality, and happiness among university students. Findings from this study show that sensation seeking and resilience significantly predict subjective vitality and happiness levels in university students. The results provide insights into how resilience affects the relationship between sensation seeking and subjective vitality and happiness.

The research findings show that sensation-seeking predicts subjective vitality and happiness positively. Studies supporting this finding of the study are available in the literature. Furnham and Christoforou (2007) reported that sensation-seeking (looking for success, excitement, adventure, etc.) would predict happiness. Sensation-seeking can be viewed as a personality dimension that motivates individuals to seek new, complex and more intense experiences (Cheung et al., 2017). In this sense, individuals' sensation-seeking behavior can motivate joy, well-being, and vitality. Exciting activities can increase positive emotions, such as individuals' increased energy, enthusiasm and joy. In short, the search for excitement can improve psychological cohesion.

This study shows the indirect effect of sensation-seeking on happiness through resilience. This finding indicates that the effect of resilience on the happiness levels of individuals is more effective than the sensation-seeking variable. In other words, with an increase in psychological resilience, happiness levels may also increase. In line with current literature, the same studies concur that resilience predicts happiness (Benada & Chowdhr, 2017; Fredrickson et al., 2003). Chung et al. (2017) and Altuntas and Genc (2020) revealed that psychological solidity positively predicts happiness, while positive relationships have been discovered in line with resilience and well-being (Sagone & De Caroli, 2014), as well as life satisfaction (Shi et al., 2015) which support the results of this study. Those with high psychological resilience may exhibit high levels of happiness, as they can cope with negative situations (Sood, 2013). According to Yildirim (2019), those with high resilience have a lower fear of happiness. Results in the field thus support the findings of this research. The protective character of psychological resilience can better enable individuals to protect themselves and increase their happiness levels when faced with negative experiences. Individuals with a higher level of resilience are duly more likely to experience fewer mental, social, and physical health problems.

Consistent with another finding of the study, a mediating effect was demonstrated between psychological resilience, sensation seeking, and subjective vitality. The results show that the effect of Sensation Seeking on subjective vitality decreases with resilience. This finding suggests that the effect of resilience on subjective vitality of individuals is more effective than that of the Sensation Seeking variable. In other words, as resilience increases, people's level of subjective vitality may increase.

The results of this study support the findings of other studies that show that resilience predicts subjective vitality (Garg, 2017; Garg & Sarkar, 2020; Kent et al., 2015). The presence of features such as coping strategies (Southwick et al., 2005), positive emotions and optimism (Ong et al., 2006) within the concept of resilience may increase subjective vitality.

Resilience is a protective factor that reduces the risk factors caused by stressful life events and their outcomes (Hu et al., 2015). Therefore, resilience can positively affect subjective vitality's positive, energetic, lively, cheerful,

active, and enthusiastic characteristics (Fini et al., 2010). This can lead to an increased subjective vitality level, with Eksi et al. (2019) finding a negative association between psychological vulnerability and subjective vitality.

Conclusion

The current results indicate the importance of resilience in the relationship between sensation seeking and happiness and subjective vitality. The results of the study show that the effect of resilience is strong on both happiness and subjective vitality. Consistent with the assumptions of Positive Psychology, resilience affects happiness and subjective vitality of individuals. Psychological resilience, which affects the relationship between sensation seeking and subjective vitality and happiness, can positively influence individuals' mental health. Therefore, identifying the role of resilience could be considered key to understanding the psychological relationships underlying subjective vitality and happiness.

Recommendations

The study has a number of limitations. First, although the reliability and validity of the scales used in the research are adequate, the current research findings are based on self-report measures alone. Thus, other evaluation methods (for example, peer and parental report) should be used in later studies. Second, the study design was relational and does not determine a causal relationship. Third, the current research findings can only be generalized around Turkish university students. Therefore, these findings still need to be tested in other populations in the future, such as children, adolescents, and older adults. This study was done by creating an online scale because schools continue to study online, unlike most previous research. A larger sampling can be applied to ensure the reliability and validity of the study results.

Author(s) Contribution Rate

In the study, the subject was determined by AP and KS. The entry of the study was made by AP, and the management by FK. FK made the findings of the article and AP made the discussion.

Conflicts of Interest

There is no conflict of interest between the authors

Ethical Approval (only for necessary papers)

Throughout the research process, research and publication were bore in mind. In this context, carried out within the scope of the permission obtained based on the Ethics Committee of X University Institute of Educational Sciences, Educational Sciences Department. The green light was given on 01/10/2020 and numbered 56785782-050.02.04-E.2000250261.

References

Akin, A., Ümran, A., & Uğur, E. (2016). Mediating role of mindfulness on the associations of friendship quality and subjective vitality. *Psychological Reports, 119*(2) 516-526. https://doi.org/10.1177/0033294116661273

Altuntas, S., & Genc, H. (2020). Resilience as predictor of happiness: Investigation of teacher sample. *Hacettepe University Journal of Education, 35*(4), 936-948. https://doi.org/10.16986/HUJE.2018046021.

Anderson, J.C., & Gerbing, D.W. (1988). Structural equation modeling in practice: A review and recommended two-step approach. *Psychological Bulletin, 103*(3), 411-423. https://doi.org/10.1037/0033-2909.103.3.411

Arnett, J.J. (2000). Emerging adulthood: A theory of development from the late teens through the twenties. *American Psychologist, 55*(5), 469-480. https://doi.org/10.1037/0003-066X.55.5.469

Asgari, N., Yazdkhasti, F., & Nasr Esfahani, M.H. (2016). Investigation of personality traits between infertile women submitted to assisted reproductive technology or surrogacy. *International Journal of Fertility and Sterility, 10*(1), 94-104.

Bachik, M.A.K., Carey, G., & Craighead, W.E. (2020). VIA character strengths among U.S. college students and their associations with happiness, well-being, resiliency, academic success and psychopathology. *The Journal of Positive Psychology*, https://doi.org/10.1080/17439760.2020.1752785

Baron, R.M., & Kenny, D.A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, *51*(6), 1173-1182. https://doi.org/10.1037//0022-3514.51.6.1173

Batmaz, H., & Celik, E. (2021). Examining the online game addiction level in terms of sensation seeking and loneliness in university students. Addicta: *The Turkish Journal on Addictions, 8*(2), 126-130.

Benada, N., & Chowdhr, R. (2017). A correlational study of happiness, resilience and mindfulness among nursing student. *Indian Journal of Positive Psychology, 8*(2), 105-107. https://doi.org/10.15614

Benetti, C., & Kambouropoulos, N. (2006). Affect-regulated indirect effects of trait anxiety and trait resilience on self-esteem. *Personality and Individual Differences*, *41*(2), 341-352. https://doi.org/10.1016/j.paid.2006.01.015

Betancourt, T.S., & Khan, K.T. (2008). The mental health of children affected by armed conflict: Protective processes and pathways to resilience. *International Review of Psychiatry*, *20*(3), 317-328. https://dx.doi.org/10.1080

Brailovskaia, J., Schönfeld, P., Kochetkov, Y., & Margraf, J. (2019). What does migration mean to us? USA and Russia: Relationship between migration, resilience, social support, happiness, life satisfaction, depression, anxiety and stress. *Current Psychology*, *38*, 421-431. https://doi.org/10.1007

Brunstein, J.C., & Maier, G.W. (2002). Das Streben nach persönlichen Zielen: emotionales Wohlbefinden und proaktive Entwicklung über die Lebensspanne [Striving for personal goals: Emotional well-being and proactive development during the lifespan]. In G. Jüttemann & H. Thomae (Eds.), *Persönlichkeit und entwicklung [Personality and development]* (pp. 157-190). Beltz.

Celik, E. (2015). Psychometric properties of brief sensation seeking scale (BSSS-4) in a sample of Turkish adolescents. *Sakarya University Journal of Education*, *5*(3), 42-51. https://doi.org/10.19126/suje.52806

Celik, E**.** (2015). Mediating and moderating role of sensation seeking in the relation between self-concealment and life satisfaction in adolescents, *Education and Science*, *40*(181), 349-361. https://doi.org/10.15390/EB.2015.4436

Celik, E., & Turan, M.E. (2016). A study on the psychometric features of the Turkish version of the brief sensation seeking scale (BSSS-8) for young adults and the relation between sensation seeking and life satisfaction. *IJERE, 1*(1), 29-38. http://dx.doi.org/10.24331/ijere.309959

Celik, E., & Raba, S. (2017). Suppression effect of sensation seeking in the relationship between the proactivity personality and life satisfaction. *Mediterranean Journal of Humanities*, *7*(1), 123-134. http://dx.doi.org/10.13114/MJH.2017.324

Celik, E., Topcuoğlu, P. (2017). Mediating effect of proactive personality on the relationship between subjective vitality and curiosity. *Abant İzzet Baysal University Journal of the Faculty of Education*, *17* (3), 1221-1240.

Celik, E., & Kocak, L. (2018). Suppression effect of sensation seeking on the relationship between general self-efficacy and life satisfaction among emerging adults. *International Journal of Instruction*, *11*(4), 337-352. http://dx.doi.org/10.12973/iji.2018.11422a

Cheung, H.Y., Teo, T., & Hue, M.T. (2017). Modeling the relationships among emotional intelligence, sensation-seeking and risk-taking attitudes of university students in Hong Kong. *Journal of Risk Research*, *20*(5), 569-589, https://dx.doi.org/10.1080/13669877.2015.1100657

Chmitorz, A., Kunzler, A., Helmreich, I., Tüscher, O., Kalisch, R., Kubiak, T., ... & Lieb, K. (2018). Intervention studies to foster resilience-A systematic review and proposal for a resilience framework in future intervention studies. *Clinical Psychology Review*, *59*, 78-100. https://doi.org/10.1016/j.cpr.2017.11.002

Cho, S., & Ryu, E. (2021). The mediating effect of resilience on happiness of advanced lung cancer patients. Supportive care in cancer: official journal of the multinational association of supportive care in cancer. Advance Online Publication. https://doi.org/10.1007/s00520-021-06201-0

Chung, K.E., Lee, N.S., & Park, G.P. (2017). A study on the resilience, self-directed learning ability and happiness indeks of university students. *International Information Institute*, *20*(11), 7887-7894. http://dx.doi.org/10.21742/ajemr.2017.2.1.14

Connor, K.M., & Davidson, J.R. (2003). Development of a new resilience scale: The Connor-Davidson resilience scale (CD-RISC). *Depression and Anxiety*, *18*(2), 76-82. https://doi.org/10.1002/da.10113

Coyne, S.M., Stockdale, L.A., Warburton, W., Gentile, D.A., Yang, C., & Merrill, B.M. (2020). Pathological video game symptoms from adolescence to emerging adulthood: A 6-year longitudinal study of trajectories, predictors, and outcomes. *Developmental Psychology*, *56*(7), 1385-1396. https://doi.org/10.1037/dev0000939

Cuartero, N., & Tur, A.M. (2021). Emotional intelligence, resilience and personality traits neuroticism and extraversion: Predictive capacity in perceived academic efficacy. *Nurse Education Today*, 102, https://doi.org/10.1016/j.nedt.2021.104933

Deci, E.L., & Ryan, R.M. (1985). The general causality orientations scale: Self-determination in personality. *Journal of Research in Personality*, *19*(2), 109-134. https://doi.org/10.1016/0092-6566(85)90023-6

Deci, E.L., & Ryan, R.M. (2008). Self-determination theory: A macrotheory of human motivation, development, and health. *Canadian psychology/Psychologie canadienne*, *49*(3), 182. https://psycnet.apa.org/doi/10.1037/a0012801

Diener, E. (2000). Subjective well-being: The science of happiness and a proposal for a national index. *American Psychologist*, *55*(1), 4-43. https://psycnet.apa.org/doi/10.1037/0003-066X.55.1.34

Dogan, T. (2015). Adaptation of the brief resilience scale into Turkish: A validity and reliability study. *The Journal of Happiness & Well-Being*, *3*(1), 93-102.

Dogan, T., & Akinci-Cotok, N. (2011). Adaptation of the short form of the Oxford happiness questionnaire into Turkish: A validity and reliability study. *Turkish Psychological Counseling and Guidance Journal*, *4*(36), 165-172.

Eksi, H., Ozkapu, D.E., & Ummet, D. (2019). The mediating role of general psychological health in relation between psychological vulnerability and subjective vitality on university students. *Journal of Social Sciences of Mus Alparslan University*, *7*(5), 185-190. http://dx.doi.org/10.18506/anemon.526353

Farahani, M.J., Saiah, A., Heidary, A., & Nabil, M. (2011). The relationship between happiness dimensions and athletic performance in the male high school student in ijrood. *Procedia Social and Behavioral Sciences*. 15, 382 383.

Fini, A.A.S., Kavousian, J., Beigy, A., & Emami, M. (2010). Subjective vitality and its anticipating variables on students. *Procedia-Social and Behavioral Sciences*, *5*, 150-156. https://doi.org/10.1016/j.sbspro.2010.07.064

Fredrickson, B.L., Tugade, M.M., Waugh, C.E., & Larkin, G.R. (2003). What good are positive emotions in crisis? A prospective study of resilience and emotions following the terrorist attacks on the United States on September 11th, 2001. *Journal of Personality and Social Psychology*, *84*(2), 365-376. https://doi.org/10.1037/0022-3514.84.2.365.

Fu, J., Zhao, Y., Feng, X., Wang, Y., Yu, Z., Hua, L., Wang, S., Li, J. (2021). How is fatalistic determinism linked to depression? The mediating role of self-control and resilience. *Personality and Individual Differences*, 180. https://doi.org/10.1016/j.paid.2021.110992

Furnham, A., & Christoforou, I. (2007). Personality traits, emotional intelligence, and multiple happiness. *North American Journal of Psychology*, *9*(3), 439-462.

Garg, N. (2017). Workplace spirituality and employee well-being: An empirical exploration. *Journal of Human Values*, 23(2), 129-147. https://doi.org/10.1177%2F0971685816689741

Garg, N., & Sarkar, A. (2020). Vitality among university students: Exploring the role of gratitude and resilience. *Journal of Organizational Effectiveness: People and Performance*, *7*(3), 321-337. https://doi.org/10.1108/JOEPP-03-2020-0041

George, D., & Mallery, P. (2010). *SPSS for windows step by step: A simple guide and reference 17.0 Update*, Pearson.

Hajloo, N., & Pezeshki, H. (2013). Compare happiness, psychological tenacity, and sensation seeking among athletes and no athletes. *Procedia-Social and Behavioral Sciences*, *84*, 1063-1066. https://doi.org/10.1016/j.sbspro.2013.06.700

Hills, P., & Argyle, M. (2002). The Oxford happiness questionnaire: A compact scale for the measurement of psychological well-being. *Personality and Individual Differences*, *33*(7), 1071-1082. https://doi.org/10.1016/S0191-8869(01)00213-6

Hu, L.T., & Bentler, P.M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*, *6*(1), 1-55. https://doi.org/10.1080/10705519909540118

Hu, T., Zhang, D., & Wang, J. (2015). A meta-analysis of the trait resilience and mental health. *Personality and Individual Differences*, *76*, 18-27. https://doi.org/10.1016/j.paid.2014.11.039

Kaya, M., Sahranc, Ü., & Celik, E. (2019). Sensation seeking, self-conceal-ment as predictors of adolescents' attitude toward violence in early adolescence. *OPUS-International Journal of Society Researches, 10(17*), 1664-1684. https://doi.org/10.26466/opus.536076

Kasikci, F. (2020). The mediating role of personality traits in the correlation between adjustment to university life and well-being. *Turkish Studies-Education*, *15*(5), 3445-3466. https://dx.doi.org/10.47423/TurkishStudies.43683

Kent, M., Rivers, C.T., & Wrenn, G. (2015). Goal-Directed Resilience in Training (GRIT): A biopsychosocial model of self-regulation, executive functions, and personal growth (eudaimonia) in evocative contexts of PTSD, obesity, and chronic pain. *Behavioral Sciences*, *5*(2), 264-304. https://doi.org/10.3390/bs5020264

Klinar, P., Burnik, S., & Kajtna, T. (2017). Personality and sensation seeking in high-risk sports. *Acta Gymnica*, *47*(1), 41-48. https://doi.org/10.5507/ag.2017.005

Kline, R.B. (2015). *Principles and practice of structural equation modeling*. Guilford Press.

Lee, Y.H., Adrew, K., Richards, R., & Washburn, N. (2021). Mindfulness, resilience, emotional exhaustion, and turnover intention in secondary physical education teaching, *European Review of Applied Psychology*, 71, https://doi.org/10.1016/j.erap.2021.100625

Lü, W., Wang, Z., Liu, Y., & Zhang, H. (2014). Resilience as a mediator between extraversion, neuroticism and happiness, PA and NA. *Personality and Individual Differences*, *63*, 128-133. https://doi.org/10.1016/j.paid.2014.01.015

Lyubomirsky, S., Sheldon, K. M., & Schkade, D. (2005). Pursuing happiness: The architecture of sustainable change. *Review of General Psychology*, *9*(2), 111-131. https://doi.org/10.1037/1089-2680.9.2.111

Ma, C.M.S. (2018). A latent profile analysis of internet use and ıts association with psychological well-being outcomes among Hong Kong Chinese early adolescents. *Applied Research Quality Life*, *13*, 727-743. https://doi.org/10.1007/s11482-017-9555-2

Mak, W. W., Ng, I. S., & Wong, C. C. (2011). Resilience: enhancing well-being through the positive cognitive triad. *Journal of Counseling Psychology*, *58*(4), 610. https://psycnet.apa.org/doi/10.1037/a0025195

Martin-Cuellar, A., Lardier Jr, D.T., & Atencio, D.J. (2019). Therapist mindfulness and subjective vitality: The role of psychological wellbeing and compassion satisfaction. *Journal of Mental Health*, 1-8. https://doi.org/10.1080/09638237.2019.1644491

Masten, A.S., Obradović, J., & Burt, K.B. (2006). *Resilience in Emerging Adulthood: Developmental Perspectives on Continuity and Transformation.* In J. J. Arnett & J. L. Tanner (Eds.), *Emerging adults in America: Coming of age in the 21st century* (p. 173-190). *American Psychological Association*. https://doi/10.1037/11381-007

Naglieri, J.A., LeBuffe, P.A., & Ross, K.M. (2013). Measuring resilience in children: From theory to practice. In *Handbook of resilience in children* (pp. 241-259). Springer.

Neshat, D.H., Kalantari, M., Mehrabi, H. et al. (2009). Determination of effective factors in happiness of Mobarakeh steel company. *Applied Sociology*. 1, 105-118.

Ong, A.D., Bergeman, C.S., Bisconti, T.L., & Wallace, K.A. (2006). Psychological resilience, positive emotions, and successful adaptation to stress in laterlife. *Journal of Personality and Social Psychology*, *91*(4), 730-749. https://doi.org/10.1037/0022-3514.91.4.730

Penninx, B.W., Guralnik, J.M., Bandeen-Roche, K., Kasper, J.D., Simonsick, E.M., Ferrucci, L., & Fried, L.P. (2000). The protective effect of emotional vitality on adverse health outcomes in disabled older women. *Journal of the American Geriatrics Society*, *48*(11), 1359-1366. https://doi.org/10.1111/j.1532-5415.2000.tb02622.x

Pourkord, M., Mirderikvand, F., & Karami, A. (2020). Predicting resilience in students based on happiness, attachment style, and religious attitude. *Health Spiritual and Medical Ethics, 7*(2), 27-34. https://doi.org/10.29252/jhsme.7.2.27

Ravert, R.D., & Donnellan, M.B. (2020). Impulsivity and sensation seeking: Differing associations with psychological well-being. *Applied Research in Quality of Life*, https://doi.org/10.1007/s11482-020-09829-y

Renfro, A.G., Antoine, K., & Lawson, A.L. (2013). Sensation seeking influences on memory of positive events. *North American Journal of Psychology*, *15*(3), 609-622.

Reis, E., Arriaga, P., Lima, M-L., Teixeira, L., Postolache, O., Postolache, G. (2020). Tailoring virtual environments of an exergame for physiotherapy: the role of positive distractions and sensation-seeking. PsyEcology: *Bilingual Journal of Environmental Psychology/Revista Bilingüe de Psicología Ambiental, 11*(1), 49-63. https://doi.org/10.1080/21711976.2019.1643989

Rutter, M. (2006). Implications of resilience concepts for scientific understanding. *Annals of the New York Academy of Sciences*, *1094*(1), 1-12. https://doi.org/10.1196/annals.1376.002

Ryan, R.M., & Frederick, C. (1997). On energy, personality, and health: Subjective vitality as a dynamic reflection of well-being. *Journal of Personality*, *65*(3), 529-565. https://doi.org/10.1111/j.1467-6494.1997.tb00326.x

Sagone, E., & De Caroli, M.E. (2014). Relationships between psychological well-being and resilience in middle and late adolescents. *Procedia: Social and Behavioral Sciences, 141*, 881-887. https://doi.org/10.1016/j.sbspro.2014.05.154.

Sagone, E., De Caroli, M.E., Falanga, R., & Indiana, M.L. (2020). Resilience and perceived self-efficacy in life skills from early to late adolescence. *International Journal of Adolescence and Youth*, *25*(1), 882-890. https://doi.org/10.1080/02673843.2020.1771599

Salama-Younes, M. (2011). Positive mental health, subjective vitality and satisfaction with life for French physical education students. *World Journal of Sport Sciences*, *4*(2), 90-97.

Schwarzer, R., & Warner, L. M. (2013). Perceived self-efficacy and its relationship to resilience. In *Resilience in children, adolescents, and adults* (pp. 139-150). Springer.

Seligman, M.E. (2011). *Flourish: A visionary new understanding of happiness and wellbeing*. Free.

Seligman, M.E., Steen, T.A., Park, N., & Peterson, C. (2005). Positive psychology progress: empirical validation of interventions. *American Psychologist*, *60*(5), 410-421. https://doi.org/10.1037/0003-066x.60.5.410

Shi, M., Wang, X., Bian, Y., & Wang, L. (2015). The mediating role of resilience in the relationship between stress and life satisfaction among Chinese medical students: A cross-sectional study. *BMC Medical Education*, *15*(16), 2-7. https://doi.org/10.1186/s12909-015-0297-2

Smith, B.W., Dalen, J., Wiggins, K., Tooley, E., Christopher, P., & Jennifer Bernard, J. (2008). The brief resilience scale: Assessing the ability to bounce back. *International Journal of Behavioral Medicine*, *15*, 194-200. https://doi.org/10.1080/10705500802222972

Sood, S. (2013). Happiness as mediator between resiliency and mental health in university students. *Indian Journal of Health and Welbeing*, *4*(2), 252-255.

Southwick, S.M., Vythilingam, M., & Charney, D.S. (2005). The psychobiology of depression and resilience to stress: Implications for prevention and treatment. *Annual Review of Clinical Psychology*, 1, 255-291. https://doi.org/10.1146/annurev.clinpsy.1.102803.143948

Stephenson, M.T., & Southwell, B.G. (2006). Sensation seeking, the activation model, and mass media health campaigns: Current findings and future directions for cancer communication. *Journal of Communication*, *56*(suppl_1), S38-S56. https://doi.org/10.1111/j.1460-2466.2006.00282.x

Stephenson, M.T., Hoyle, R.H., Palmgreen, P., & Slater, M.D. (2003). Brief measures of sensation seeking for screening and large-scale surveys. *Drug and Alcohol Dependence*, *72*(3), 279-286. https://doi.org/10.1016/j.drugalcdep.2003.08.003

Sulejmanov, F., Spasovski, O., & Platt, T. (2018). The development of the humor structure appreciation scale and its relation to sensation seeking inventory and need for closure scale. *The European Journal of Humour Research*, *6*(1), 124-140. http://dx.doi.org/10.7592/EJHR2018.6.1.sulejmanov

Tristán, J., Ríos-Escobedo, R. M., López-Walle, J. M., Zamarripa, J., Narváez, M. A., & Alvarez, O. (2021). Coaches' corrective feedback, psychological needs, and subjective vitality in Mexican soccer players. *Frontiers in Psychology*, 4082. https://doi.org/10.3389/fpsyg.2020.631586

Ugur, E., Kaya, Ç., & Ozcelik, B. (2019). Subjective vitality mediates the relationship between respect toward partner and subjective happiness on teachers. *Universal Journal of Educational Research, 7*(1), 126-132. https://doi.org/10.13189/ujer.2019.070117

Ungar, M. (2012). Social ecologies and their contribution to resilience. In *The social ecology of resilience* (pp. 13-31). Springer.

Uysal, R., Saricam, H., & Akin, A. (2014). The psychometric properties of Turkish version of subjective vitality scale. *Journal of Social Sciences Institute of Mugla University, 33*, 136-146. http://www.sobbiad.mu.edu.tr/index.php/asd/article/view/466

Van Rens, F.E.C.A., & Heritage, B. (2020). Mental health of circus artists: Psychological resilience, circus factors, and demographics predict depression, anxiety, stress, and flourishing, *Psychology of Sport & Exercise* 53, https://doi.org/10.1016/j.psychsport.2020.101850

Vries, L.P., Baselmans, B.M.L., Luykx, J.J., Zeeuw, E.L., Minic˘a, C.C., Geus, E.J.C., Vinkers, C.H., Bartels, M. (2021). Genetic evidence for a large overlap and potential bidirectional causal effects between resilience and well-being. *Neurobiology of Stress*, 14. https://doi.org/10.1016/j.ynstr.2021.100315

Yildirim, M. (2019). Mediating role of resilience in the relationships between fear of happiness and affect balance, satisfaction with life, and flourishing. *Europe's Journal of Psychology, 15*(2), 183-198, https://doi.org/10.5964/ejop.v15i2.1640.

Zuckerman, M. (2007). The sensation seeking scale V (SSS-V): Still reliable and valid. *Personality and Individual Differences, 43*(5), 1303-1305. https://doi.org/10.1016/j.paid.2007.03.021

Zuckerman, M., & Kuhlman, D.M. (2000). Personality and risk-taking: Common bisocial factors. *Journal of Personality, 68*(6), 999-1029. https://doi.org/10.1111/1467-6494.00124

International Journal of Contemporary Educational Research (IJCER)

www.ijcer.net

The Effect of Philosophy for Children (P4C) Curriculum on Critical Thinking through Philosophical Inquiry and Problem Solving Skills

Sema IŞIKLAR [1], Yasemin ABALI ÖZTÜRK [2]
[1] Republic of Turkey Ministry of National Education,
0000-0002-4445-1933
[2]Canakkale Onsekiz Mart University,
0000-0003-1961-0557

Article History
Received: 25.05.2021
Received in revised form: 27.01.2022
Accepted: 10.02.2022
Article Type: Research Article

To cite this article:

Işıklar, S., & Abalı-Öztürk, Y. (2022). The effect of philosophy for children (P4C) curriculum on critical thinking through philosophical inquiry and problem solving skills. *International Journal of Contemporary Educational Research*, *9*(1), 130-142. https://doi.org/10.33200/ijcer.942575

International Journal of Contemporary Educational Research
Volume 9, Number 1, March 2022, 130-142 ISSN: 2148-3868

The Effect of Philosophy for Children (P4C) Curriculum on Critical Thinking through Philosophical Inquiry and Problem Solving Skills*

Sema Işiklar[1], Yasemin Abali Öztürk[2]**
[1]Ministry of National Education
[2]Çanakkale Onsekiz Mart University

Abstract

This study aims to examine the effect of the P4C curriculum on 5-6-year-old children's critical thinking through philosophical inquiry and their problem-solving skills. The study group included a total of 40 children learning in kindergartens at an elementary school in Çanakkale, Turkey. The study used a quasi-experimental model with the pretest-posttest control group. The "Philosophy for Children Curriculum" prepared by interviewing two experts was administered to the children in the experimental group for ten weeks in two sessions per week with an average total duration of 40 minutes. The study deployed the "Critical Thinking Scale through Philosophical Inquiry for Children 5-6 Years Old" and "Problem Solving Skills Scale for Children (PSSS)" as data collection tools. The analysis results showed a significant difference between the pretest and postscores of both groups in terms of the experimental groups' critical thinking skills through philosophical inquiry within-group comparisons. Although the posttest mean score of the experimental group's critical thinking skills through philosophical inquiry was higher than the control group, no statistically significant difference was observed between them. Considering the comparisons of problem solving skills within groups, a significant difference was determined between both groups' pretest and posttest scores. When the problem solving skills were compared between groups post-test results, a significant difference was noted in favor of the experimental group.

Keywords: Philosophy for children (P4C), Philosophy for children curriculum, Critical thinking through philosophical inquiry, Problem solving

Introduction

In recent years, reports on the results of exams (e.g., Pisa exam) that measure high-level skills have found that students have difficulty interpreting and evaluating the information they have learned in various areas such as science and mathematics (Aydın, Selvitopu & Kaya, 2018). Students have difficulty mastering sophisticated thinking skills such as critical thinking and problem solving (ERG, 2008). Contrary to the traditional understanding of education, John Dewey advocated the significance of education systems that teach students "how" to think rather than "what" to think. In other words, an education based on thinking gains prominence in contrast to rote learning based education (Williams, 2017). Many researchers (Akkocaoğlu Çayır, 2015b; Kefeli & Kara, 2008; Lone, 2015; Matthews, 2005; Millett & Tapper, 2012; Mutlu, 2010; Taş, 2017) are of the view that education becomes more efficient when it is conducted through thinking and questioning. Therefore, thinking education approaches that will develop children's thinking and questioning skills have become more and more remarkable over time.

Due to the rapid changes in all areas of life in democratic societies, it is increasingly paramount for the individual to develop thinking skills such as critical thinking and problem solving for better and more effective thinking (Dalğar, 2017). Today's education systems have begun to be restructured to develop critical, creative and problem-solving thinking skills. Studies have been carried out in this direction in Turkey, and curricula have been revised based on learner-centered approaches (TMoNE, 2013; Taş, 2017). The Preschool Curriculum

* The study is part of master thesis entitled "The Effect of Philosophy for Children Education Program on 5-6 Year-Old Children's Critical Thinking through Philosophical Inquiry and Problem-Solving Skills" by first author conducted in supervisor of second author.

**Corresponding Author: *Yasemin Abalı Öztürk, yaseminzeren1979@gmail.*

published by the Turkish Ministry of National Education (2013) emphasizes the importance of developing thinking skills, learning by discovering, being active in the child's learning process, adapting what they learn to different situations, and problem solving skills. Meanwhile, the curriculum is rested on asking questions about the child's subjects, researching and exploring.

The report titled "21st Century Student Profile" by Ministry of National Education (2011) in Turkey indicated the significance of 21st century thinking skills such as critical, creative, innovative, problem solving and decision making. Acquiring such skills and turning them into character requires many years of hard work. Therefore, it is important to develop critical thinking in the first years of life (Dalğar, 2017). A key component of critical thinking is the ability to evaluate other people's statements. Since information obtained from others is not always accurate, it is important for children to reason about it critically.

By as early as age 3, children understand that people sometimes give inaccurate information and that some individuals are more reliable sources than others (Heyman, 2008). According to UNESCO (2007), preschool and primary school ages are decisive years when children acquire creative and critical thinking skills. Children learn to produce creative solutions, establish cause-effect relationships and predict their consequences during the problem solving process (Kınık, 2018). Because problem-solving skills enable individuals to overcome their problems, the earlier they are introduced to children, the easier they will be able to adapt to daily life. Kant (2006) noted that it is important for children to learn to think. More emphasis should be placed on "how" children should think rather than "what" they think to develop their thinking skills. Various educational approaches are put into practice to improve children's thinking skills. The "Philosophy for Children" (P4C) approach is considered as one of those that adopts the principle of "Learning to Think" on how children should think and how they can develop their thinking processes (Boyraz & Türkcan, 2017; Durmuş, 2008). Preschool period is a critical period in human life. Therefore, it is indispensable for children to be able to think critically and solve problems as well as receiving education. In this context, the problem statement of this study was determined as "What is the effect of the Philosophy for Children Curriculum on 5-6 year-old children's critical thinking and their problem-solving skills through philosophical inquiry?".

Philosophy for Children (P4C)

"Child philosophy" was first used as a concept in the philosophical literature by Karl Jaspers, and it was created with the combination of the words "child" and "philosophy". Those who defended that philosophy is questioned with children used the term "Philosophy with Children-PwC" (Mutlu, 2010). Lipman preferred to call it "Philosophy For Children-P4C".

Although the philosophy for children approach is close to the pragmatic philosophy of George Herbert Mead, Charles Sanders Peirce, Lev Vygotsky and Justus Buchler as its main framework, its foundations are based on John Dewey's student-centered understanding and pragmatic philosophy which asserts that thinking skills should be strengthened as early as possible. John Dewey's views such as encouraging children to think and talk about what, why and how they will do it, children becoming active in the classroom, and the value of what children produce gave direction to the Philosophy for Children approach (Okur, 2008). However, Lipman and Sharp, the founders of the philosophy for children approach, did not see their curricula as completely pragmatist (Erdoğan 2018; Juuso, 2007; Lipman, 1996; Tümkaya & Gülaçtı, 2010; Valitalo, 2018; Vansieleghem & Kennedy, 2011).

P4C education enables children to develop and justify their thinking capacity, reasoning, critical thinking and discussion skills through philosophical dialogue. The desire for P4C education movement in the USA for the first time began with the work of Matthew Lipman (Funston, 2017). What is meant by the philosophy education here is not to convey the views of the philosophers, but an understanding of philosophy peculiar to children, which urges them to think critically and tophilosophers' views, but an understanding of philosophy peculiar to children, which urges them to think critically and reason. P4C education is a way of thinking or questioning that deals with all kinds of issues, questions and concepts in philosophy and is therefore relevant to all disciplines. Therefore, it can be applied in lessons from all areas. Children's literature is closely linked to reading and language skills, as it uses a text, story or a novel appropriate for children as a tool while questioning. P4C education is applied in many countries around the world (Akkocaoğlu Çayır, 2015b; Boyacı, Karadağ & Gülenç, 2018; Erdoğan, 2018; Imany, Ahghar & Seif Naraghi, 2016; Karadağ & Yıldız Demirtaş, 2018).

Philosophy for Children Curriculum (P4CC)

It refers to a thinking education curriculum introduced by Matthew Lipman and Ann Sharp in the 1970s and adopts the "Learning to Think" principle. P4CC aims for children to learn by asking questions, questioning and discussing in dialogues. Children are generally expected to ask questions to be discussed. As a result, active children in this process learn to think better and ask better questions (Taş, 2017). At the same time, P4CC contributes children's critical thinking, problem solving, asking questions, listening, cause and effect skills, and thinking skills about concepts that are important to them, curiosity and desire to explore. Children can develop different perspectives and think more flexibly and effectively.

P4CC attempts to make philosophical inquiry with children under adults' guidance and discuss philosophical concepts such as happiness, love, right, wrong, injustice, and fairness through their daily life experiences or stories. Children define these concepts with reasoning related to the questions, and they try to make connections between their daily lives. This process is closely related to thinking skills (Akkocaoğlu Çayır, 2015b). In general, P4CC sessions start with sharing a short story, poem, picture, object, or some other stimulus by the teacher, and the children then take time to think of their questions. Therefore, various materials regarding different Philosophy for Children methods have evolved over time, and stimulants have been enriched and started to be used (Trickey & Topping, 2004). Lone (2015) stated various questions that can help in philosophical conversations: “What did you mean when you say …”, “What is the meaning of …?”, “When you say … do you want to say…? ”,“ What are the things that make you say that? ”.

Philosophy practices for children vary across the cultural structures and perspectives of countries on education, which paves the way for developing new methods related to the approach (Erdoğan, 2018). Each method has similar aspects and significant differences. For instance, Lipman's method is mostly applied to children and young people, the Socratic method to adults, and the Philosophical Inquiry Society method to adults and children (Boyacı, Karadağ & Gülenç, 2018).

The philosophical inquiry society (PIS) method that was used in this research was developed by Catherine McCall after the studies with Matthew Lipman. The aim of this method is to transform the children of any group that knows or does not know each other into a "Philosophical Inquiry Society" as a result of their philosophical dialogue. In PIS sessions, the chairperson should have a basic knowledge of philosophy and logic. Their task is to seek different dynamics and provide different conditions for the emergence of philosophical dialogue. The chairperson must ensure that the discussion continues in a philosophical line, to create a chance for every child to participate and to warrant different opinions (Boyacı, Karadağ & Gülenç, 2018).

Lipman regarded philosophy as a fun activity in which ideas are increasingly enhanced and grounded on each other. He called the philosophy session as "the community of inquiry" (Juuso, 2007). The community of inquiry is a group convened through a dialogue-based investigation to examine a topic or theme of common interest. The most important point is that this community generates knowledge. Its foundations are based on the concept of collaborative knowledge creation and Peirce, Dewey and Lipman (Dumitru, 2012).

The relevant literature showed a limited number of studies conducted in Turkey regarding the Philosophy for Children (Akkocaoğlu Çayır, 2015a; Aydın Yardım, 2005; Erdoğan, 2018; Okur, 2008; Taş, 2017). Only two of them were carried out with preschoolers. Okur (2008) prepared a training program for the approach and examined the effect of this program on preschoolers in terms of several variables. Taş (2017) attempted to identify the impact of the curriculum prepared in line with the approach upon preschoolers’ theory of mind and creativity.

This study is paramount in terms of drawing attention to the "Philosophy for Children" approach, which is a lesser-known approach in Turkey, and that young children can make philosophy at an early age. Besides, the study is expected to contribute to the related literatureby examining the effect of Philosophy for Children on preschoolers’ thinking skills such as critical thinking and problem solving through philosophical inquiry.

Aim of the Study

This study aims to examine the effect of P4CC on 5-6-year-old children’s critical thinking through philosophical inquiry and their problem-solving skills and contribute to the field in this regard and shed light on further studies. In service of this aim, answers to the following sub-problems were sought:

1. Is there a significant difference between the critical thinking skills through philosophical inquiry pretest and posttest scores of the children in the experimental and control groups?

2. Is there a significant difference between the children in the experimental group's critical thinking through philosophical inquiry pretest and posttest scores?
3. Is there a significant difference between the children in the control group's critical thinking through philosophical inquiry pretest and posttest scores?
4. Is there a significant difference between the problem-solving pretest and posttest scores of the children in the experimental and control groups?
5. Is there a significant difference between the children in the experimental group's problem-solving pretest and posttest scores?
6. Is there a significant difference between the children in the control group's problem-solving pretest and posttest scores?

Method

This study aims to examine the effect of P4CC on 5-6-year-old children's critical thinking skills through philosophical inquiry and their problem-solving skills. Since the experimental and control groups would be compared before and after the implementation, the study used a quasi-experimental model with the pretest-posttest control group, one of the quantitative research designs. Table 1 depicts the study design and measurement tools.

Table 1. Experimental Design Used in the Study

Group	Pretest	Process	Posttest
Experimental	CTSPI & PSSS	Philosophy for Children Curriculum	CTSPI & PSSS
Control	CTSPI & PSSS		CTSPI & PSSS

The purpose of experimental research is to create an environment in which the researcher can distinguish a certain variable by controlling all other variables to show what the effect of a specific approach or intervention is and the cause-effect relationship between variables (Büyüköztürk, 2016; Johnson, 2015).

The study's dependent variable was 5-6 year-old children's critical thinking through philosophical inquiry and their problem solving skills, and the independent variable was the "Philosophy for Children Curriculum". P4CC was administered to the children in the experimental group for 10 weeks, and no intervention was made in the control group. P4C curriculum practices were carried out in the experimental group by the researchers. The control group continued their standard curriculum with their own teacher.

Study Group

The study group composed of 60-72 months (5-6-year-old) and the mean of the months is 65.4 months 40 children. The children who are in the study group are studying in kindergartens of a primary school in Çanakkale in the 2018-2019 academic year and have similar socio-economic status. There were 20 children in the experimental group and 20 children in the control group. The children in the study group are in the range of 60-72 months, and the mean of the months is 65.4 months.

Considering the demographic characteristics of the experimental and control groups; 25% (n=5) of the students in the experimental group were female, and 75% (n=15) were males, while 40% (n=8) of the students in the control group were female, and 60% (n=12) were males. 30% (n=6) of the mothers of the experimental group graduated from primary school, 35% (n=7) secondary school, 15% (n=3) high school and 20% (n= 4) university graduates, while %45 (n = 9) of the mothers in control group were primary school graduates, 25% (n=5) were secondary school graduates, 25% (n=5) were high school graduates and 5% (n=1) were university graduates. Upon examining the educational status of the experimental group students' fathers; 35% (n=5) were identified to be primary school graduates, 35% (n=7) were secondary school, 20% (n=4) were high school graduates and 20% (n=4) were university graduates; whereas, 40% (n = 8) of the fathers of the control group students were primary school graduates, 15% (n=3) were secondary school, 40% (n=8) were high school and 5% (n=1) were university graduates.

While 85% (n=17) of the mothers of those in the experimental group do not work, 5% (n=1) work in the public sector and 10% (n=2) in the private sector. 80% (n=16) of the mothers of the control group do not work, 5% (n

=1) work in the public sector, and 15% (n=3) in the private sector. While 15% (n=3) of the fathers of those in the experimental group work in the public sector and 85% (n=17) in the private sector, while 15% (n=3) of the fathers of the control group were in the public sector and 85% (n=17) works in the private sector. While the families of 90% (n = 18) of the experimental group students live together, the families of 10% (n=2) are separate. On the other hand, 95% of the families of the control group (n=19) live together, and 5% (n = 1) are divorced.

Data Collection Tools

This study deployed a "Personal Information Form" to obtain demographic information regarding children and their families. To measure the effectiveness of the developed curriculum, "Critical Thinking Scale through Philosophical Inquiry for Children 5-6 Years Old (CTSPI)" developed by Karadağ, Yıldız Demirtaş and Yıldız (2017) and "Problem Solving Skills Scale for Children (PSSS)" developed by Oğuz and Köksal Akyol (2015) were used as pretest and post-test.

Critical thinking scale through philosophical inquiry for children 5-6 years old (CTSPI): Being a 5-point Likert type ("Never", "Sometimes", "Rarely", "Often" and "Always"), the scale consisted of three sub-factors (Philosophical Inquiry, Language and Cognitive Skills and Formulating Question) and 38 items. Karadağ, Yıldız Demirtaş and Yıldız (2017) examined the implicit structure of the scale through exploratory factor analysis and model fit with confirmatory factor analysis to ensure the construct validity of the scale. The internal consistency coefficients of the scale were noted to be high (.974, .955, .983, .986).

Problem solving skills scale for children (PSSS): The "Problem Solving Skills Scale for Children (PSSS)" developed by Oğuz and Köksal Akyol (2015) was measured on five-point Likert-type (0: No solution, 1: A single solution, 2: Two solutions, 3: Three solutions, 4 : More than three solutions). The tool included eighteen problem statements, drawings relevant to these problem statements and evaluation form. The developers of the scale examined content Validity Index and Explanatory Factor Analysis for validity studies, and the content validity index was calculated as 0.99. The appropriateness level of drawings was determined as 0.96. As for reliability studies, Cronbach Alpha Internal Reliability Coefficient was identified as .86, and the correlation coefficient after the test-retest was found to be .60. The validity and reliability analyses revealed that the scale is appropriate for children aged 60 to 72 months.

Philosophy for children curriculum: While preparing the Philosophy for Children Curriculum, similar curricula were initially examined in the relevant literature. The researcher participated in the Philosophy for Children and Communities (P4C) Specialization Certificate Program and had the competence to practice Philosophy for Children educational practices. After the training and the research, activity plans consisting of storybooks and videos with the theme of philosophical inquiry that can be used in pre-school education were prepared. They were submitted to experts for their opinions, the shortcomings were eliminated, and a 10-week P4CC was formed within this framework. The learning outcomes and indicators overlapping with the Turkish Ministry of National Education Preschool Curriculum were determined while preparing P4CC activity plans. Large group Turkish-language activities were organized in line with the learning outcomes related to the Philosophy for Children Curriculum within the context of the cognitive domain in the Pre-School Curriculum as "Establishes cause-effect relationships.", "Produces solutions to problems."Expresses what they listen/watch in various ways."; Social-emotional development learning outcomes such as "Explains others' feelings about an event or situation," "Shows positive/negative feelings about an event or situation in appropriate ways," "Respects differences," "Feels safe". Concepts such as "Right to Life," "Friendship," "Sharing," "Tolerance," "Selfishness," "Patience," "Anger," "Injustice," and "Justice" were discussed using various books and videos for a total of 20 sessions. Some examples of the questions asked during the philosophical explorations with the children are as follows: "What does it take to be friends with someone?", "What does friendship mean to you?", "Should we be friends with someone just like us?", "Do we have to be the same to be friends?" , "What does patience mean?", "Is it always a good thing to be patient?", "Should we be patient in every situation?" . The teacher helped children sit in a circle to actively participate and see each other. After a short conversation, the teacher created a warm conversation environment by showing the book and asking them to guess what it was about by looking at the picture on its cover. Afterwards, the book was read, the children's own ideas and feelings were discussed, and the evaluation was made under the teacher's guidance.

Data Collection

Prior to administering the P4CC and pretests, necessary permissions were obtained from Turkey Çanakkale Provincial Directorate of National Education, the families of the children and the scale developers. The families

of the children filled the personal information form. The practitioner, that is the researcher, individually administered the PSSS pretests to each child in the experimental and control groups in a quiet environment. Those who did not want to complete or fill the test were excluded from the working group. The tests lasted approximately 20 minutes. CTSPI pretests were filled with the support of the researcher and the control group teacher. After the pretest applications, "Philosophy for Children Curriculum" was administered to the experimental group for ten weeks, two sessions per week, for a total of 20 sessions lasting nearly 40 minutes, and then post-tests were carried out in the same way.

Data Analysis

Statistical analyzes were performed through the use of the SPSS package program. At first, normality tests were conducted to determine whether the data showed normal distribution. Shapiro-Wilk, Skewness-Kurtosis values were examined, and the coefficients of variation were calculated to determine whether the data were appropriate for using parametric methods.

Table 2. The Shapiro-Wilk Test Results of the CTSPI and PSSS

	Group	Statistics Value	df	p
CTSPI	Experimental	.958	20	.504
	Control	.963	20	.595
PSSS	Experimental	.952	20	.403
	Control	.906	20	.052

Table 2 displays that the data obtained from the experimental and control groups regarding CTSPI and PSSS showed a normal distribution ($p>.05$).

Table 3. The Skewness and Kurtosis Values of the CTSPI and PSSS

	Group	N	Skewness	Kurtosis
CTSPI	Experimental	20	-.152	-.946
	Control	20	-.077	-.814
PSSS	Experimental	20	.173	-.810
	Control	20	-.959	.257

Upon analyzing Table 3, the data demonstrated a normal distribution, since kurtosis and skewness values obtained from the overall scales and its dimensions were between (+2.0) and (-2.0) (George & Mallery, 2010).

Table 4. Coefficient of Variation Results of the CTSPI and PSSS

	Group	Variation Coefficient
CTSPI	Experimental	%26
	Control	%23
	Experimental	%17
PSSS	Control	%22

The coefficient of variation was calculated as a result of dividing the standard deviation value by the arithmetic mean and expressing the obtained value in percentile. The results are depicted in Table 4. In cases when the coefficient of variation is below 50%, the distribution is accepted as normal (Bahar, Nartgün, Durmuş & Bıçak, 2008). Considering the results related to Shapiro-Wilk, Skewness-Kurtosis and variation coefficient, the data regarding CTSPI and PSSS were determined to show normal distribution. Histogram distributions also demonstrated a normal distribution. Correspondingly, parametric tests were used during data analysis. Independent Groups t-test was used for comparing the pretest and post-test mean of the experimental and control groups, and Dependent Groups t-test to compare the pretest and post-test mean of the experimental and control groups in itself.

Findings

Findings Regarding the First Sub-Problem

The first sub-problem of the study was "Is there a significant difference between the critical thinking skills through philosophical inquiry pretest and posttest scores of the children in the experimental and control groups?". Table 5 presents findings related to the Independent Samples t test results to reveal whether there was a difference between the groups.

Table 5. t-Test Results between the Pretest and Posttest Scores of the CTSPI

Groups	Test	N	$\bar{X}$	Sd	t	df	p
Experimental	Pretest	20	2.79	.78	.144	38	.887
Control	Pretest	20	2.75	.72			
Experimental	Posttest	20	3.30	.87	1.337	38	.189
Control	Posttest	20	2.97	.69			

Table 5 suggests no significant difference between the experimental group pretest mean scores ($\bar{X}$=2.79) and the control group pretest mean scores ($\bar{X}$=2.75) regarding CTSPI measurements and the groups were close to each other (p=.887>.05). Considering the measurements made as a result of the administering P4CC, no significant difference was identified across the experimental group posttest mean scores ($\bar{X}$=3.30) and the control group posttest mean scores ($\bar{X}$=2.97) (p=.189>.05). Although there was no statistically significant difference when the means of the groups were compared, a higher increase was noted across the mean of the experimental group, meaning that P4CC positively affects critical thinking skills through philosophical inquiry.

Findings Regarding the Second Sub-Problem

The second sub-problem of the study was, "Is there a significant difference between the children in the experimental group's critical thinking through philosophical inquiry pretest and posttest scores?". The results of the paired-samples t-test conducted to compare the experimental group's pretest and posttest CTSPI averages are shown in Table 6.

Table 6. t-Test Results between Experimental Group CTSPI Pretest and Posttest Scores

Group	Test	N	$\bar{X}$	Sd	t	df	p
Experimental	Pretest	20	2.79	.78	-7.174	19	.000*
	Posttest	20	3.30	.87			

*Significant at p<.05 level.

Table 6 demonstrates a significant difference between the experimental group's pretest score mean ($\bar{X}$=2.79) and that of the posttest score ($\bar{X}$=3.30) regarding CTSPI (p=.000<.05). Accordingly, it may be wise to mention that P4CC positively affects the critical thinking through philosophical inquiry levels of the children in the experimental group.

Findings Regarding the Third Sub-Problem

The third sub-problem of the study was, "Is there a significant difference between the children in the control group's critical thinking through philosophical inquiry pretest and posttest scores?". Table 7 shows the results of the paired-samples t-test conducted to compare the control group's pretest and posttest CTSPI averages.

Table 7. t-Test Results between Control Group CTSPI Pretest and Posttest Scores

Group	Test	N	$\bar{X}$	Sd	t	df	p
Control	Pretest	20	2.75	.72	-3.703	19	.002*
	Posttest	20	2.97	.69			

* Significant at p<.05 level.

According to Table 7, a significant difference was noted between the control group's pretest score mean ($\bar{X}$=2.75) and that of the post-test score ($\bar{X}$=2.97) regarding CTSPI (p=.002<.05). This may be because the Preschool Curriculum with which the students in the control group are familiar in this process has a positive effect on their critical thinking levels through philosophical inquiry.

Findings Regarding the Fourth Sub-Problem

The fourth sub-problem of the study was "Is there a significant difference between the problem-solving pretest and posttest scores of the children in the experimental and control groups?". Table 8 suggests findings regarding the Independent Samples t Test results conducted to compare the mean scores between the groups.

Table 8. t-Test Results between the Pretest and Posttest Scores of the PSSS

Groups	Test	N	$\bar{X}$	Sd	t	df	p
Experimental	Pretest	20	1.90	.42	1.051	38	.300
Control	Pretest	20	1.75	.45			
Experimental	Posttest	20	2.33	.40	2.407	38	.021*
Control	Posttest	20	2.00	.45			

* Significant at p<.05 level.

Upon analyzing Table 8, no significant difference was determined between the experimental group pretest mean scores ($\bar{X}$=1.90) and the control group pretest mean scores ($\bar{X}$=1.75) regarding PSSS measurements (p=.300>.05), referring that the groups were close to each other before the experimental operation. A significant difference was identified across the experimental group post-test mean scores ($\bar{X}$=2.33) and those of the control group ($\bar{X}$=2.00) (p=.021<.05). Based upon this finding, PSSS can be said to be effective on children's problem solving skills.

Findings Regarding the Fifth Sub-Problem

The fifth subproblem of the study was, "Is there a significant difference between the children in the experimental group's problem-solving pretest and posttest scores?". The results of the paired-samples t-test conducted to compare the mean scores of the experimental group's PSSS pretest and posttest are shown in Table 9.

Table 9. t-Test Results between Experimental Group PSSS Pretest and Posttest Scores

Group	Test	N	$\bar{X}$	Sd	t	df	p
Experimental	Pretest	20	1.90	.42	-5.245	19	.000*
	Posttest	20	2.33	.40			

* Significant at p<.05 level.

Table 9 reveals that there was significant difference between the experimental group's pretest score mean ($\bar{X}$=1.90) and that of the post-test score ($\bar{X}$=2.33) regarding PSSS (p=.000<.05). This means that P4CC positively affects the students' problem solving skills.

Findings Regarding the Sixth Sub-Problem

The sixth sub-problem of the study was "Is there a significant difference between the children in the control group's problem-solving pretest and posttest scores?". Findings related to the results of the Paired Samples t Test performed to compare the control group PSSS pretest and post-test averages are illustrated in Table 10.

Table 10. t-Test Results between Control Group PSSS Pretest and Posttest Scores

Group	Test	N	$\bar{X}$	Sd	t	df	p
Control	Pretest	20	1.75	.45	-3.677	19	.002*
	Posttest	20	2.00	.45			

* Significant at p<.05 level.

According to Table 10, a significant difference was identified between the means of the control group pretest scores ($\bar{X}$=1.75) and the posttest ($\bar{X}$=2,00) in favor of posttest (p=.002<.05). However, when the mean increases of the two groups were examined, the experimental group achieved a higher increase compared to the control group, indicating that P4CC is more effective on problem solving skills. In line with these findings, it can be interpreted that Preschool Curriculum has a positive effect on the problem solving skills of the students' problem solving skills in the control group.

Discussion, Result and Recommendations

Discussion and Results related to Critical Thinking Skills through Philosophical Inquiry

The results of the study showed that the Philosophy for Children curriculum promotes critical thinking skills through philosophical inquiry. Upon analyzing the relevant literature, various studies (Gasparatou & Kampeza, 2012; Karadağ & Yıldız Demirtaş, 2018; Lam, 2011) have shown that the Philosophy for Children Curriculum contributes to the development of critical thinking skills in line with the findings of the 1st and 2nd questions of this study. Gasparatou and Kampeza (2012) underlined the positive effect of P4C in the development of critical thinking. Gasparatou and Kampeza (2012) also conducted a study with control and experimental groups consisting of 30 children aged 5-6 years. Likewise, a total of 20 sessions were organized, using 8 picture books on topics such as friendship and respect for differences, which encourages asking questions and making comments**.** Karadağ and Yıldız Demirtaş (2018) formed a training program on the Philosophy for Children approach and after the implementation of the program, they concluded that it had a positive effect on the critical thinking skills of the preschoolers. Karadağ and Yıldız Demirtaş (2018) applied a 10-week P4C curriculum to a working group consisting of 30 children aged 5-6 years. Just as in our study, this curriculum devised in a manner consistent with the learning outcomes of the TMoNE preschool curriculum, asked questions about such topics as beauty, good-evil, forgetting, knowing-learning, thinking, tolerance, freedom, happiness, favor, and growing-maturing, and obtained similar results. Lam (2011) noted that P4C, which he affiliated 32 sessions over 16 weeks, played a significant role in developing students' critical thinking skills.

Studies (Benade, 2011; Naseri, Gorjian, Ebrahimi & Niakan, 2017; Rahdar, Pourghaz & Marziyeh, 2018) show that the Philosophy for Children approach has a significant effect on the level of critical thinking. For instance, Benade (2011) noted that implementing the Philosophy for Children approach within a 7-month program results in a significant difference in the critical thinking levels of primary school 5th grade students. Naseri, Gorjian, Ebrahimi and Niakan (2017) statistically demonstrated that the philosophical approach encourages critical thinking. Rahdar, Pourghaz and Marziyeh (2018) concluded that the philosophical practices conducted with children for 12 weeks positively impacted skills such as self-efficacy and critical thinking.

Though there was a greater increase in the posttest mean scores of the experimental group with the implemented program, no statistically significant difference was identified between the control group and the experimental group. Considering the reasons for the fact that no significant difference was found in terms of critical thinking dimension of the curriculum, these factors may include the time period and the number of the working group, as well as the learning outcomes of the Preschool Curriculum, including those related to critical thinking skills, and activities that allow critical thinking and inquiry-based thinking.

In their study, Fair, Haas, Gardosik, Johnson, Price and Leipnik (2015) found that the seventh-grade students who had experienced the P4C curriculum achieved significant gains relative to those in the seventh grade control group at a statistically significant level. Yet, the eighth-grade students in the experimental group did not have such gains compared to the control group. The reason for this was that the seventh-grade teachers started the program early in the school year and continued for a period of 22 to 26 weeks, whereas the eighth-grade teachers started later and used the curriculum only for 4 to 10 weeks. Thus, they argued that the P4C curriculum shows its real effects when students are involved in activities for a certain period of time. A significant effect on students can be achieved after approximately the 24th week of lessons. Besides, Daniel and Auriac (2011) claimed that critical thinking skill is not innate. Therefore, they agreed that critical thinking requires learning and that this learning can be managed and acquired successfully by students as long as they benefit from regular philosophical praxis. Fair, Haas, Gardosik, Johnson, Price, and Leipnik (2015) stated that P4C programs are unlikely to have a noticeable impact on students in just a few weeks because acclimating students to practices such as "justifying and explaining their views" and "critically evaluating reasons" are skills that require some repetition and practice.

The relevant literature also involves studies (Colom, Moriyón, Magro & Morilla, 2014; Fair, Haas, Gardosik, Johnson, Price & Leipnik, 2015; Sigurborsdottir, 1998) examining the effectiveness of the Philosophy for Children approach in the long run. Colom, Moriyón, Magro and Morilla (2014) conducted a longitudinal study considering that the Philosophy for Children program should be administered for a reduced period of time and throughout the school years in the long term. Sigurborsdottir (1998) implemented the Philosophy for Children approach with preschoolers over a period of two years and indicated that the curriculum increased critical thinking skills. Topping and Trickey (2015) state that short-term positive effects may occur for studies on Philosophy for Children, but on the contrary, it is possible to have "sleeping" gains that can take long years. Garcia-Moriyon, Rebollo and Colom (2005) argued that the intensive administration of P4C not only along a school year, but across several school years will provide a greater advantage in experimental groups than observed in the short term.

All these studies are in parallel to those of this study related to critical thinking. This study is thought to be supported with extra alternatives because the curriculum's insufficient length of time is a significant factor in showing the effectiveness of the curriculum. As a result, the administration of the curriculum in the longer term is expected to create more positive effects and marked differences in terms of critical thinking skills through philosophical inquiry.

Discussion and Results related to Problem-Solving Skills

Based on the results related to problem-solving skills in the 4th and 5th sub-problems of the study, a significant difference was found between problem-solving skills related to P4C. There are not many studies in the relevant literature that examine the effects of Philosophy for Children practise on problem solving skills; however, there are some studies that support the findings of this study. Gillies, Nichols and Burgh (2011) implied that the Philosophy for Children approach is the one that encourages reasoning and problem solving. Seifi, Shaghagni and Kalantari (2011) sought the effect of Philosophy for Children curriculum on secondary school students' self-esteem and their problem solving skills.

The results obtained after P4C was administered to the experimental group for a total of 15 sessions for 45 days showed that the experimental group's self-esteem level and problem-solving skills increased significantly. Likewise, Erfani, Shobeiri, Karimi and Atar (2014) conducted an experimental study aiming to examine the effect of philosophy instruction on the problem solving skills and creativity of secondary school students. In this regard, the experimental group was subjected to 8 sessions of P4C, each of which lasted 2 hours. The results indicated that P4C encourages the development of students' problem-solving skills and creativity. The results of the study were also evaluated in terms of the problem-solving and creativity levels of the male students and it was found that these were higher than those of the female students. Millett and Tapper (2012) also confirmed that philosophical inquiry with children is an approach that develops problem-solving skills.

Within the 6th sub-problem of the study, a significant difference was found between the pretest and posttest results of the control group.This may be because the pre-school curriculum that the control group received during the experimental process had a positive effect on problem-solving skills. Considering the Pre-School Curriculum, cognitive development includes "Learning outcome 19: She/he produces solutions to problematic situations." The field of social emotional development involves "Learning outcome 17: She/he solves problems with others.". These learning outcomes aim to improve the child's ability to solve the problems she/he encounters in daily life and social relationships.

In addition, curriculum explanations of field trips and arts activities include objectives related to the development of problem-solving skills. In their study, Gur and Kocak (2018) examined the effects of the thinking curriculum they created on the social problem-solving skills of 5-6-year-old children and found a statistically significant difference between the pretest and posttest scores of the experimental group and the control group. They stated that the preschool education that the control group received during the 5-month period in which the curriculum was implemented had a positive effect on the children's social problem-solving skills.

Hence, both P4C and Preschool Curriculum were determined to positively affect children's problem-solving skills. However, taking the PSSS post-test scores of both groups into account, a significant difference was observed in favor of the experimental group. This can be explained by the fact that the stages required for problem-solving skills are also the learning outcomes of the Philosophy for Children approach. Britz (1993) put forward that the problem-solving process is based on the sequenced steps such as identifying the problem, thinking to produce various solutions, brainstorming, choosing one solution or trying it out, and evaluating what

has been done. These prerequisites required for problem-solving skills are among the learning outcomes of the Philosophy for Children Curriculum, which is one of the thinking education approaches. Therefore, the children in this program hold some features such as multi-dimensional thinking, being able to look from different perspectives, and establishing cause-effect relationships, which is thought to contribute to the development of children's problem-solving skills. Similar findings emerged in the studies conducted by Erfani, Shobeiri, Karimi and Atar (2014), Gillies, Nichols and Burgh (2011), Gur and Kocak (2018), Millett and Tapper (2012), Seifi, Shaghagni and Kalantari (2011), Tok and Sevinç (2010).

Recommendations

Based upon the study findings, various recommendations were provided for the practitioners and further studies: Philosophy for Children Curriculum was facilitated in 20 sessions for 10 weeks in the present study. Spatial studies can be carried out to examine the long-term effectiveness of the curriculum in detail.

- This study analyzed the effect of the Philosophy for Children Curriculum on critical thinking through philosophical inquiry and problem-solving skills. Researchers may examine its effect in different areas.
- This study used a quantitative experimental research design. Researchers can analyze Philosophy for Children Curriculum in different dimensions and in more depth through using qualitative or mixed methods.
- This study was conducted in kindergartens of a public school. Researchers may seek and compare the Philosophy for Children approach at different educational levels or in different types of institutions.
- Researchers who will study on this subject can compare the Philosophy for Children Curriculum with other thinking curricula.
- Researchers can compare the Philosophy for Children Curriculum with other alternative programs applied in pre-school.

Author (s) Contribution Rate

1. Author: 60%, 2. Author: 40%

Conflicts of Interest

No potential conflict of interest

Ethical Approval (only for necessary papers)

Prior to administering the P4CC and pretests, necessary permissions were obtained from Turkey Çanakkale Provincial Directorate of National Education, the families of the children and the scale developers. The personal information form was filled by the families of the children**.**

References

Akkocaoğlu Çayır, N. (2015a). *A qualitative study on education of philosophy for children* [Unpublished doctoral dissertation]. University of Hacettepe, Graduate School of Educational Sciences, Ankara, Turkey.

Akkocaoğlu Çayır, N. (2015b). Philosophy for children. *Cito Education: Theory and Practice, 27,* 17-28.

Aydın, A., Selvitopu, A. & Kaya, M. (2018). Resources Invested in Education and PISA 2015 Results: A Comparative Study. *Elementary Education Online, 17*(3), 1283-1301.

Aydın Yardım, Z. (2005). *Childhood philosophy in literature for children in terms of global elements* [Unpublished master dissertation]. Ondokuz Mayıs University, Graduate School of Social Sciences, Samsun, Turkey.

Bahar, M., Nartgün, Z., Durmuş, S. & Bıçak, B. (2008). *Geleneksel-alternatif ölçme ve değerlendirme* (2. baskı). Ankara: Pegem Akademi.

Benade, L. (2011). Philosophy for children (P4C): a New Zealand school-based action research case study. *New Zealand Journal of Teachers' Work, 8*(2), 141-155.

Boyacı, N. P., Karadağ, F. & Gülenç, K. (2018). Philosophy for children / philosophy with children: Philosophical methods, applicatıons and objectives. *Kaygı. Bursa Uludağ University Faculty of Arts and Sciences Journal of Philosophy, 31,* 145-173.

Boyraz, C. & Türcan, B. (2017). Çocuklar için felsefe eğitiminde görsel materyallerin kullanımı: TRT çocuk örneği. *EJER 2017 Konferansı Bildiri Özetleri Kitabı,* 888-889.

Britz, J. (1993). *Problem solving in early childhood classrooms* (ED355040). ERIC. https://files.eric.ed.gov/fulltext/ED355040.pdf

Büyüköztürk, Ş. (2016). *Deneysel desenler öntest-sontest kontrol grubu desen ve veri analizi.* Ankara: Pegem Akademi.

Colom, R., Moriyón, FG., Magro, C. & Morilla, E. (2014). The long-term impact of philosophy for children: A longitudinal study (preliminary results). *Analytic Teaching and Philosophical Praxis, 35*(1), 50-56.

Dalğar, G. (2017*). Examining the effect of visual art education programme on the critical thinking skills of preschool children* [Unpublished doctoral dissertation]. Gazi University, Graduate School of Social Sciences, Ankara, Turkey.

Daniel, MF. & Auriac, E. (2011). Philosophy, critical thinking and philosophy for children. *Educational Philosophy and Theory, 43*(5), 415-435. https://doi.org/10.1111/j.1469-5812.2008.00483.x

Dumitru, D. (2012). Communities of inquiry. A method to teach. *Procedia-Social and Behavioral Sciences, 33,* 238-242.

Durmuş, E. (2008). Eğitimde rehberlik hizmetleri. ME. Deniz, A. Erözkan (Ed.), *Psikolojik Danışma ve Rehberlik* (95-128). Ankara: Maya Akademi.

Erdoğan, P. (2018). *A study on the intellectual, historical and social foundations of the philosophy with children approach* [Unpublished master dissertation]. Ankara University, Graduate School of Educational Sciences, Ankara, Turkey.

Erfani, N., Shobeiri, SM., Karimi, L. & Atar, S. (2014). The effect of teaching philosophy for the children on student's problem-solving skill and creativity. *International Journal of Management and Humanity Sciences, 3,* 1603-1608.

ERG (2008). *Critical Thinking*. İstanbul: University of Sabancı. http://www.egitimreformugirisimi.org/wp-content/uploads/2017/03/Elestirreldusunme_0.pdf

Fair, F., Haas, LE., Gardosik, C., Johnson, DD., Price, DP. & Leipnik, O. (2015). Socrates in the schools from Scotland to Texas: Replicating a study on the effects of a philosophy for children program. *Journal of Philosophy in Schools 2*(1), 18-37.

Funston, J. (2017). Toward a critical philosophy for children. *Portland State University McNair Scholars Online Journal, 11,* 1-17.

Garcia-Moriyon, F., Rebollo, İ. & Colom, R. (2005). Evaluating philosophy for children: A Meta-analysis. *Thinking: The Journal of Philosophy for Children, 17*(4), 14-22. https://doi.org/10.5840/thinking20051743

Gasparatou, R. & Kampeza, M. (2012). Introducing P4C in kindergarten in Greece. *Analytic Teaching and Philosophical Praxis, 33*(1), 72-82.

George, D. & Mallery, P. (2010). *SPSS for Windows step by step:a simple study guide and reference* (10th ed.). Boston: Allyn & Bacon.

Gillies, RM., Nichols, K. & Burgh, G. (2011). Promoting problem-solving and reasoning during cooperative inquiry science. *Teaching Education, 22(*4), 427-443. http://dx.doi.org/10.1080/10476210.2011.610448

Gur, C. & Kocak, N. (2018). The effect of TMPT program on pre-school children's social problem solving skills. *Eurasian Journal of Educational Research, 73*, 77-94.

Heyman, GD. (2008). Children's critical thinking when learning from others. *Current Directions in Psychological Science, 17*(5), 344-347. https://doi.org/10.1111/j.1467-8721.2008.00603.x

Imany, H., Ahghar, G. & Seif Naraghi, M. (2016). The role of philosophy for children (p4c) teaching approach for improving the reading comprehension skills of guidance school female students. *Interdisciplinary Journal of Education, 1*(1), 54-59.

Johnson, AP. (2015). *Eylem araştırması el kitabı* (Y. Uzuner ve M. Ö. Anay, Çev.). Ankara: Anı.

Juuso, H. (2007). *Child, philosophy and education: discussing the intellectual sources of philosophy for children* [Unpublished doctoral dissertation]. University of Oulu, Graduate School of Educational Sciences, Oulu, Finland.

Kant, I. (2015). *On Education.* California: CreateSpace Independent Publishing Platform.

Karadağ, F. & Yıldız Demirtaş, V. (2018). The effectiveness of the philosophy with children curriculum on critical thinking skills of pre-school children. *Education and Science, 43*(195), 19-40. http://dx.doi.org/10.15390/EB.2018.7268

Karadağ, F., Yıldız Demirtaş, V. & Yıldız, T. (2017). Development of critical thinking scale through philosophical inquiry for children 5-6 years old. *International Online Journal of Educational Sciences, 9*(4), 1025-1037.

Kefeli, İ. & Kara, U. (2008). Philosophical and critical thought development of child. *Ankara University Journal of Faculty of Educational Sciences (JFES), 41*(1), 339-357. https://doi.org/10.1501/Egifak_0000000193

Kınık, B. (2018). *An analysis of the impact Montessori-based individualized education program has on the problem-solving skills of children who need special education* [Unpublished master dissertation]. Abant İzzet Baysal University, Graduate School of Educational Sciences, Bolu, Turkey.

Lam, CM. (2011). Continuing Lipman's and Sharp's pioneering work on philosophy for children: using Harry to foster critical thinking in Hong Kong students. *Educational Research and Evaluation, 18*(2), 187-203. https://doi.org/10.1080/13803611.2012.658669

Lipman, M. (1996). *Natasha: Vygotskian dialogues*. New York: Teachers College Press.

Lone, JM. (2015). *The Philosophical child.* Lanham, Maryland: Rowman & Littlefield Publishers.

Matthews, GB. (2005). Children, irony and philosophy. *Theory and Research in Education, 3*(1), 81-95. https://doi.org/10.1177/1477878505049836

Millett, S. & Tapper, A. (2012). Benefits of collaborative philosophical inquiry in schools. *Educational Philosophy and Theory, 44*(5), 546-567. https://doi.org/10.1111/j.1469-5812.2010.00727.x

Mutlu, E. (2010). *Investigating the thinking levels of children in early childhood period (60-72 months) and attitudes of preschool teachers related to thinking education.* [Unpublished master dissertation]. Çanakkale Onsekiz Mart University, Graduate School of Social Sciences, Çanakkale, Turkey.

Naseri, S., Gorjian, Z., Ebrahimi, MR. & Niakan, M. (2017). Critical thinking in P4C (Philosophy for children) educators: An intervention study. *International Journal of Scientific Study, 5(7),* 108-113.

Oğuz, V. & Köksal Akyol, A. (2015). Problem-solving skills scale (PSSS) validity and reliability. *Çukurova University Faculty of Education Journal, 44*(1), 105-122.

Okur, M. (2008). *Effects of philosophy for children on social skills that are: assertiveness, self-control and cooperation at children of six years old.* [Unpublished master dissertation]. Marmara University, Graduate School of Educational Sciences, İstanbul, Turkey.

Rahdar, A., Pourghaz, A. & Marziyeh, A. (2018). The impact of teaching philosophy for children on critical openness and reflective skepticism in developing critical thinking and self efficacy. *International Journal of Instruction, 11*(3), 539-556.

Seifi Gandomani, MY., Shaghagni, F. & Kalantari, MS. (2011). Efficacy of philosophy for children program (P4C) on self-esteem and problem solving abilities of girls. *Journal of Apllied Psychology, 5*(2), 66-83.

Sigurborsdottir, I. (1998). Philosophy with children in Foldaborg: Development project in Foldaborg, a preschool in Reykjavik for children from 1-6 years. *International Journal of Early Childhood, 30*(1), 14-16. https://doi.org/10.1007/BF03400604

Taş, I. (2017). *The effects of philosophy for children on theory of mind and creativity of 48-72 month-old children.* [Unpublished doctoral dissertation]. Çukurova University, Graduate School of Social Sciences, Adana, Turkey.

Tok, E. & Sevinç, M. (2010). The effects of thinking skills education on the critical thinking and problem solving skills of preschool teacher candidates. *Pamukkale University Journal of Education, 27*(27), 67-82.

Topping, K. J. & Trickey, S. (2015). Philosophy for children: short and long term effects. In R. Wegerif, L. Li & J. C. Kaufman (Eds.), *The Routledge International Handbook of Research on Teaching Thinking* (pp.103-112). Abingdon, Oxon: Routledge.

Trickey, S. & Topping, KJ. (2004). 'Philosophy for children': a systematic review. *Research Papers in Education, 19*(3), 365-380. https://doi.org/10.1080/0267152042000248016

TMoNE-Turkish Ministry of National Education (2013). *The curriculum of preschool education*. Ankara, Turkey.

Tümkaya, S. & Gülaçtı, F. (2010). *Erken çocukluk eğitimi.* Ankara: Nobel.

UNESCO (2007). *Philosophy a school of freedom.* Paris: UNESCO Publishing.

Valitalo, R. (2018). *The philosophical classroom: balancing educational purposes* [Unpublished doctoral dissertation]. University of Oulu, Graduate School of Educational Sciences, Oulu, Finland.

Vansieleghem, N. & Kennedy, D. (2011). What is philosophy for children, what is philosophy with children-after Matthew Lipman?. *Journal of Philosophy of Education,45*(2),171-182. https://doi.org/10.1111/j.1467-9752.2011.00801.x

Williams, M.K. (2017). John Dewey in the 21st century. *Journal of Inquiry & Action in Education, 9*(1),91-102.

Article History
Received: 06.12.2021
Received in revised form: 18.01.2022
Accepted: 22.02.2022
Article Type: Research Article

International Journal of Contemporary Educational Research (IJCER)

www.ijcer.net

The Role of Argumentative Writing in Teaching Controversial Issues: A Mixed Methods Research

Elif Meral[1], Fatih Kayaalp[2], Zeynep Başci Namli[3]
[1]Atatürk University, 0000-0002-2560-0120
[2]Zonguldak Bülent Ecevit University, 0000-0001-7640-5045
[3]Atatürk University, 0000-0003-2865-5976

To cite this article:

Meral, E., Kayaalp, F., & Başçı-Namlı, Z. (2022). The Role of Argumentative Writing in Teaching Controversial Issues: A Mixed Methods Research. *International Journal of Contemporary Educational Research*, *9*(1), 143-163. https://doi.org/10.33200/ijcer.1033411

International Journal of Contemporary Educational Research

Volume 9, Number 1, March 2022, 143-163 ISSN: 2148-3868

The Role of Argumentative Writing in Teaching Controversial Issues: A Mixed Methods Research

Elif Meral[1*], Fatih Kayaalp[2], Zeynep Başci Namli[1]
[1]Atatürk University
[2]Zonguldak Bülent Ecevit University

Abstract

The purpose of this study is to examine the role of argumentative writing in teaching controversial issues in Social Studies education. We employed the convergent design as a mixed-methods approach. The sample consisted of 49 prospective social studies teachers.Data were collected through an attitude scale towards controversial issues, semi-structured interview forms, focus group interviews, and respondents' diaries. The respondents were also asked to write argumentative essays on particularly controversial issues (i.e., brain migration, technology, nuclear energy, and different types of government) in the Social Studies course. The written tasks were evaluated throughout the period. Descriptive and predictive analyses were used to examine the quantitative data, while content and descriptive analyses were performed for the qualitative data, which were additionally analysed using MAXQDA 2020. A statistical significance was found between the respondents' pre-test and post-test scores regarding controversial issues. It appeared that drawing on controversial matters was effective in developing certain skills such as researching, critical thinking, recognizing one's own opinions, respecting different opinions, using scientific evidence, and making assessments. We believe that argumentative writing plays a critical role in developing these skills, which are likely to come out while teaching controversial issues. It could be assumed that writing argumentative essays is an alternative way for teachers to create a democratic classroom atmosphere while teaching controversial issues.

Keywords: Controversial issues, Argumentative writing, Social studies teaching

Introduction

Through the discourse of "Hard questions: Learning to teach controversial issues", Pace (2021) pointed out that the world we live in is faced with increasing political, social, economic, and environmental problems, and that it is now more urgent than ever to teach controversial issues. The use of controversial issues (Hand & Levinson, 2012), defined as rational disagreements with opposing views, is an important pedagogical way to both raise awareness of social problems and enable students to acquire a variety of skills necessary to address them (National Council for Social Studies [NCSS], 2016). Science plays a major role in finding solutions to many issues that are considered controversial in all societies (Oulton, Dillon & Grace, 2007). Regarding the solution process, despite the clear impact of controversial issues in the field of social sciences and socio-scientific issues including both scientific and social issues in the field of science (Çepni & Geçit, 2020), they are often avoided while teaching (Pace, 2021). In this respect, there are sources of problems such as school management, parental attitude and classroom climate (Baki-Pala, 2020), and the idea that knowledge is absolutely invariable (Kelly, 1986). One of the important reasons why controversial issues are not included in the teaching process is the inadequacy of teachers in terms of suitable methods on how to teach them (Nganga et al., 2020). Given that, the success in teaching controversial issues seems to be directly proportional to teachers' proficiency in these subjects (Öztürk & Kuş, 2019).

The present study resulted from the concern of how to teach controversial issues in the Social Studies course in a more qualified manner and draw attention to them. We aimed to build an alternative teaching process by integrating the nature of controversial issues and the functions of argumentative writing.

* Corresponding Author: *Elif Meral, elif.meral@atauni.edu.tr*

Theoretical Framework

Controversial Issues and Social Studies

Controversial issues, which inherently contain many conflicts (Hedley & Markowitz, 2001), refer to a range of different ideas based on different values, beliefs, and interests (Dynneson & Gross, 1985), as well as political, economic, religious, moral, social, or individual issues and problems of interest to society as a whole (Yazıcı & Seçgin, 2010). In other words, controversial issues are those about which the society has obvious disagreements, is divided and segregated, and makes contradictory statements or offer solutions by taking different values as criteria (Stradling, 1984, p. 2). Also, controversial issues include people's values or beliefs, but are also considered important by the majority and concern the general public, yet cannot be solved by reaching a consensus on an opinion (Avaroğulları, 2015 p. 140). Since controversial issues are themselves controversial (Dearden, 1981; Dewhurst, 1992), it is not possible to express controversial issues with a widely recognised definition. This is believed to be because the definitions of controversial issues are handled in the context of subjective criteria. Bailey (1975) emphasized the fact that many people have different opinions about an issue and put forward contradictory ideas about it, thus making it controversial, whereas Dearden (1981) indicated that the assertion of rational and logical but contradictory ideas about an issue makes that controversial. Although controversial issues differ according to individuals' values, moral codes, and ethical principles (Oulton, Dillon & Grace, 2004), it stands out as an important tool that prepares students to avoid and resolve conflict and seek peaceful solutions (Hedley & Markowitz, 2001).

Schools must help students learn to deal with problems related to their own lives, make judgments about these problems, and take responsibility for their own lives (Dewhurst, 1992). This reality revealed by Dewhurst for schools is the best answer to the question, 'Why should controversial issues be included in schools?', since the topic of controversial issues is an effective tool for learners to think about real-life problems, evaluate different perspectives, produce versatile solutions to problems, and put forward their own ideas with justifications. In addition, discussing over controversial issues helps develop students' attitudes and skills such as learning about social problems, critical thinking, and willingness to compromise (National Council for Social Studies [NCSS], 2016). In this sense, students' confrontation with controversial issues allows them to think more deeply about the content, to compare their own values and those of others (Soley, 1996), thereby developing a critical consciousness. In addition, this developing critical consciousness allows people to define how they understand the world, how others behave, and a perspective on creating a more just world for everyone (Misco, 2012). In this process, controversial issues develop certain skills and attitudes such as examining current problems, making rational choices among alternatives, using rational methods when dealing with problems, understanding that different perspectives are normal and valuable, and recognizing that reasonable compromise is part of the democratic decision-making process (NCSS, 2016). At this stage, discussing a controversial issue improves the reflective dialogue among students (Harwood & Hahn, 1990), allowing them to accept the existence of different perspectives on a given issue (Byford, Lennon & Russell, 2009).

In healthy democracies, learners must be exposed to controversial issues so that they will become active, participatory, and sensitive individuals towards social phenomena (Yazıcı & Seçgin, 2010). To clarify the question of 'How will controversial issues be adapted to the teaching process?', Apter (2016) indicated that "*theoretically, schools, especially Social Studies classes, are of particular importance for students to take part in current and historical discussions that focus on controversial issues*". When considered together, it is not difficult to integrate the controversial issues with the Social Studies course. The fact that Social Studies consists of political and social issues that concern the general public and that democracy education is an interdisciplinary field to be carried out actively strengthens the bond between controversial issues and Social Studies (Baloğlu-Uğurlu & Doğan, 2016). Many reasons have been presented to strengthen this bond, such as: a) preparing students for citizen roles in a pluralistic democracy, b) developing critical thinking skills, and c) improving interpersonal skills (Harwood & Hahn, 1990). The main rationale of those who argue that controversial issues should be included in the curriculum of social science courses is the view that opening unresolved, current controversial social issues to discussion will help students acquire the necessary skills as citizens of a democratic society (Baki-Pala, 2020).The reason for such understanding is that the essence of a healthy democracy is to ensure open dialogue on matters of public interest. In this regard, discussion of controversial social, political, and economic issues should be an integral part of the education provided to young citizens (Harwood & Hahn, 1990). In other words, controversial issues are a major aspect of citizenship education and very influential in developing students' competencies regarding citizenship. (Ersoy, 2013). Being aware of the relationship between controversial issues and the goals of social studies, teachers of this subject tend to include such issues in their lessons while teaching their students to be

sensitive to the problems of their country and the world and enabling them to improve their civic competence (Öztürk & Kuş, 2016). Apparently, controversial issues make remarkable contributions to students in terms of gaining knowledge, skills, and values regarding the Social Studies course (Çopur & Demirel, 2016). The benefit of these contributions is, however, as real as the difficulty of bringing controversial issues into learning environments (Günal & Kaya, 2016). Many factors could be associated with this difficulty, such as. lack of knowledge about controversial issues, time management problems, concern about not being able to complete the curriculum (Günal & Kaya, 2016), teachers' feeling of inadequacy on such issues (Aynuz, 2020), parents' possible reactions (Günal & Kaya, 2016; Yazıcı & Seçgin, 2010), school administration (Abu-Mamdan & Khader, 2014), fear of being misunderstood, fear of exam-oriented teaching (Çopur & Demirel, 2016), class management problems (Öztürk & Kuş, 2019; Tuncer, 2018), and professional inadequacies regarding certain teaching methods on how to teach such topics (Avaroğulları, 2015).Despite the crucial responsibilities of educational stakeholders in overcoming these problems, teachers still play the central role. Teachers should, therefore, be able to support students' critical thinking skills in teaching controversial issues, design the classroom environment appropriately in line with instilling in respect for different ideas, and approach controversial issues consciously by being aware of their own academic freedom (Öntaş et al., 2021). In other words, controversial issues should be examined in a Social Studies class without assuming that there is only one "correct" answer to controversial issues (Rambosk, 2011). Social Studies teachers should enable students to gain a critical view by confronting them with different ideas (NCSS, 2016). In the event of a lack of an approach that encourages research on controversial issues, critical thinking and developing evidence-based arguments, the aims of Social Studies teaching will not be achieved at the desired level (Yılmaz, 2012). Teachers' attitudes (Lockwood, 1996), who are the main actors to implement the curriculum towards controversial issues are also the key determinants in achieving these desired goals. As a matter of fact, Hess (2005) stated that teachers exhibit four different attitudes referred to as "denial, privilege, avoidance, and balance". Similarly, Kelly (1986) emphasized that teachers who bring controversial issues into their classrooms adopt and display approaches such as exclusive neutrality, exclusive partiality, neutral impartiality, and engaged impartiality. Just like Hess and Kelly, Kitson and McCully (2005), evaluated the roles of teachers, and indicated that teachers assume roles in such a way as to show avoiding, containing, and risk-taking attitude. Starting with the motto "*Hard questions: Learning to teach controversial issues*", Pace (2021), drew a framework consisting of eight steps on how to teach controversial issues.

Contrary to what was pointed out by Philpott et al., (2011) who drew attention to controversial issues by saying, "Controversial issues: To teach or not to teach? That is the question!", Goodall asserted that children are already aware of social problems and conflicts, so our main question should be "How should we teach?" rather than asking, "Should we teach?" or "Should we not teach?" (Goodall, 2007, as cited in Baki-Pala, 2020). In line with the suggestions of Goodall, this study focuses on how we should teach controversial issues. First of all, the ideas of prospective teachers on how to teach controversial issues were taken, as presented in Figure 1. (The vast majority of prospective teachers stated that they had no idea about how to teach controversial issues, while some stated that teaching methods and techniques such as debating, brainstorming, and panel discussion could be used.)

Figure 1. Ideas on how to teach controversial issues

The image that emerged in this study is also found in the literature, especially in a recent study by Nganga, et al. (2020). The authors reported that most of the respondents had limited knowledge about the methods to teach controversial issues and pointed to the fact that they did not lead a way of life that would help them acquire knowledge, experience, and teaching skills about controversial issues. In a study by Aynuz (2020), the prospective teachers emphasized that it is important to provide a democratic classroom environment to teach controversial issues. Still, they could not reveal clear visibility on how the teaching process would be carried out. Having focused on the teaching practices of Social Studies teachers, Öztürk and Kuş (2019) determined that teachers mostly used the method of lecturing, while the discussion method was the least for teaching controversial issues, which they found very interesting. Likewise, Fakhruddin and Soekardjo (2021) stated in their study that teachers

were not knowledgeable enough about how to teach controversial issues. Success in teaching controversial issues is directly related to teachers' knowledge regarding the teaching approach, method and techniques used in the teaching process of these subjects (Öztürk & Kuş, 2019). There are some other different models for teaching controversial issues in the literature. For example, Hess (2002) proposed *town meeting model, seminar model, and public issues discussion model;* Rossi (2006) offered *scored discussion, structured academic controversy, and advocate decision,* and Hand and Levinson (2012*)* suggested *discussion,* and Johnson, Johnson, and Smith (2000) set several models such as *constructive controversy*.

Having made a broad assessment of how controversial issues can be taught, Baki-Pala (2020) pointed out that argumentation is one of the teaching approaches used in teaching controversial issues. It is believed that "argumentative writing", which brings together the multiple effects of writing on cognitive and affective learning processes and the basic components of argumentation, can be an alternative approach in teaching controversial issues (Dingler, 2017).

Argumentative Writing

Based on using the patterns of written language to express ideas or messages (Murtadho, 2021), writing is an important competence that develops the skills of synthesis, comprehensionskills for disseminating information (Arroyo, Fernández-Lancho & Martínez, 2021). It is a skill that aims to use language to express language in written form through cognitive and organizational strategies (Anggraeny & Putra, 2017). In fact, Setyowati, Sukmawa, and Latief (2017) asserted that writing skill is one of the strong criteria of intelligence. In other words, by enabling people to reflect representations of reasoning, recording, examining, and evaluating information (Ferrethi & Graham, 2019), writing plays an important role in learning and enhancing self-expression (Graham, Gillespie, & McKeown, 2013). Briefly, writing provides an environment where new concepts are associated with known ones, information is synthesized, relationships and inferences are discovered, and basic elements of knowledge are acquired (Bangert-Drowns, Hurley & Wilkinson, 2004). Argumentation is a crucial booster in ensuring to create such an environment. The reason for it is that it is composed of a discussion process in which students present different reasons to support or refute the claims about certain topics (Duschl, Ellenbogen & Erduran, 1999), as well as the process of inference of their own claims and ideas (Zohar & Nemet, 2002). As a process of making claims and using evidence and reasoning to support them, argumentation (Jin, Su & Lei, 2020) is an approach used to comprehend and demonstrate the importance of a particular issue (Kuhn, 2005). Argumentation is a prerequisite for persuasion in writing (Driver, Newton & Osborne, 2000) and an essential tool for argumentative writing (Ebadi & Rahimi, 2018).

By supporting arguments in written form (Ferretti, Lewis & Andrews-Weckerly, 2009) and making students adopt a certain point of view and then convince other parties to take the same point of view (Nippold, Ward-Lonergan, & Fanning, 2005), argumentative writing is becoming a critical skill, particularly focused on reasoning and debate, in today's century (UNESCO, 2016).This skill inspires students to research from reliable sources (Setyowati et al., 2017) to collect evidence, gather and evaluate such evidence, develop their knowledge, and form various arguments (Murtadho, 2021). It includes identifying the empirical or experiment-based evidence for a claim, evaluating the claim that makes up the argument, and the reasons linking the evidence and the situation (Allison et al., 2021). An argument, which can be considered a building block of argumentative writing in this assessment, occurs when the author attempts to persuade the respective target audience through justification and evidence (Vorobej, 2006). Facts must be presented in a systematic, logical and orderly manner so that an author can reach a convincing conclusion (Fisher, 2013). However, this presentation is not an easy task, as argumentative writing requires quite complex cognitive and linguistic skills (Nippold & Ward-Lonergan, 2010; Dingler, 2017; Drid, 2014; Ferretti & Fan, 2016) and involves teachers' complex social interactions with their students during the teaching process (Olsen et al., 2017). Argumentative writing is therefore a very difficult process for many students (Fan & Chen, 2021; Gleason, 1999). Such a difficulty is likely to cause students to be unable to merge relevant evidence, results, and opinions while writing an essay on account of their insufficient knowledge about argumentation (Koh, 2004). Besides that, many students lack effective argumentation skills, making it difficult for them to offer competent evidence to support a claim or develop their argument with counter-claims (Liu & Stapleton, 2014). Argumentative writing is actually composed of both the structural process of words, phrases, and sentences, and a much more complex process including the aspects such as understanding the issue, developing the statements, editing with a correlative manner, and putting ideas into writing (Pei et al., 2017). In this process, students should master the complex aspects of argumentative writing and gain skills in composing the text from an analytical framework (Cambell & Filimon, 2018). In order to ensure this, it is important to develop students' metacognitive and critical thinking capacities (Murtadho, 2021). According to Fisher (2013), the better students' metacognitive and critical thinking skills are, the better they will be able to write an argumentative article fluently. To do this, students should be encouraged to think critically or participate in discussions, considering

different views or arguments (Salminen, Marttunen & Laurinen, 2010).The nature of argumentative writing enables students to develop their knowledge while being engaged in argumentative learning or the problem-solving and reasoning processes necessary to gain this perspective (Kiuhara et al., 2020). In fact, it is described as a problem-solving process that requires the author to self-regulate to reach a persuasive goal (Graham & Harris, 1997) from the cognitive perspective (Graham, 2018; MacArthur & Graham, 2016). It specifically indicates a developed aspect of writing based on students' cognitive abilities rather than language proficiency (Ferretti & Lewis, 2013). However, it has a positive impact on students' conceptual understanding and problem-solving skills and their ability to communicate with a genuine and scientific manner (Aquirre-Mendez et al., 2020). Argumentative writing process enables students to develop their skills as regards scientific thinking, learning and research skills (Diaz, 2017), and acquire knowledge (Driver, Newton & Osborne, 2000). This may lead to a significant rise in an individual's intrinsic motivation in academic terms (Chinn, 2006). Research shows that argumentative writing, which is a demanding but necessary process, can be developed with various instructional practices (Allison et al., 2021). As a matter of fact, to the improve the process of argumentative writing, Fan and Chen (2021) emphasized the necessity to render trainings on argumentation, besides including computer-aided activities; Negari (2011) suggested the use of concept maps, and Latifi et al. (2021), and Noroozi and Hatami, (2019) pointed out the necessity of peer feedback.

With its unique framework based on the basic components of argumentation, argumentative writing is a process of making a final decision by presenting the claim, justification, data, refutations, and supporting ideas (Ferretti et al., 2009; Toulmin, 2003). This This process is believed to have an important role in teaching controversial issues as well as in different subject areas. In our study, we aimed to open for discussion the subjects of migration, technology, nuclear energy and different forms of governance, which are included in social studies teaching, by taking into account the elements of argumentative writing and developing different viewpoints on the subject matter.

Teaching controversial issues is a challenging task that requires teachers to create safe, supportive, and reliable classroom environments where students feel comfortable while listening respectfully to non-dominant perspectives and considering many others (Nganga et al., 2020). A teacher should feel competent in handling controversial issues and is supposed to prepare satisfying lesson plans and materials that encourage participation and be equipped to manage discussions (Hess, 2005). However, teachers can overcome the associated hurdles by adapting teaching strategies to produce lively and interesting lessons, encouraging student participation in discussions (Cotton, 2006, p. 237). Research has shown that teachers play a critical role in teaching controversial issues, but also that teachers lack sufficient knowledge of how to teach controversial issues (Philpott et al., 2011). Demircioğlu (2016), for example, emphasized that teachers lack enough knowledge about how to handle controversial issues, while Avaroğulları (2015) pointed to a change in the attitudes of teachers who had learned different teaching methods for teaching controversial issues. Similarly, Tuncer (2018) indicated that controversial issues should be included in the undergraduate curriculum, and Seçgin (2009) stated that prospective teachers should be trained on effective strategies for teaching controversial issues. Regarding how to teach controversial issues, the Ministry of National Education (2018) has provided a roadmap for teachers, stating that "current and controversial issues can be brought into the classroom through various discussion techniques by relating them to problem solving, critical thinking, use of evidence, decision making, and research skills" (Ministry of National Education [MoNE], 2018). However, it seems that it has not been clearly shown in terms of where this road-map will lead or how the aforementioned skills should be acquired. Most studies conducted on controversial issues seem to have aimed at revealing such issues and determining the opinions of teachers, prospective teachers, academics, and students in this regard (Abu-Mamdan & Khader, 2014; Baloğlu Uğurlu- Doğan, 2016; Byford, Lennon & Russell, 2009; Cotton, 2006; Çepni & Geçit, 2020; Demircioğlu, 2016; Ersoy, 2013; Günal & Kaya, 2016; Hess, 2005; Nganga et al., 2020; Öntaş et al., 2021; Öztürk, 2017; Tatar, 2019; Yücel, 2018; Uygun & Arslan, 2020; Yazıcı & Seçgin, 2010; Rambosk, 2011). In the light of this information, answers were sought to the following research questions:

1) Has the argumentative writing process led to a significant change in the prospective teachers' attitudes towards controversial issues?
2) In line with the prospective teachers' opinions concerning teaching controversial issues and the argumentative writing process:
    a) What is the impact of teaching controversial issues on prospective teachers?
    b) What is the impact of argumentative writing concerning teaching controversial issues?

Method

Research Design

In this paper, we employ the convergent design, as a mixed methods research approach. In this form of design, qualitative and quantitative data are analyzed and the results combined. It can be asserted that the convergent design is important in that it defines the research problem by means of quantitative and qualitative data and enables the problem to be handled from different perspectives by combining the available data (Creswell, 2017). The main purpose of this design is to collect various data that can be complementary on the same topic in order to understand the research problem in detail (Creswell & Plano-Clark, 2007; Morse, 1991). In a convergent design, data can be analyzed together or separately. In the case of analysing the data together, the qualitative data is converted into quantitative data, or the other way around. Still, there seems to be a convergence or divergence of the results if the quantitative data is converted into qualitative data when the data is analyzed separately. What is important in the convergent design is that the strengths of quantitative and qualitative data complement each other, and likewise, the weaknesses of each balance each other (Freankel, Wallen & Hyun, 2012). Creswell (2017) emphasized the necessity of taking the following 3 steps into consideration while planning a research according to the convergent design, the main purpose of which is to merge the results obtained from the analysis of quantitative and qualitative research data: *i) collecting and analysing quantitative and qualitative data separately, ii) merging or gathering two data sets together, iii) determining the extent to which the quallllitative results confirm the quantitative results confirm the quantitative results confirm the quantitative results confirm the quantitative results confirm the quantitative results after the results have been merged.* Figure 2 below presents the symbolic view of the convergent design.

Figure 2. Convergent design, (Creswell, 2017)

To determine the impact of argumentative writing in teaching controversial issues, we collected the quantitative and qualitative data separately, performed the data analysis separately, and merged the analyzed quantitative and qualitative data in the Results section. Then, the merged findings were interpreted in the Conclusion and Discussion sections. Figure 3 presents the general scheme of the research methodology.

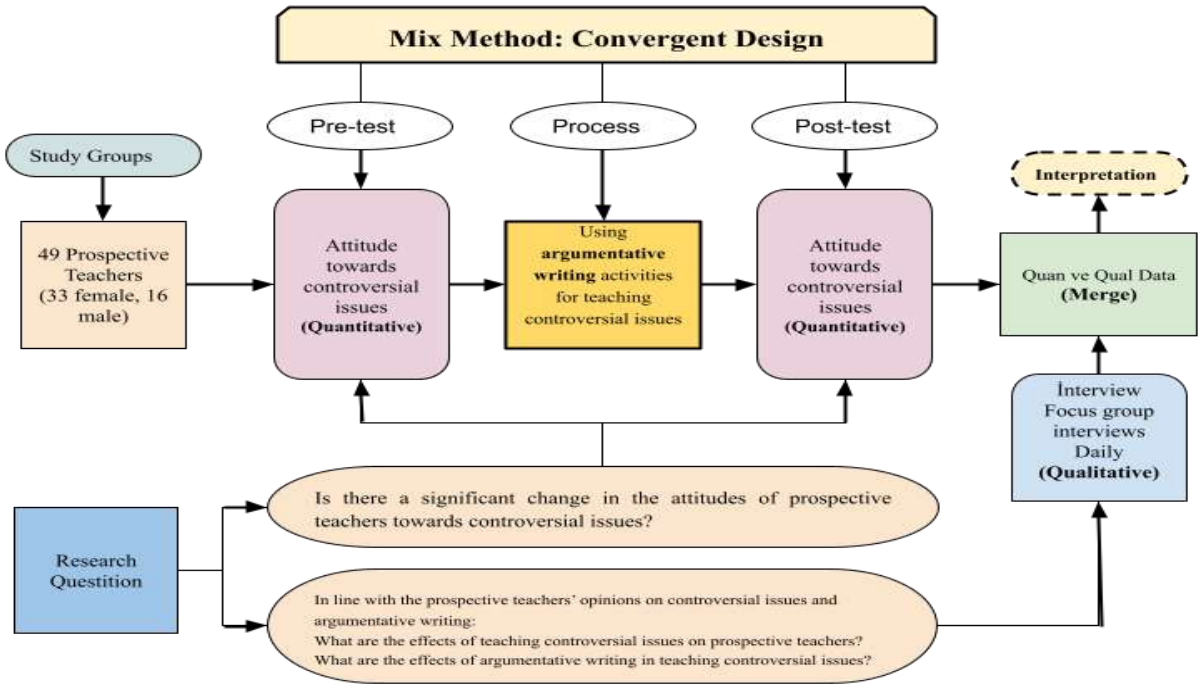


Figure 3. Research process

Sample

This study was conducted with a total of 49 prospective teachers (33 female; 16 male) studying Social Studies Teaching at a public university in the 2020/21 academic year. Since the research was conducted according to the convergent design, two basic issues were taken into consideration while determining the sample groups. The first of these is *to collect data from different groups in the event that the aim is to compare the perspectives of different groups, and the second is to collect data from the same individuals if the aim is to verify the data collected in one way (quantitative or qualitative) in another way* (Creswell, 2017). Since this study sought the latter case, the quantitative and qualitative data were collected from the same sample group, all of whom (49 prospective teachers) participated in the diary activity, 18 in the semi-structured interviews after being selected from the sample, and 10 in the focus group interviews. The level of argumentative writing of the prospective teachers (weak, moderate, strong) was taken into account when selecting the individuals to be interviewed in the semi-structured interviews and the focus groups.

Data Collection Tools

Attitude Scale Towards Controversial Issues (ASTCI)

We employed the *Attitude Scale Towards Controversial Issues (ASTCI),* developed by Alagöz (2014), to determine prospective teachers' attitudes towards controversial issues. Consisting of a total of 34 items and 6 sub-dimensions (Discussion and viewpoints regarding controversial issues, the right to discuss and questioning, professional achievement, attitude towards discussion, attitude towards questions and problems, and a teacher's ability to choose a method), the scale was graded as a 5-point Likert scale, whose internal consistency reliability coefficient was found .93, while the Cronbach Alpha internal consistency reliability coefficient for the research was found .91. The attitude scale towards controversial issues was administered to the respondents through the Google forms during the distance education.

Semi-Structured Interview Form

The researchers prepared a semi-structured interview form so that the application process could be evaluated by the respondents. Since the study was carried out during the distance education in the pandemic, the interviews were conducted over a digital platform. In line with the prepared interview form, interviews were held with 18 prospective teachers. The respondents were informed that the interviews would be used only for research purposes. Their identity information would be kept confidential. They would be given codes instead of using their names (e.g., PT.1,…..,PT.18).

Focus Group Interviews

The focus group interviews were held with 10 prospective teachers to evaluate the implementation process. Since the study was conducted during the distance education period amid the pandemic, the interviews were carried out on a digital platform. The respondents were informed that the interviews would only be used for research purposes, their identities would be kept confidential and codes be used instead of their names (PT.19,….,PT.28).

Diaries

All of the respondents were asked to keep a diary to determine their individual evaluations regarding the implementation process after each activity. They were also asked to send the diaries they prepared to the researchers via e-mail. Those diaries were given codes (PT.1,….,PT.49).

Ethical Board Approval

Atatürk University, Educational Sciences Ethics Committee, dated 21/10/2021 with decision number 22, took this research's rationale, purpose, approach, and methods into account, and unanimously decided that there is no ethical and scientific inconvenience to the conduct of the study on the subject reported.

Implementation Process

In order to reveal the impact of argumentative writing on the way controversial issues were taught, a 4-week implementation was carried out with prospective teachers within the distance education period during the pandemic. Before starting the implementation, the respondents were informed about argumentative writing and

explained what needs to be done in the process. Then, a controversial issue was discussed each week and argumentative writing activities were conducted with the prospective teachers. Considering the learning areas in the social studies curriculum (MoNE, 2018), while determining the controversial issues, utmost attention was paid to the selection of issues related to the acquisitions (See Appendix -1). Table 1 presents the learning areas, accomplishments, and controversial issues discussed in the implementation process.

Table 1. Learning areas, accomplishments, and controversial issues

Learning areas	Accomplishments	Controversial issues
Science, Technology and Society	SB.4.4.2. Comparing the past and present uses of technological products. SB.5.4.1. Examining the impact of technology use on socialization and social relations.	Is technology helpful or harmful?
Production, Distribution and Consumption	SB.6.5.2. Analysing the impact of unmindful consumption of resources on lives of living beings; emphasizing the importance of renewable and non-renewable resources.	Is nuclear energy a disaster or salvation?
People, Places and Environments	SB.7.3.3. Discussing the causes and consequences of migration through case studies.	I would participate in the brain migration, I would not participate in the brain migration
Active Citizenship	SB.6.6.1. Comparing different forms of government in relation to the basic principles of democracy.	What do you think is the best form of government?

Figure 4 presents the argumentative writing activities used for teaching controversial issues during the implementation.

Figure 4. Argumentative writing process

Data Analysis

The quantitative and qualitative data set was organized before the data analysis. Normality analysis was first performed on the quantitative data. The histogram, normal Q-Q plot, detrended normal Q-Q plot graph, kurtosis and skewness values were examined to see whether the data showed a normal distribution (Tabachnick & Fidell, 2015; Pallant, 2005). Since the quantitative data showed a normal distribution ($p>0.05$; $p=.200$), the Paired Samples t-test, was used to analyze the quantitative data to calculate the effect size value. The eta- squared value is normally between 0.00 and 1.00, and considered as an effect size when it is between 0.01-0.06 (small), 0.06-0.14 (medium), 0.14 and above (large) (Green & Salkind, 2005; Pallant, 2005; Can, 2017). In our study, these values were taken into account to calculate the effect size. Qualitative data were analyzed by content analysis and descriptive analysis. In addition, the MAXQDA 2020 qualitative data analysis program was used to analyze semi-structured interviews. Then, the results obtained from the semi-structured interviews were supported by those obtained from the focus group interviews and diaries.

Validity and Reliability

The reliability coefficient was calculated by making a pilot process for the internal consistency reliability of the ASTCI used in the quantitative dimension of the study. Expert opinion was sought for the reliability of the data used in the qualitative dimension to calculate the reliability coefficient [(Reliability = number of agreements / (total number of agreements + number of disagreements)]. The reliability coefficient is desired to be 90% (Miles & Huberman, 2016). In this study, the reliability was calculated as 95%. Participant verification/confirmation is important in ensuring qualitative data's internal validity or credibility (Merriam, 2013).

Moreover, data diversity can be used in terms of the credibility of qualitative data (Yıldırım & Şimşek, 2016). In this sense, after the coding analysis of the qualitative data, the analysis results were sent to the prospective teachers from whom the qualitative data were obtained to collect the participants' opinions about the accuracy of the analysis results. In addition to that, data diversity (semi-structured interview, focus group interview and diary) was ensured for the credibility of the qualitative data. Direct quotations from different participants were included as well.

Results

This section first presents the quantitative results accounting for the attitudes of prospective Social Studies teachers towards controversial issues. Then, the qualitative results based on the respondents' opinions regarding the controversial issues and the argumentative writing process are included. In the last stage, quantitative and qualitative results are combined and interpreted.

Quantitative results

To determine the impact of the argumentative writing process on the attitudes of prospective teachers towards controversial issues, the Attitude Scale Towards Controversial Issues (ASTCI) was administered as a pre-test and post-test. Descriptive statistics of the data obtained from ASTCI and Paired Samples t-test results are presented in Table 2.

Table 2. Descriptive Statistics of Scores Obtained from Pre-Test and Post-Test Data of ASTCI and Paired Samples t-Test Results

ASTCI	N	$\overline{X}$	Ss	Sd	t	p
Pre-test	49	139.91	18.01	48	-6.269	.000
Post-test	49	157.36	12.82			

As shown in Table 2, the post-test mean score *($\overline{X}$ = 157.36)* of the prospective teachers' attitudes towards controversial issues is higher than the pre-test mean score *($\overline{X}$ = 139.91)*. Paired Samples t-test was performed to determine whether the mean difference was statistically significant. Table 2 shows that there is a statistically significant difference between pre-test and post-test scores of the respondents' attitudes towards controversial issues ($t_{(48)}$= *-6.269, p <.05)*. The effect size value calculated from the analysis was *d = 0.90*, indicating a large effect. In other words, using the method of argumentative writing led to a statistically significant difference in the prospective teachers' attitudes towards controversial issues.

Qualitative Results

This section first presents the results obtained with the semi-structured interview forms. Later, the results are supported on the basis of the focus group interviews and prospective teachers' diaries.

The respondents were asked, "What kind of contribution do you think it could make to students when controversial issues are included in the Social Studies lesson?". Figure 5 presents the MAX Maps Code Co-occurrence Model of the findings based on the opinions of the respondents regarding the impact of controversial issues on students.

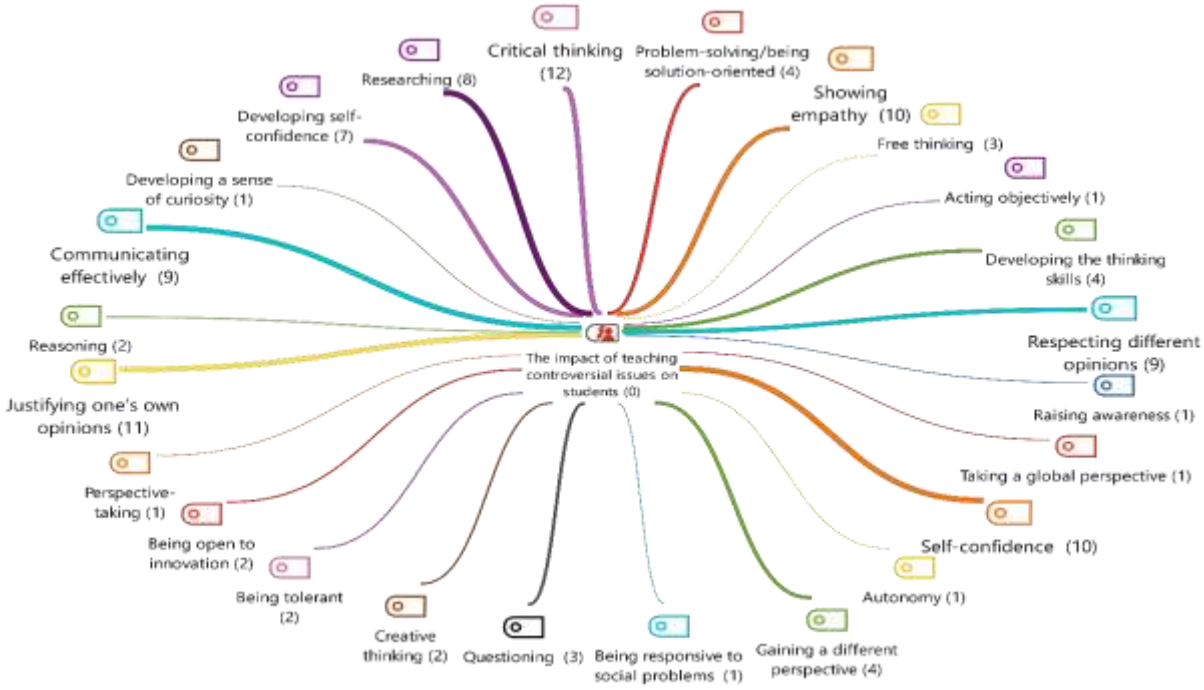


Figure 5. MAX Maps code co-occurrence model on the impact of using controversial issues

As shown in Figure 5, prospective Social Studies teachers made comprehensive evaluations of the impact of teaching controversial issues on students. As an example of the respondents' statements regarding these evaluations, PT.6 (he) said that being engaged with controversial issues "*...supports children's creative and critical thinking skills. In line with the dilemma, children express themselves by justifying the view that appeals to them, making criticism and expressing their thoughts on the subject. As a result, since students express themselves more by speaking, it affects their communication skills positively. In addition, it teaches to overcome the problems encountered by identifying the controversial issues learned in the lesson with daily life. It also encourages children to make discoveries by leading them to research so that they can defend their own thoughts, thereby increasing their self-confidence."* Just like PT.6, which highlighted the impact of controversial issues on students from different aspects, another respondent PT.19 (she), who had recorded the process of teaching controversial issues, stated: "When we came to the second week, I saw exactly that controversial issues are one of the main contexts of social studies teaching. When discussing controversial issues, I found it important to argue, think critically, and teach such issues without bias." He emphasized that the inclusion of controversial issues in social studies classes is effective in developing higher-order thinking skills in students. As can be seen in the diary of PT.19, such opinions became more visible and solidly based with the statement of PT.2 on controversial issues, "I think students' inclination to research and question will increase and they will be able to respect different feelings and support their thoughts with evidence."According to PT.18 (she), controversial issues comprised in Social Studies teaching "*firstly enable students to base their knowledge on solid foundations by filtering their own views, to respect the opinions of others, and to be tolerant. It gives a sense of independence and autonomy as they can freely justify their ideas while discussing. It also helps students contemplate and allows them to identify and analyse their own thoughts as well as others*", while for PT.4, controversial issues are the key to both thinking and respecting different ideas and learning by doing, and "*develop students' sense of empathy in the first place. Once they have realized that the opinion which they defend is not the only correct one, they learn to respect the opinions of others. At the same time, seeing their own mistakes through their own research is the most solid way of learning, making them never forget it again.*" The statements made by PT.4 also support the views of PT.22 (he), who explained his ideas on controversial issues in the focus group meeting, and said, "*Students makes a claim about the subject and conducts research to support it. They also see that there are different opinions other than theirs due to the rebuttals. This, in turn, develops the sense of empathy."* Making an assessment similar to that of PT.22, PT.9 (she) said that controversial issues, *"first of all, help individuals to self-respect. Every individual at any age wants to discuss about something. Well, let's look at controversial issues more professionally: When someone analyses and writes about evidence, rebuttals, claims, etc., we must make sure that he learns the following: Yes, I think so, but not because I said so. I strengthen my claim by basing this on certain reasons and certain evidence. Here, I think people learn to stand by their word and to express their thoughts without fear, but the best part of controversial issues is that there is never a bigoted and blind defence. I think so,*

but there are those who think the opposite of me. That person is now disguising himself as a completely different identity and indicating the opposing idea. Here, he witnesses the best dimension of empathy." When the views of both PT.9, PT.22 and PT.4 were brought together, they referred to a common point in the development of their ability to think multi-dimensionally, justify their thoughts, and be open to different ideas, as well as defend their own thoughts. Furthermore, the development of respect for different ideas and of empathy skills, as mentioned by many respondents, are clearly included in the diary of PT.40 (he), who had kept a diary about the teaching process of controversial issues, and said in his diary that, *"...even though I had difficulties in the process of writing on these topics, this process improved my ability to empathize and respect opposing opinions."* The reason given by PT.5 (them) for this development is that exposure to controversial issues "dispels students' misconceptions about such issues, helps them learn through action and experience (because students do their own research), and develops self-confidence and self-expression as they defend their views. They make a habit of respecting opposing views and develop their discussion skills," statements that echo those of PT.40.

PT.25 (he) emphasized in the focus group interview that students could understand that it is not only their own thoughts which are correct while learning about the controversial issues and argumentative writing, and said, *"With controversial issues, students can look at the existing issue from both sides and get scientific support by doing research. During this research process, the subject learned by the students become more permanent as they actively take part, or they will never forget it. Personally, my friends and I will not forget these issues. I think it will be the same in elementary or middle school.*" Drawing attention to the importance of controversial issues like PT.25, PT.11 (she) wrote the following in her diary in the last week, "*For four weeks we focused on controversial issues. I realized how important it is to teach controversial issues in the Social Studies course during that time. In the end, I learned that I need to be a teacher who incorporates controversial issues into the course, views them as richness, and believes that controversial issues are effective in developing individuals' decision-making skills and ability to use evidence," a statement that summarizes an optimal teaching process by emphasizing the need to include controversial issues in social studies classes and the importance of the teacher's role in teaching such issues.*The verbal and written expressions of prospective Social Studies teachers revealed the impact of teaching controversial issues on students. However, the question of the role of argumentative writing while teaching such issues is as important as the existing effects. In this context, the participants were asked what they thought about the impact of argumentative writing in teaching controversial issues. Figure 6 shows the MAX Maps Code Co-occurrence Model of the findings based on the respondents' views regarding the role of argumentative writing in teaching controversial issues.

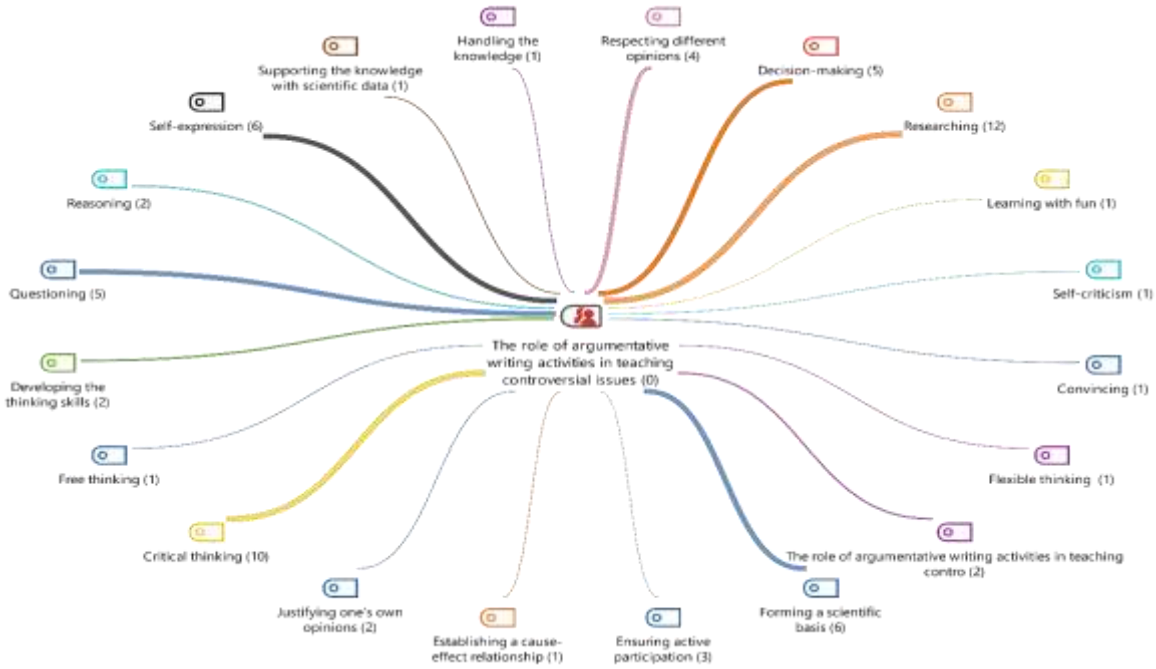


Figure 6. MAX Maps code co-occurrence model for the impact of argumentative writing

As shown in Figure 6, prospective Social Studies teachers made multidimensional evaluations about the role of argumentative writing activities used in teaching controversial issues. In this regard, PT.3 (he) said, "I think

argumentative writing plays a crucial role in teaching controversial topics and is very effective, whether it is doing research and getting the right information with evidence, or being able to find the opposing view and refute it with evidence. *This is because arguing with evidence in a reasonable way increases self-confidence. When it comes to refuting, the sense of empathy appears too. Argumentative writing can change the mind of an opposing person on controversial issues with evidence and rebuttals. I even changed my mind sometimes due to the results and sometimes to evidence I found while doing research*."

Some other prospective teachers also stressed the components of this comprehensive evaluation of PT.3 on argumentative writing. As an example of evaluating the role of argumentative writing in teaching controversial issues, PT.19 raised some points similar to those of PT.3 in the focus group interview, saying, "Before I saw the argumentative writing model, I only knew the debate method, which is based on defending an issue from only one perspective. *However, with this writing model, it is necessary first to answer the question of why I am defending this and to put forward the claim. Then I make a claim, but I have to prove it. For that, I need particular evidence. Writing also triggers the need for some research to refute the other party's view. Thus, people deal with the issue not one-dimensionally, but multi dimensionally. Apart from this, we make an objective evaluation in a more general sense, not a subjective evaluation, by making evaluations again"*, indicating her support of the statements made by PT.3 and pointed out different aspects of argumentative writing. Just like PT.19, PT.8 (she) pointed out that argumentative writing is an important alternative for students who are shy in the classroom and do not dare to speak and express their thoughts, and she said: *"Individuals or students who fail to express themselves verbally in front of the public are not likely to actively participate in the discussion. Therefore, learning cannot be fulfilled. In argumentative writing, however, students who are more introverted and have difficulty expressing themselves will be able to participate in a discussion by writing. They will be able to easily support a claim through research after expressing their opinions on controversial issues by writing. For this reason, all students can participate effectively when argumentative writing activities are included in the process of teaching controversial issues.*" This judgment of PT.8 regarding the role of argumentative writing integrated into learning environments is noteworthy since she stated that students (classmates) who have difficulty in verbalizing their feelings and thoughts based on their own experience and observation are more easily involved in learning processes through argumentative writing. Making comments on argumentative writing in the focus group interview, PT.24 (he) said, *"Before I talk about what I have gained through controversial issues, I would like to say that we have stereotypes and prejudices. Such issues and especially the part of the argumentative writing we used as rebuttal impacted me. I saw that many things that I thought were true could actually be different. I think this helped me to eliminate stereotypes and prejudices…",* pointing to the role of argumentative writing that created a significant change in him. Just like PT.24, who emphasizes the negative consequences of stereotypes and prejudices, PT.32 (she) mentions the following opinions in her diary: "...as our teacher said, people are hostile to what they do not know. The purpose of education is to reduce what we do not know. Controversial issues and argumentative writing have taught me that*".* Both PT.24 and PT.32 drew attention to the effect of argumentative writing in eliminating stereotypes and prejudices that pose an obstacle for free thinking, which is a prerequisite for controversial issues. Similarly, PT.47 (she) wrote in her diary as follows: *"Dear diary, … I know, chaos comes to your mind when you think of argumentation, but it's not like that at all... With argumentative writing, you can both discuss these issues and express your thoughts freely," pointing to an awareness of stereotypes attributed to the concept of argumentation and emphasizing the role of argumentative writing in that awareness. PT .16 (she) added, "I can say that I have learned to argue effectively thanks to argumentative writing activities.I can also say that I have learned to make a logical defence by justifying my own view within the framework of logic and listening to and taking into account the opposing view without fighting. In fact, apart from the one we defend from among controversial issues, we also get to know about two issues at the same time by researching the other party's issue thoroughly. Thanks to the argumentative writing activity, I learned to find and refute the opposing views and to base my evidence on more solid grounds." The positive attitude of PT.16 toward the process of argumentative writing that she mentioned in the focus group interview can also be seen in the following statements of PT.27 (er): "The argumentative writing activities have changed my perspective on teaching controversial issues in the following ways: Doing thorough research on the claim I was defending to get the necessary justifications for the correctness of my claim, some supporting ideas, as well as data that would refute the other party's opinion, gave me a sense of responsibility for the opinion I was seriously advocating." In a similar vein, PT.14 said that argumentative writing "encourages students and people to think scientifically. It teaches how to collect and evaluate data using scientific thinking steps. Argumentative writing teaches how to make step-by-step progress on controversial issues," drawing attention to the fact that argumentative writing builds on scientific thinking processes and asking the following question, "The most important role of argumentative writing is related to the questions of how argumentative writing scientifically supports the view we hold and how to refute the other party's arguments using evidence e."*

Taking a different stance on argumentative writing used for teaching controversial issues, PT.11 said: *"To me, the most important aspect of these writing activities in teaching controversial issues is that they provide mutual teaching. Just as the student learns from the teacher, the teacher can learn from the students. With this method, all students could actively be involved in the process"*, emphasizing the learner-centred aspect of argumentative writing. PT.28 (she), who also approached the learner-centred aspect of argumentative writing through her own experiences, said the following in the focus group interview, "*The argumentative writing model has contributed a lot to me in a positive sense. First of all, it helped me about the matters of research and analysis, and made me realize the fact that there are different views. Analysing the views, especially blending the information and revealing new things, developed me personally.*" As PT.28 mentioned, PT.40, who discussed the effects of argumentative writing through his development process, wrote the following in his diary: *"Argumentative writing has improved my respect for opposing ideas. Moreover, I learned to do research in more detail"*. As a matter of fact, saying that, *"I think argumentative writing could be used very efficiently in the classroom environment. In crowded classrooms, I believe it is a very suitable way for students to express themselves by writing"*, is also notable in terms of spreading the use of argumentative writing in learning environments.

Discussion, Conclusion and Recommendations

This study examined the impact of argumentative writing on teaching controversial issues within the Social Studies education. Both quantitative and qualitative data were used for the purpose of reaching a conclusion. Figure 7 presents the results based on merging the quantitative and qualitative data.

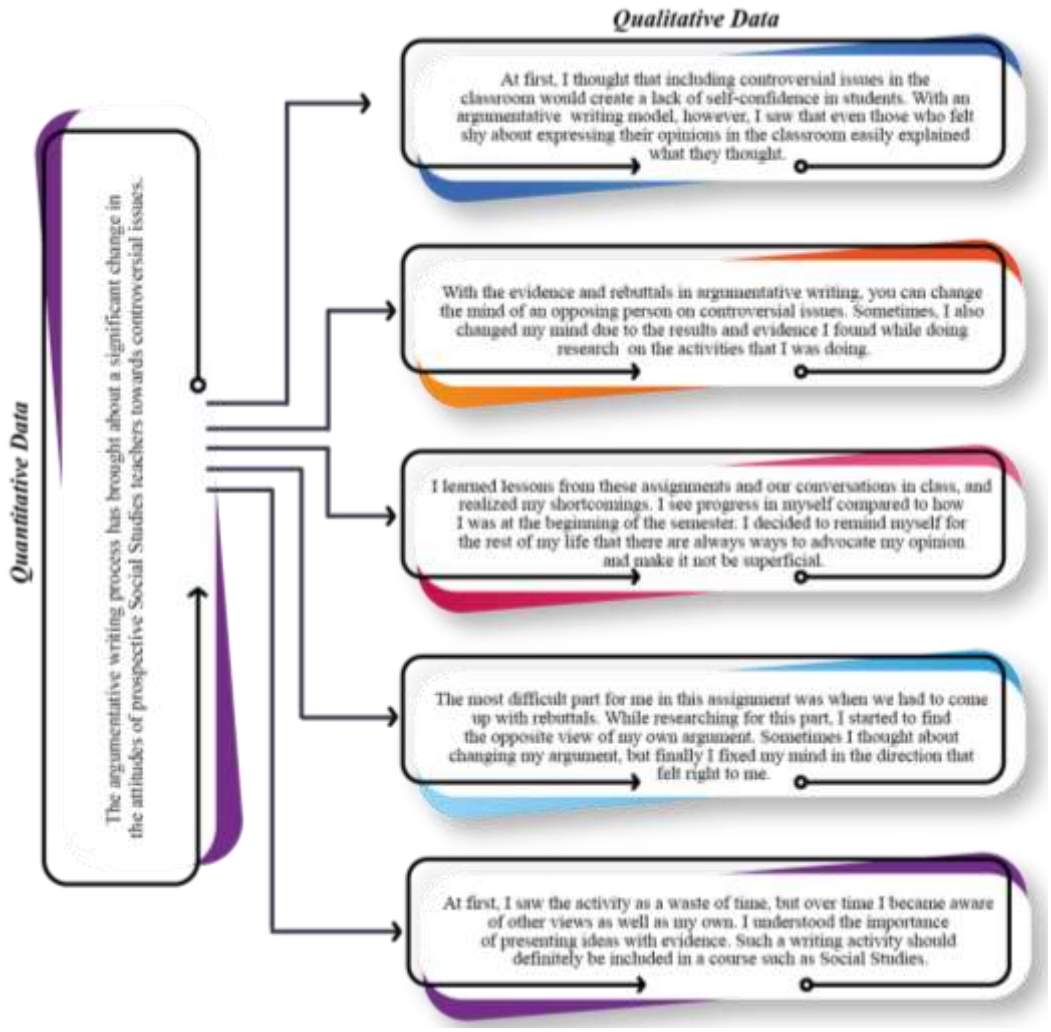


Figure 7. Combination of quantitative and qualitative data

As seen in Figure 7, both quantitative and qualitative results show that there has been a positive change in the attitudes of prospective Social Studies teachers towards controversial issues. Although the prospective teachers

faced with controversial issues experienced a sense of uncertainty at first, the nature of such issues have attracted their attention over time. In this context, expected improvement in attitudes can be achieved when the source of uncertainty regarding the teaching of controversial issues is eliminated. Such positive improvement was achieved in this study, just like it was in many different studies in the literature. Approaching controversial issues with reference to prospective teachers' readiness and motivation levels, Nganga et al. (2020) stated that the vast majority of prospective teachers received no training on such issues their perspectives on controversial issues changed after a relevant training. Similarly, Avaroğulları (2015) emphasized that the biggest difficulty in handling controversial issues is that teachers do not have the necessary knowledge about how to teach them. There seems to be a change in teachers' attitudes towards controversial issues after using it. There seems to be a change in teachers' attitudes towards controversial issues after using it various teaching methods for controversial issues. The influence of argumentative writing is undeniable in that it directly or indirectly draws prospective teachers to the focus of controversial issues in this study, which contributes to this change from its own angle. The reason is that argumentative writing involves not only the structural process of words, phrases, and sentences, but also a complex process that requires us to understand the topic, improve expressions, correlatively edit, and put ideas into writing (Pei et al., 2017).It should be noted that debating is a good way to gain understanding about a particular issue (Ellis, 2007). In fact, democratic societies need individuals who are skilled in debating (Dingler, 2017). Although not the only form of discussion, argumentative writing is one type of writing that comes to the fore in classrooms where argumentative logic should be taught (Olsen et al., 2017).In this way, it is ensured that students gain knowledge by participating in the problem solving and reasoning processes necessary for learning via discussion or gaining such a point of view (Kiuhara et al., 2020). In addition to this study, both Nganga et al. (2020) and Avaroğulları (2015), seemed to agree to the point that the perspective on controversial issues can change as long as appropriate learning environments are provided. The direction of this change must be shifted from certain teacher models such as those who want to "privilege" (Hess, 2005) an opinion on a subject and impose it on students and those adopting the approach of "exclusive neutrality" (Kelly, 1996), based on ignoring students' questions and controversial issues, and avoiding such situations, towards such teacher models as those with "risk-taking" (Kitson & McCully, 2005) attitude, who care about controversial issues and focus on them with various methods and techniques. The reason for this is that risk-taking teachers will be capable of shaping many skills necessary for the 21st century through teaching controversial issues (Öntaş et al., 2021).

The inclusion of controversial issues in a planned and programmed way in a classroom enviroment provides important educational gains (Yazıcı & Seçgin, 2010), as clearly indicated in our study. The prospective social studies teachers interviewed, speaking from their own experiences about the pedagogical gains resulting from exposure to controversial issues, explained that such issues have multidimensional effects, i.e., developing a sense of curiosity, respect for other opinions, critical thinking, problem solving, and reasoning, as well as securing self-confidence. This result seems to have parallel features with the results of many research studies conducted in the literature (Baki-Pala, 2020; Baloğlu-Uğurlu & Doğan, 2016; Cannard, 2005; Çepni & Geçit, 2020; Dearden, 1981; Demircioğlu, 2016; Ersoy, 2013; Harwood & Hahn, 1990; Hess, 2005; Tunç-Şahin, 2021). Given the causes of the desired outcome, it appears that using argumentative writing as a problem-solving process that requires self-regulation to achieve a persuasive goal is an important supporting factor (Graham & Harris, 1997), This is because the nature of controversial issues requires higher-order thinking skills. As an essential tool to reveal these skills, argumentative writing offers students a more qualified learning experience by providing opportunities such as thinking, reasoning, and focusing on the subject (Chen, Benus & Hernandez, 2019). In this regard, Murtadho (2021) states that practices grounded on metacognition and critical thinking affect students' argumentative writing skills. From this standpoint, it can be assumed that controversial issues built on higher-order thinking skills are also effective in developing students' argumentative writing skills.

As an example of research showing the impact ot controversial issues on learners, Pace (2021) has studied the nature of controversial issues, and stated that students should research on controversial issues, master the concepts on both sides of an issue, and develop their perspective, and that examining such issues enables to make a critical analysis of sources, discuss different perspectives, and adopt a standpoint by elaborating on important questions. Since such practice motivates students to do research from reliable sources (Setyowati et al., 2017), it also supports the purpose of argumentative writing, which is a source of inspiration for students in order for them to develop their knowledge and construct arguments upon collecting, combining, and evaluating evidence (Murtadho, 2021). Similarly, Lockwood (1996) found that controversial issues can allow students to gain perspectives and knowledge in areas such as developing a democratic viewpoint, listening to and understanding opposing views, discovering and finding solutions to problems, evaluating multiple views and understanding different perspectives, and applying what they learn more effectively. Strauss and Westlund (2005), who approached controversial issues from a different perspective, emphasized that exposure of students to various perspectives while handling controversial issues can provide an opportunity for the development of their social, moral and

cultural attitudes and skills. Misco (2012), on the other hand, pointed out that being engaged in controversial issues increases one's interest in current events, social sciences and social issues, thereby developing tolerance. Moreover, presenting such topics in appropriate learning environments by relating them to real life when teaching controversial topics (Çopur & Demirel, 2016) provides students with the ability to acquire, evaluate, and question knowledge (Stradling, 1984), the ability to think critically and make decisions (Abu-Hamdar & Khader, 2014), the development of attitudes and behaviours based on respect between individuals (Öntaş et al., 2021), and the acquisition of a culture of coexistence (Deniz, 2018). Considering the available research on controversial issues and this study as a whole, it is found that controversial issues play a crucial role in students developing higher order thinking skills and acquiring knowledge. Furthermore, the relevant literature and this study agree that controversial issues play a key role in overcoming both individual and societal problems.

Given the nature of controversial issues, the effective aspects of argumentative writing, and the findings and results of the present study, a number of suggestions can be listed:

- Educators who want to create a democratic classroom climate through controversial issues can integrate argumentative writing into their lessons.
- The sample of this study consists of prospective social studies teachers. Further studies could be conducted with other sample groups.
- This study focused on brain migration, technology, nuclear energy, and different styles of government. In future research, similar studies can be conducted on different controversial topics.

Author (s) Contribution Rate

The authors contributed equally at all stages of the research.

Conflicts of Interest

The authors declared no potential conflicts of interest regarding the research, authorship or publication on this article.

Ethical Approval

Ethical permission 21/10/2021- 22 was obtained from Atatürk University Educational Sciences Ethics Committee for this research.

References

Abu-Hamdan, T. & Khader, F. (2014). Social studies teachers' perceptions on teaching contemporary controversial issues. *American International Journal of Contemporary Research*, *4*(10), 70-78.

Aguirre-Mendez, C., Chen, Y. C., Terada, T. & Techawitthayachinda, R. (2020). Predicting components of argumentative writing and achievement gains in a general chemistry course for nonmajor college students. *Journal of Chemical Education*, *97*(8), 2045-2056. doi.org/10.1021/acs.jchemed.0c00042

Alagöz, B. (2014). Developing a controversial issues scale toward social studies teacher candidates: The study of validity and reliability. *Gaziantep University Journal of Social Sciences*, *13*(3), 735-766.

Allison, M. Kroesch, Katherine N. Peeples, Courtney L. Pleasant & Yojanna Cuenca-Carlino (2021). Let's argue: developing argumentative writing skills for students with learning disabilities, *Reading & Writing Quarterly*, Doi: 10.1080/10573569.2021.1970659

Anggraeny, E. & Putra, J. R. (2017). Critical thinking in students' Process of writing the argumentative essay. *Journal of English Language Learning*, *1*(1), 92-108.

Apter, E. J. (2016*). Current controversial issues in history classrooms: Two high school teachers' practices and views* (Unpublished Doctoral Dissertation). Fordham University. ABD.

Arroyo, R., Fernández-Lancho, E. & Martínez E. (2021). Digital Competence in Learning Written Academic Argumentation, *IEEE Revista Iberoamericana de Tecnologias del Aprendizaje*, *16*(1), 115-121, Doi: 10.1109/RITA.2021.3052678.

Avaroğulları, M. (2015). An Action research regarding controversial issues ın social studies instruction. E-Journal of New World Sciences Academy,10(2), 139-150. Doi:10.12739/NWSA.2015.10.2.1C0638

Aynuz, A. (2020). *The percetions, attitudes and opinions of teacher candidates of social studies towards teaching controversial topics* (Master Thesis). Bolu Abant İzzet Baysal University, Bolu.

Baki-Pala, Ç. (2020). *Exploring controversial and sensitive issues in the context of social studies educatıon: An action research*. (Unpublished Doctoral Distertation). Marmara University, İstanbul.

Baloğlu-Uğurlu, N. & Doğan, A. (2016). Social studies teacher candidates' and academicians' opinions about teaching of controversial ıssues, *Inönü University Journal of the Faculty of Education*, *17*(3), 219-237. Doi: 10.17679/inuefd.17327087

Bangert-Drowns, R. L., Hurley, M. M. & Wilkinson, B. (2004). The effects of school-based writing-to-learn interventions on academic achievement: A meta-analysis. *Review of Educational Research, 74*(1), 29-58. Doi:10.3102/00346543074001029

Byford, J., Lennon, S. & Russell, W. B. (2009). Teaching controversial issues in the social studies: A research study of high school teachers. *The Clearing House: A Journal of Educational Strategies, Issues and Ideas*, *82*(4), 165-170.

Campbell, Y. C. & Filimon, C. (2018). Supporting the argumentative writing of students in linguistically diverse classrooms: An action research study. *RMLE Online*, *41*(1), 1-10.

Can, A. (2017). *SPPS ile bilimsel araştırma sürecinde nicel veri analizi* (5. Baskı). Ankara: Pegem Akademi

Cannard, K. (2005). Embracing Controversy in the Classroom. *Science Scope*, *28*(8), 14-17.

Chen, Y. C., Benus, M. J., & Hernandez, J. (2019). Managing uncertainty in scientific argumentation. *Science Education*, *103*(5), 1235-1276.

Chinn, C. A. (2006). Learning to argue. *Collaborative Learning, Reasoning, and Technology*, 355-383.

Copur, A. & Demirel, M. (2016). Turkish social studies teachers' thoughts about the teaching of controversial issues. *JSSE-Journal of Social Science Education*, *15*(2), 80-95.

Cotton, D. R. (2006). Teaching controversial environmental issues: Neutrality and balance in the reality of the classroom. *Educational research*, *48*(2), 223-241. Doi: 10.1080/00131880600732306

Creswell, J. W. (2017). *Karma yöntem araştırmalarına giriş* (M. Sözbilir, Çev. Ed.). Ankara: Pegem Akademi.

Creswell, J.W. & Plano-Clark, V.L. (2007). *Designing and conducting: Mixed methods research.* Thousand Oaks, California: Sage Publication.

Çepni, Z. & Geçit, Y. (2020). Social studies teacher candidates' attitudes and views regarding socio-scientific issues. *International Journal of Geography and Geography Education (IGGE), 42,* 133-154.

Dearden, R. F. (1981). Controversial issues and the curriculum. *Journal of Curriculum Studies*, *13*(1), 37-44. Doi: 10.1080/0022027810130105

Demircioğlu, İ. H. (2016). Using controversial issues in history lessons: Views of Turkish history teachers. *Kastamonu Eğitim Dergisi*, *24*(1), 147-162.

Deniz, S. (2018). *Teachers' opınıons on whether controversıal ıssues are ıncluded ın currıculum of elementary schools* (Unpublished Master Thesis). Inonu University, Malatya.

Dewhurst, D. W. (1992). The teaching of controversial issues. *Journal of Philosophy of Education*, *26*(2), 153-163.

Diaz, C. R. (2017). *Assessing the Impact of 6+ 1 Traits® of Writing on Improving Argumentative Writing Skills of Fifth Grade Students* (Unpublished Doctoral Dissertation). University of South Alabama.

Dingler, M. (2017). Arguing for democracy: A multimodal approach to argumentative writing instruction in the social studies classroom. *The Social Studies, 108*(3), 111-119.

Drid, T. (2014). Exploring the use of through-argumentation and counter-argumentation in Arabic-Speaking EFL learners' argumentative essays. *Arab World English Journal, 5*(4).

Driver, R., Newton, P. & Osborne, J. (2000). Establishing the norms of scientific argumentation in classrooms. *Science Education, 84*(3), 287-312.

Duschl, R., Ellenbogen, K. & Erduran, S. (1999). Understanding dialogic argumentation among middle school science students. Paper presented at the annual meeting of the American Educational Research Association, Montreal.

Dynneson, T. L. & Gross, R. E. (1985). An eclectic approach to citizenship: Developmental stages. *The Social Studies*, *76*(1), 23-27.

Ebadi, S. & Rahimi, M. (2018). An exploration into the impact of WebQuest-based classroom on EFL learners' critical thinking and academic writing skills: a mixed-methods study. *Computer Assisted Language Learning*, 31:5-6, 617-651, Doi: 10.1080/09588221.2018.1449757

Ersoy, F. (2013). Factors affecting the participation of social studies teacher candidates in discussions on controversial ıssues. *Journal of Social Studies Education Research, 4*(1), 24-48.

Fakhruddin, M. & Soekardjo, M. (2021). The Dilemma of teachers in teaching controversial ıssues of ındonesian history. In *First International Conference on Science, Technology, Engineering and Industrial Revolution (ICSTEIR 2020)* (pp. 619-622). Atlantis Press.

Fan, C. Y. & Chen, G. D. (2021). A scaffolding tool to assist learners in argumentative writing. *Computer Assisted Language Learning*, *34*(1-2), 159-183.

Ferretti, R. P. & Fan, Y. (2016). Argumentative writing. In C. A. MacArthur, S. Graham, & J. Fitzgerald (Eds.), *Handbook of writing research* (pp. 301–315). The Guilford Press.

Ferretti, R. P. & Lewis, W. E. (2013). Best practices in teaching argumentative writing. *Best Practices in Writing Instruction*, *2*, 113-140.

Ferretti, R. P. Lewis, W. E. & Andrews-Weckerly, S. (2009). Do goals affect the structure of students' argumentative writing strategies?. *Journal of Educational Psychology*, *101*(3), 577-589.

Ferretti, R. P. & Graham, S. (2019). Argumentative writing: Theory, assessment, and instruction. *Reading and writing*, *32*, 1345–1357 doi.org/10.1007/s11145-019-09950-x

Fisher, A. (2013). *Critical Thinking: An introduction* (second edition). Cambridge University Press Education.

Fraenkel, J. R., Wallen, N. E., & Hyun, H. H. (2012). *How to design and evaluate research in education* (8th ed.). New York: McGraw-Hill.

Gleason, M. M. (1999). The role of evidence in argumentative writing, *Reading & Writing Quarterly*, *15*(1), 81-106, Doi: 10.1080/105735699278305

Graham, S. & Harris, K. R. (1997). It can be taught, but it does not develop naturally: Myths and realities in writing instruction. *School Psychology Review*, *26*(3), 414-424.

Graham, S. (2018). A revised writer (s)-within-community model of writing. *Educational Psychologist*, *53*(4), 258-279.

Graham, S., Gillespie, A. & McKeown, D. (2013). Writing: Importance, development, and instruction. *Reading and Writing*, *26*(1), 1-15.

Green, S. B. & Salkind, N. J. (2005). *Using Spss for windows and macintosh: Analyzing and understanding data.* Upper Saddle River, New Jersey 07458.

Günal, H. & Kaya, R. (2016). Problems and drawbacks that hıstory teachers experıence whıle teachıng controversıal and sensıtıve ıssues (Erzurum sample). *Turkish History Education Journal, 5*(1), 44-73.

Hand, M. & Levinson, R. (2012). Discussing controversial issues in the classroom. *Educational Philosophy and Theory*, *44*(6), 614-629. Doi: 10.1111/j.1469-5812.2010.00732.x

Harwood, A. M. & Hahn, C. L. (1990). *Controversial issues in the classroom*. Bloomington, IN: ERIC Clearinghouse for Social Studies/Social Science Education.

Hedley, M. & Markowitz, L. (2001). Avoiding moral dichotomies: Teaching controversial topics to resistant students. *Teaching Sociology*, 195-208.

Hess, D. (2005). How do teachers' political views influence teaching about controversial issues. *Social Education*, *69*(1), 47-48.

Hess, D. E. (2002). Discussing controversial public issues in secondary social studies classrooms: Learning from skilled teachers. *Theory & Research in Social Education*, *30*(1), 10-41. Doi:10.1080/009331 04.2002.10473177

Jin, T., Su, Y. & Lei, J. (2020). Exploring the blended learning design for argumentative writing. *Language Learning & Technology*, *24*(2), 23–34. http://hdl.handle.net/10125/44720

Johnson, D. W., Johnson, R. T. & Smith, K. A. (2000). Constructive controversy: The educative power of intellectual conflict. *Change: The Magazine of Higher Learning*, *32*(1), 28-37. Doi: 10.1080/00 091380009602706

Kelly, T. E. (1986). Discussing controversial issues: Four perspectives on the teacher's role. *Theory & Research in Social Education*, *14*(2), 113-138.

Kitson, A. & McCully, A. (2005). 'You hear about it for real in school.'Avoiding, containing and risk-taking in the history classroom. *Teaching History*, (120), 32-37.

Kiuhara, S. A., Gillespie Rouse, A., Dai, T., Witzel, B. S., Morphy, P. & Unker, B. (2020). Constructing written arguments to develop fraction knowledge. *Journal of Educational Psychology*, *112*(3), 584.

Koh, Y. C. (2004). *The impact of scaffolding via online asynchronous discussions on students' thinking skills in writing argumentative essays* (Unpublished Doctoral Dissertation). Nanyang Technological University, Singapore.

Kuhn, D. (2005). *Education for thinking*. Cambridge, MA: Harvard University Press.

Latifi, S., Noroozi O., Hatami J. &. Biemans, H. J. A (2021). How does online peer feedback improve argumentative essay writing and learning?, *Innovations in Education and Teaching International*, *58*(2), 195-206. Doi: 10.1080/14703297.2019.1687005

Liu, F. & Stapleton, P. (2014). Counterargumentation and the cultivation of critical thinking in argumentative writing: Investigating washback from a high-stakes test. *System*, *45*, 117-128.

Lockwood, A. L. (1996). Controversial issues: The teacher's crucial role. *Social Education*, *60*(1), 28-31.

MacArthur, C. A. & Graham, S. (2016). Writing research from a cognitive perspective. In C. A. MacArthur, S. Graham, & J. Fitzgerald (Eds.), *Handbook of writing research* (pp. 24–40). The Guilford Press.

MoNE, (2018). Milli Eğitim Bakanlığı, 4.5.6.7. Sosyal Bilgiler Öğretim Programı [4.5.6.7. Social Studies Curriculum.]. https://mufredat.meb.gov.tr/

Merriam, S. B. (2013). *Oualitative research: A guide to design and implementation.* (S. Turan çev. ed.). Ankara: Nobel Akademik Yayıncılık.

Miles, M. B., & Huberman, A. M. (2016). *Qualitative data analysis* (S. Akbaba, A. A. Ersoy, çev. ed.). Ankara: Pegem Akademi.

Misco, T. (2012). The importance of context for teaching controversial issues in international settings. *International Education*, *42*(1), 69-84.

Morse, J. M. (1991). Approaches to qualitative- quantitative methodological triangulation. *Nursing Research,* 40, 120-123.

Murtadho, F. (2021). Metacognitive and critical thinking practices in developing EFL Students' Argumentative writing skills. *Indenosian Journal of Applied Linguistics,* 10(3), 656-666. Doi:10.17509/ijal .v10i3.31752,

National Council for Social Studies (NCSS). (2016). Academic freedom and the social studies educator. *Social Education,* 80(3), 186.Retrieved from https://www.socialstudies.org/social-education/80/03/ academic-freedom-and-social-studies-teacher

Negari, G. M. (2011). A study on strategy instruction and EFL learners' writing skill. *International Journal of English Linguistics*, *1*(2), 299.

Nganga, L., Roberts, A., Kambutu, J. & James, J. (2020). Examining pre-service teachers' preparedness and perceptions about teaching controversial issues in social studies. *The Journal of Social Studies Research*, *44*(1), 77-90.

Nippold, M. A. & Ward-Lonergan, J. M. (2010). Argumentative writing in pre-adolescents: The role of verbal reasoning. *Child Language Teaching and Therapy*, 26(3), 238–248. Doi:10.1177/0265659009349979

Nippold, M. A. Ward-Lonergan, J. M. & Fanning, J. L. (2005). Persuasive writing in children, adolescents, and adults: A study of syntactic, semantic, and pragmatic development. *Language, Speach, and Hearing Services in Schools, 36*(2), 125–138.

Olsen, A. W., VanDerHeide, J., Goff, B. & Dunn, M. B. (2018). Examining intertextual connections in written arguments: A study of student writing as social participation and response. *Written Communication*, *35*(1), 58-88. Doi:10.1177%2F0741088317739557

Oulton, C., Dillon, J., & Grace, M. M. (2004). Reconceptualizing the teaching of controversial issues. *International Journal of Science Education, 26*(4), 411-423.

Öntaş, T., Yıldırım, E., Egüz, Ş., & Kaya, B. (2021). Reflections of teaching of controversial topics to the field of classroom education. *Education and Science, 46*(205) 161-189. Doi: 10.15390/EB.2020.9104

Öztürk, D., & Kus, Z. (2019). Social studies teachers' opinions and practices regarding teaching controversial issues. *Australian Journal of Teacher Education (Online)*, *44*(8), 15-37.

Öztürk, D. (2017). *Social studies teachers' views and practices on teaching of controversial issues* (Unpublished Doctoral Distertation). Kastamonu University, Kastamonu.

Pace, J. L. (2021). *Hard questions: Learning to teach controversial issues*. Rowman & Littlefield Publishers.

Pallant, J. (2005). *SPSS survival manual: A step by guide to data analysis using spss for windows* (2nd ed.). National Library of Australia.

Pei, Z., Zheng, C., Zhang, M. & Liu, F. (2017). Critical thinking and argumentative writing: Inspecting the association among EFL learners in China. *English Language Teaching*, *10*(10), 31-42

Philpott, S., Clabough, J., McConkey, L. & Turner, T. N. (2011). Controversial issues: To teach or not to teach? That is the question. *The Georgia Social Studies Journal*, *1*(1), 32-44.

Rambosk, P. (2011). *Florida pre-service teachers' and their attitudes towards the use of controversial issues* (Unpublished Doctoral Dissertation). Florida State University. ABD.

Rossi, J. A. (2006). The dialogue of democracy. *The Social Studies, 97*(3), 112-120. Doi: 10.3200/TSSS .97.3.112-120

Salminen, T., Marttunen, M. & Laurinen, L. (2010). Visualising knowledge from chat debates in argument diagrams. *Journal of Computer Assisted Learning*, *26*(5), 379–391. Doi:10.1111/j.1365-2729. 2010.00354.x

Seçgin, f. (2009). *The teacher candidates?,perception, attitude and ideas about teaching the controversial issues* (Master Thesis). Gaziosmanpaşa Univesity, Tokat.

Setyowati, L., Sukmawa, S. & Latief, M. A. (2017). Solving the students' problems in writing argumentative essay through the provision of planning. Celt: *A Journal of Culture, English Language Teaching & Literature*, 17(1), 86- 102. Doi:10.24167/celt.v17i1.1140

Soley, M. (1996). If it's controversial, why teach it?. *Social Education*, *60*, 9-14.

Stradling, R. (1984). The teaching of controversial issues: an evaluation. *Educational review*, *36*(2), 121-129. Doi: 10.1080/0013191840360202

Tabachnick, B. G. & Fidell, L. S. (2015). *Çok değişkenli istatistiklerin kullanımı* (M. Baloğlu, Çev. Ed.). Ankara: Nobel.

Tatar, Ş. (2019). An investigation of dissertations on controversial and socioscientific ıssues in Turkey from the perspective of educational sciences. *Eskişehir Osmangazi University Journal of Social Sciences, 20*(Special Issue), 1-21. Doi: 10.17494/ogusbd.

Toulmin, S. E. (2003). *The uses of argument*. Cambridge University Press.

Tuncer, H. (2018). *Examining social studies teacher candidates' opinions about teaching controversial subjects* (Unpublished Master Thesis). Fırat University, Elazığ.

Tunç-Şahin, C. (2021). Teaching social issues in social studies education. *Ahi Evran University Journal of Kırşehir Education Faculty, 22*(3), 1429-1474. Doi: 10.29299/kefad.919950

UNESCO (2016). Education in Thailand: An OECD-UNESCO Perspective, Reviews of National Policies for Education, OECD Publishing, Paris. http://dx.doi.org/10.1787/9789264259119-en

Uygun, K. & Arslan, I. E. (2020). Students' opinions about teaching of the controversial topics in the social studies classes. *International Journal of Evaluation and Research in Education*, *9*(2), 335-344. Doi: 10.11591 /ijere.v9i2.20446

Vorobej, M. (2006). *A theory of argument*. Cambridge University Press.

Yazıcı, S. & Seçgin, F. (2010). A study on teaching controversial issues**.** *Journal of International Social Research*, *3*(12), 488-501.

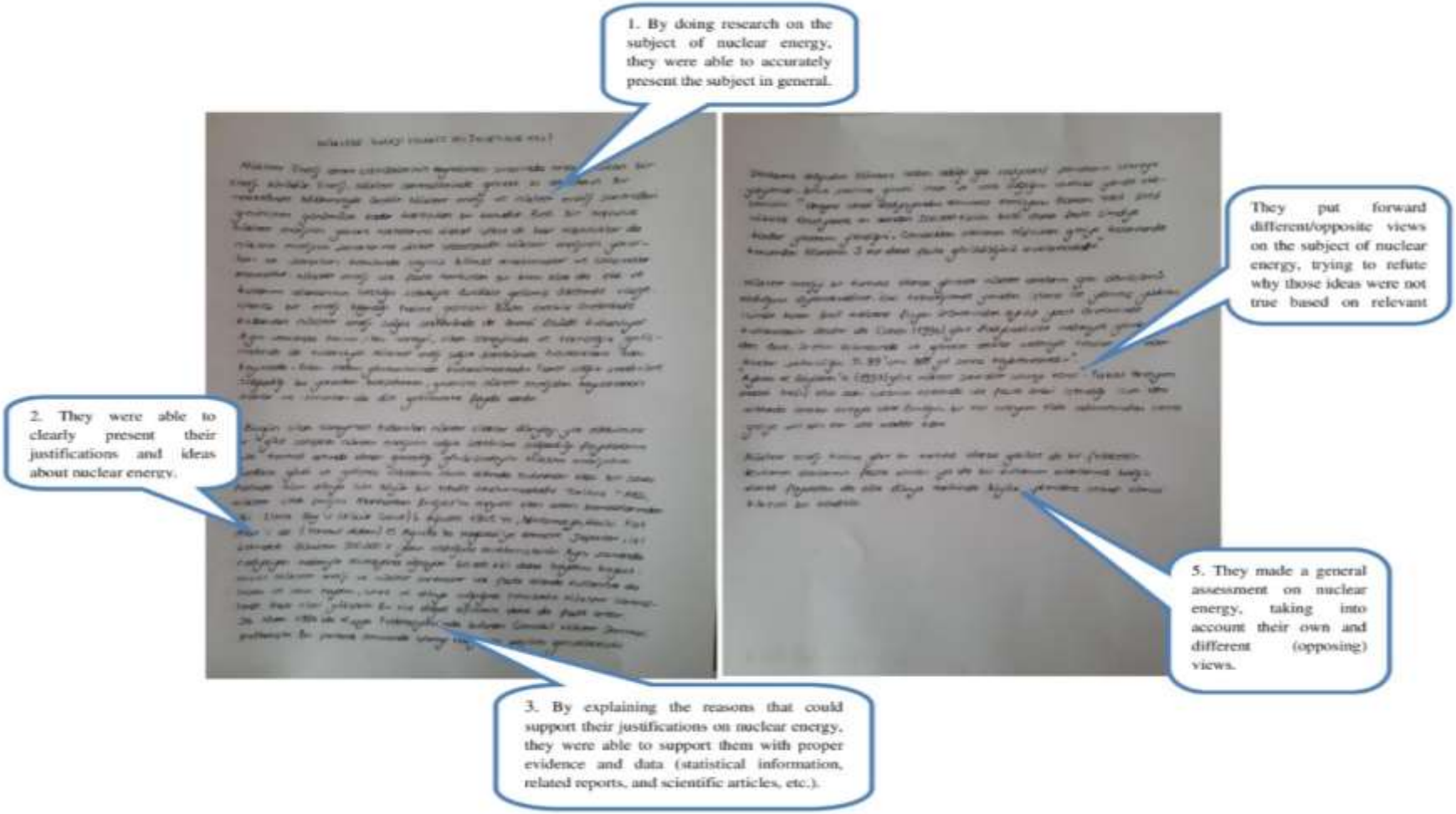
Yıldırım, A., Şimşek H. (2016). *Sosyal bilimlerde nitel araştırma yöntemleri*. Ankara: Seçkin Yayınevi.

Yılmaz, K. (2012). Investigation into controversial issues and taboo topıcs: Social studies teachers' perspectives, *Mustafa Kemal University Journal of Social Sciences Institute, 9*(18), 201-225.

Yücel, A.G. (2018). *The effect of controversial issues on the development of social studies teacher candidates' critical thinking levels* (Unpublished Master Thesis). Nevşehir Hacı Bektaş Veli University, Nevşehir.

Zohar, A. & Nemet, F. (2002). "Fostering students" knowledge and argumentation skills through dilemmas in human genetics. *Journal of Research in Science Teaching*, *39*(1), 35-62.

Appendix 1. A Sample Work of the Student


1. By doing research on the subject of nuclear energy, they were able to accurately present the subject in general.
2. They were able to clearly present their justifications and ideas about nuclear energy.
3. By explaining the reasons that could support their justifications on nuclear energy, they were able to support them with proper evidence and data (statistical information, related reports, and scientific articles, etc.).
They put forward different/opposite views on the subject of nuclear energy, trying to refute why those ideas were not true based on relevant
5. They made a general assessment on nuclear energy, taking into account their own and different (opposing) views.

Article History
Received: 21.11.2021
Received in revised form: 16.02.2022
Accepted: 26.02.2022
Article Type: Research Article

International Journal of Contemporary Educational Research (IJCER)

www.ijcer.net

The Effect of Psychoeducation Program Based on Structural Family System Therapy on Family Functionality in Families of a Child Diagnosed with Attention Deficit Hyperactivity Disorder

Gülşah Tura[1],
[1]Kocaeli University, 0000-0002-0611-7993

To cite this article:

Tura, G. (2022). The Effect of Psychoeducation Program Based on Structural Family System Therapy on Family Functionality in Families of a Child Diagnosed with Attention Deficit Hyperactivity Disorder. *International Journal of Contemporary Educational Research*, *9*(1), 164-178. https://doi.org/10.33200/ijcer.1026579

International Journal of Contemporary Educational Research
Volume 9, Number 1, March 2022, 164-178 ISSN: 2148-3868

The Effect of Psychoeducation Program Based on Structural Family System Therapy on Family Functionality in Families of a Child Diagnosed with Attention Deficit Hyperactivity Disorder*

Gülşah Tura[1**]
[1]Kocaeli University

Abstract

The main objective of the present study was to investigate the effect of a Structural Family Therapy (SFT)-based psychoeducation program on family functioning in families of children with attention deficit hyperactivity disorder (ADHD). This study was an experimental study based on the pre-test, post-test, and follow-up test model, with experimental and control groups. Family functionality, which was the study's dependent variable, was measured with the Mc Master Family Assessment Device (FAD). The independent variable of the research was the psychoeducation program applied only to the experimental group. The research consisted of parents who have children between 7-10 years of age diagnosed with ADHD. An 11-week psychoeducation program developed by the researcher based on SFT was offered to the experimental group. Mann-Whitney U and Wilcoxon Signed-Rank tests were used to analyze the data. The results obtained from the study found out a significant difference ($p<.05$) between the post-test scores of the control and experimental group. In addition, a significant difference ($p <.05$) was found between the FAD scores of the parents in the experimental group before and after the experiment. The results show that the SFT-based psychoeducation program for parents is effective in increasing family functionality.

Keywords: Family, Family functionality, System, Psychoeducation, ADHD

Introduction

Family institution, which can meet almost all the needs of human beings, which is a biopsychosocial being, has vital importance in the development of individuals. Gladding (2014) drew attention to the biological and psychological bond between the members and defined the family as the unity of individuals who have emotional, historical, and economic unity among themselves and who feel like members of the same house. The family, which has the characteristics of a social laboratory, on the one hand, offers rich resources that support the development of its members; on the other hand, it has to deal with conflicts that will hinder the development of its members.

Since families face life stressors, theories and models related to family counseling and psychology have gradually increased. One of the family counseling theories, Salvador Minuchin's Structural Family Therapy (SFT), is one of the leading theories that examines family relationships and the effects of these relationships on psychopathology and proposes a treatment model (Minuchin, 1974). According to Minuchin, based on General Systems Theory (Bertalanffy), families are systems that function with transactional patterns (Minuchin, 1974; Nichols, 2013). Each family creates its subsystems about the number of members it has. Concepts such as closeness, hierarchy, boundaries, and flexibility in Minuchin's theory are accepted as basic parameters in family counseling (understanding and treating various psychological problems). Cohesion includes how many family members see each other together and as a whole (Minuchin, 1974). The level of closeness in the family is shaped by the effectiveness of the communication between the members. When the unity among the members is evaluated on one dimension, one of the ends shows a low (disengaged) and the other a high (enmeshed) level. Functional families are in balance between two extremes in terms of proximity (Colapinto, 2019; Gladding, 2014). Hierarchy, which is expressed with concepts such as one member's influence over the other, authority,

* This study was supported by Kocaeli University Scientific Research Projects Coordination Unit. Project Number: SBA-2020-2063.
** Corresponding Author: *Gülşah Tura, gulsah.tura@kocaeli.edu.tr*

and dominance in the family, refers to the ability to determine the relations and rules in the family system (Aponte & Van Deusen, 1981; Chappelle & Tadros, 2021). In functional families, parents can effectively use the authority they have created in cooperation for the healthy development of children and can provide behavioral control. The hierarchical structure differs in troubled families. While children with conduct disorder reject parental authority, they may have more power than their parents due to the inverted hierarchy (Anderson & Gavazzi, 1990; Colapinto, 1979; Gehring & Feldman, 1988; Wetchler & Hecker, 2014). Boundaries, which protect family integrity and are a kind of emotional barrier, regulate the interaction between subsystems by managing closeness and hierarchy in the family (Minuchin, 1974). In open and flexible boundaries that support the family's functionality, members can share their feelings and thoughts using effective communication skills (Tura, 2020). The flexibility of the borders and the family system contributes to the healthy management of the family's situational and developmental changes and supports problem-solving skills. Low flexibility indicates resistance to change and authority, while high flexibility indicates an uncontrolled and chaotic structure in the family (Minuchin, 1974). In summary, according to SFT, functional families are healthy families who can fulfill the tasks expected of them. Relationships between members, family roles, boundaries, rules, and behavior patterns are healthy and the development of members is supported in the family.

The presence of a member with a developmental disorder in the family may negatively affect the family system, and whether the system is healthy can affect the development and treatment of the member with this disorder in many ways (Johnston & Mash, 2001). Attention deficit hyperactivity disorder (ADHD) is one of the most widespread childhood neurodevelopmental disorders characterized by heterogeneous symptoms such as inattention, impulsivity, and hyperactivity (Morris et al., 2020). The presence of a child with ADHD can create serious problems in the family system (Hetchman, 1981), and may adversely affect the parent-child relationship, especially in childhood (Epstein et al., 1983). In studies conducted with families of children with ADHD, high family stress (Norvilitis et al., 2002; Rogers et al., 2009) and low family functionality were detected (Börekçi, 2017; Churchill et al., 2018; Gökçen et al., 2011; Malkoff et al., 2011; Margari et al., 2013; Özyurt et al., 2015; Penuelas-Calvo et al., 2021; Scahill et al., 1999; Soysal et al., 2013; Uran & Kılıç, 2020). In the treatment of ADHD symptoms, the application of psychotherapy and psychosocial methods that include the family system as well as drug therapy prevents the child and other members from developing more serious problems (Aman, 2000; Hoza et al., 2000; Satterfield et al., 1987). In addition, there is a relationship between the level of family functions and the child's symptoms with ADHD (Breaux & Harvey, 2019; Cussen et al., 2012; Horn et al., 1987). In their study, Matos et al. (2009) observed a decrease in hyperactivity and inattention and an increase in effective parenting skills as a result of parent-child interaction therapy. In another study examining three different family therapy programs using behavior management training, problem-solving and communication training, and SFT, all three approaches were found to reduce family conflict and intensity of anger at the time of conflict in parents of a child with ADHD (Barkley et al., 1992). Studies conducted with families of children with different problematic behaviors showed that STF improved family functionality and integrity (Perosa & Perosa, 1981; Szapocznik et al., 1989).

When all these data are evaluated, the effects of physical, emotional, and social problems that a child with ADHD, a neurodevelopmental disorder, may experience, first manifests themselves in the family system, and disorders in the system may trigger the child's symptoms. Considering that psychoeducation programs are practices designed to improve the quality of life of family members and their ability to cope with problems (Jones & Passey, 2004), the psychoeducation program to be given to the parents of a child with ADHD will pave the way to regulating dysfunctional family relationships and to a healthy family system. From this point of view, the main objective of the study was to investigate the effectiveness of the psychoeducation program developed on the basis of SFT to increase family functioning in parents with ADHD children. To achieve this goal, the following hypotheses were made:

1. The FAD post-test scores of the parents who received the SFT-based psychoeducation program were significantly lower than the parents who did not receive this education.
2. The post-test scores of parents who received SFT-based psychoeducation programs were lower than pre-test score distributions.
3. There is no significant difference between the FAD post-test scores of parents with the SFT-based psychoeducation program and the FAD follow-up test scores applied eight weeks later.

Method

Research Model

A quantitative research method was applied to examine the effect of STF-based psychoeducation programs on family functioning in families of ADHD children. The study used pre-test, post-test, and follow-up test control group design, which is one of the quasi-experimental methods. Subjects were matched in terms of demographic characteristics, and they were divided into two as experimental and control groups with the neutral assignment (Büyüköztürk et al., 2020). The study's independent variable was the STF-based psychoeducation program applied only to the parents in the experimental group, and the dependent variable was family functions.

Study Group

The present study's findings were obtained from parents of children with ADHD who were registered at the Counseling and Research Center and Special Education and Rehabilitation Center in Kocaeli city. The volunteer parents were determined with the preliminary information given to the parents. The parents included in the study were 109 parents, 72 females and 37 males, who had children between 7-10 years of age diagnosed with ADHD. For the group to have similar characteristics, the parent who participated in the psychoeducation must live in the same house with their spouse and child, and must not have attended any family training before or at present. In addition, the child's not having any comorbidity other than ADHD and continuing drug therapy for at least two months were determined as the criteria for participation in the study. First of all, the needs analysis form created to prepare the psychoeducation program was sent to the parents of children with ADHD (N=109) via the Google form. Based on the data obtained from the form, the program was prepared and parents were called by telephone and invited to the special education center to advertise the program. After the information meeting about the prepared psychoeducation program was held, the parents who met the research criteria and volunteered for the study were determined. A total of 40 parents, 20 of whom were in the experimental group and 20 in the control group, who were determined through unbiased assignment, formed the research study group. Both groups consisted of 20 people, 12 (60%) female and 8 (40%) male. Five of the parents in the experimental group graduated from secondary school, seven graduated from high school and eight graduated from university. Six of the parents in the control group were secondary school graduates, seven of them were high school graduates and seven were university graduates. There was no comorbidity or developmental diagnosis in the children of all parents in both groups. The mean age of the participants was 37.

Data Collection Tool

Mc Master Family Assessment Device (FAD)

Mc Master Family Assessment Device was developed by Epstein, Baldwin, and Bishop (1983) to determine which items of family functions could not be fulfilled. It was adapted into Turkish by Bulut (1990). The scale, which consisted of 60 items, included family functions such as "general functioning" (12 items), "roles" (11 items), "behavior control" (9 items), "communication" (9 items), "affective involvement" (7 items), "affective responsiveness" (6 items) and "problem solving" (6 items). The lowest score taken from the scale was 60, and the highest score was 240. High scores obtained from the scale indicated unhealthy family functionality. Items in the scale, which can be applied to all family members over the age of 12, were answered considering the last two months (Bulut, 1990). The validity of the scale was applied to normal families (N=208) and families of psychiatric patients (N=98), and the subtest mean scores of the normal families were found to be lower than the mean scores of the families of psychiatric patients ($p<.001$) (Öner, 1994). The Cronbach's alpha coefficients for the scale's internal consistency were found .86 for general functioning, .80 for problem-solving, .71 for communication, .59 for affective responsiveness, .52 for behavior control, .42 for roles, and .38 for affective involvement.

Psychoeducation Program

Preparation of the Psychoeducation Program

To carry out the experimental study, a psychoeducation program was prepared to increase family functionality. Psychoeducation is a type of group with educational content that provides its members with coping skills for determined purposes (DeLucia-Waack, 2006; Jacobs et al., 2006). Psychoeducational groups consisting of planned and structured activities are cognitive (Kahraman & Tanrıkulu, 2019; Morgan & Hensley, 1998),

affective (Fristad et al., 1996; Ulman, 2000), and existential (Ay, 2019; Fedele et al., 2013; Pomeroy et al., 1997).

The main purpose of the STF-based psychoeducation program is to increase the family functionality of families of a child with ADHD. For this purpose, a literature review was conducted to increase family functionality. According to the review of the related literature, STF is an effective approach in reorganizing the family structure and functions in different problematic situations related to the family (Barkley et al., 1992; Gottlieb, 2013; Griffith & Griffith, 1987; Mingfei et al., 2012; Szapocznik et al., 1989; Weaver et al., 2013; Yang & Pearson, 2002; Zafra, 2017; Zhu & Peng, 2009). The psychoeducation program applied to parents is structured according to SFT.

The determination of the modules and titles of the program, which was developed to increase family functions, was carried out through a needs analysis study. The needs analysis study was carried out through a special education center after obtaining the necessary permissions from the Ministry of National Education. As a result of the review of the relevant literature, it was seen that communication, clear roles, understanding emotions, problem-solving, showing interest, parental attitudes, setting rules, and togetherness were factors related to family functioning (Alacahan, 2010; Epstein et al., 1983; Freistadt & Strohschein, 2013; Light & Trust, 2007; Morawska & Sanders, 2009; Twin, 2009; Wang & Zhou, 2015). The general information form with 12 questions, which was created by considering the results obtained from the research, was applied to the parents (N=109) via the Google form. The data obtained from the form were collected under 28 categorical themes and converted into tables showing the frequency numbers of the views and thoughts of the parents. Common and similar categorical themes were determined and these themes were re-synthesized by induction and turned into main themes. To determine the consistency of the content of the program modules created and their appropriateness in terms of scope, opinions were obtained from a total of six academicians, three of whom were from the Department of Psychological Counseling and Guidance, two from the Department of Special Education, and one from Program Development. Based on the feedback received, the psychoeducation program was updated and given its final form.

Content of the Psychoeducation Program

The SFT-based psychoeducation program lasted for 11 sessions, with one session per week for parents who have a child aged 7-10 years with ADHD. Table 1 (below) presented the topics covered during the 11 weeks. At the beginning of each session, warm-up activities were applied and each session of the previous week was summarized. Parents were given homework in certain weeks, and techniques such as question-answer, case study, and brainstorming were applied in different sessions. Sessions lasted approximately 90 minutes. *In the first session*, a meeting event was held with the parents who participated in the training. After the parents' expectations from the program were discussed, information was given about the training process and sessions. For the success of the group process, group rules were created with the participants. Parents were asked what they knew about ADHD, and after their sharing, theoretical information about ADHD was conveyed. The session was ended by taking feedback on the feelings and thoughts of the participants about the first session. *In the second session*, behavioral and family problems observed in families of children with ADHD were discussed. After sharing the most common problem from each parent, the definition of the conflict was made and the session continued with conflict resolution skills. *In the third session*, they started to talk about effective communication. For effective communication content, topics such as verbal and nonverbal messages, I-language, and full message delivery were shared, and then activities for each skill were applied to the parents. At the end of the session, using the I-language was given to the parents as homework. *The fourth session* started with the sharing and evaluation of the homework given in the previous week. The role of parents in the family was studied using methods such as question-answer, discussion, and brainstorming, and then the topic of parental attitudes was taught to the parents. An application on the influence of parents in creating an effective parental subsystem was conducted and the activity was evaluated in the last session. *In the fifth session*, clear, unclear, and strict boundaries between family members were explained with examples. The importance and effect of the democratic attitude in the formation of a clear family boundary were studied with question-answer and case study techniques. *The sixth session* started with the sharing of feelings within the family. Empathic response skills in healthy emotion sharing were studied through case studies involving interaction with a child with ADHD. The effect of sharing emotions on the emotional closeness of family members to each other was explained with question-answer and brainstorming techniques. At the end of the session, the sharing of emotions exercise was given to the parents as homework. *The seventh session* started with the evaluation of homework. Then, the topic of spending time together as a family was shared. Common activities inside and outside the house, members' participation in these activities, child's behavior and expectations were explained through case studies, discussions and question and answer methods. Observation of common items was assigned as

homework. The eighth session began with the evaluation of homework. Then, the role of parents in setting the rules in the family was addressed and the difficulties in setting the rules for the child were shared. Practices were carried out for the parents to create healthy and flexible authority. An environment for evaluation and discussion on the subject has been created. *In the ninth session*, the issue of coalitions and triangulations within the unhealthy groupings within the family was explained in various ways. The effects of these groupings on family cohesion were explained and the topic was discussed with the participation of the members. The importance of the subject was emphasized by giving examples of healthy associations between members. *In the tenth session*, the influence of parents on the child's behavior was discussed. Studies on determination, consistency, appropriate language, and flexibility in behavior control were conducted through case studies of ADHD. In the eleventh session, the termination activity was applied. It was ensured that the participating parents and the leader shared their feelings and thoughts about the training process. The psychoeducation process was ended by sharing the information about the follow-up study to be carried out eight weeks later.

Table 1. Topics of the Psychoeducation Program by Session

Sessions	Topics	Sessions	Topics
1st Session	Introduction/Group Rules/ADHD/Theoretical Information	6th Session	Sharing Emotions and Emotional Intimacy
2nd Session	Problems and Conflict Resolutions in Family	7th Session	Spending Time together
3rd Session	Communication Skills	8th Session	Setting Rules and Power
4th Session	Parent Rules and Attitudes	9th Session	Intra-Family Groupings
5th Session	Democratic Attitudes and Limitation	10th Session	Behavior Control and Flexibility
		11th Session	Closing Meeting

Data Collection Process

The SFT-based psychoeducation program was conducted face-to-face with parents who have a child between 7-10 years of age with ADHD registered in the Counseling and Research Center and Special Education Center in Kocaeli, and volunteer to participate in the training. The psychoeducation program lasted for 11 weeks, with 90 minutes each session, once a week. The parents' contact informationparents' contact information registered to the Counseling and Research Center was reached, and a needs analysis form was sent via the Google form. In order to introduce the psychoeducation program created after the data was obtained, the parents were called by phone and invited to the Special Education Center. The voluntarily participated parents were randomly divided into experimental and control groups. The psychoeducation program was carried out within the scope of Kocaeli University Scientific Research Projects and was carried out within the project schedule. Before starting the psychoeducation, FAD was administered to the parents in two groups as a pre-test. It was seen that both groups were close to each other in terms of pre-test scores. Afterward, an STF-based psychoeducation program was applied only to the experimental group. It was stated that if they wanted to participate in the control group, the same training would be held for them in the next term. After the 11-week psychoeducation was completed, FAD was applied to all the parents in two groups as a post-test. Eight weeks after the post-test application, the FAD follow-up test was applied to the experimental group.

The explanation of the change in the dependent variables of research with the independent variable is called internal validity (Büyüköztürk et al., 2020). In the present study, some factors might threaten the internal validity of explaining the change in family functionality, which was the dependent variable, with the SFT-based psychoeducation program, which was the independent variable. Regarding these factors that pose a threat to internal validity, the following issues were taken into consideration in this study. 4 parents, matched for various demographic characteristics, were randomly divided into experimental and control groups. The creation of the matching and control group helped to purify the research as much as possible from the maturation effect. In addition, for the parents participating in the selected sample group to have similar characteristics, living in the same house with their spouse and child, not having participated in any family education before or currently, were determined as participation criteria.

Moreover, the participant's child must not have any co-diagnosis other than ADHD and must be on medication for at least 2 months. To eliminate the threat of the data collection process to internal validity, the researcher herself carried out this process. Considering that the training process took about 3 months, it was estimated that the pre-test effect could also be broken.

Data Analysis

Within the scope of the present research, SPSS 22.0 program was used to analyze the pre-test, post-test, and follow-up test data applied to the experimental and control groups. Wilcoxon Signed-Rank and Mann-Whitney U tests were for unrelated measurements because the number of research participants was small and the distribution did not show a normal distribution. The Mann-Whitney U test is a test used to identify whether the scores obtained from two unrelated samples differ significantly from each other (Büyüköztürk, 2010). Since the number of participants in two groups and the FAD scores of the participants was not normally distributed ($p<.05$), the significance of the difference between the groups was analysed with the Mann-Whitney U test. FAD within-group changes of the experimental and control groups were analysed with the Wilcoxon Signed-Rank test. This test, on the other hand, is a test used to compare data obtained from measurements made at different times from the same sample group (Büyüköztürk, 2010). The 95% confidence interval and $p<0.05$ value were considered statistically significant for the analyses.

Ethical Issues

Ethical permission of the research was obtained from the ethics committee of Kocaeli University, Institute of Social Sciences, numbered 10017888-020. In addition, permission numbered 87078259-605.01-E.15841560 was obtained from the Kocaeli Provincial Directorate of National Education to determine the parents to participate in the study and carry out the practices in the special education center.

Findings

Before the findings of the hypotheses of the research, descriptive statistics of the subscales and total scores of the groups from the FAD (Table 2 below) and the Mann-Whitney U test results of the pre-test scores of the participants (Table 3 below) were presented.

Table 2. Descriptive Analysis of FAD Subscales and Total Scores of Parents in Control and Experimental Groups

Sub-scales	Group	n	Pre-test		Post-test		Follow-up Test	
			$\bar{X}$	Ss	$\bar{X}$	Ss	$\bar{X}$	Ss
Problem Solving	Experimental	20	16.58	6.48	11.62	3.84	10.36	3.46
	Control	20	16.10	6.60	16.07	5.58	-	-
Communication	Experimental	20	24.04	7.80	17.07	5.80	16.20	5.80
	Control	20	23.42	9.27	24.06	8.78	-	-
Roles	Experimental	20	31.30	9.62	22.40	4.70	21.62	5.16
	Control	20	30.78	10.34	30.42	10.77	-	-
Affective Involvement	Experimental	20	16.82	5.40	11.20	4.96	11.06	3.98
	Control	20	15.50	5.70	16.50	5.58	-	-
Affective Responsiveness	Experimental	20	21.20	4.42	16.40	2.20	16.22	2.38
	Control	20	20.18	5.14	20.78	4.94	-	-
Behavior Control	Experimental	20	27.00	6.58	17.40	4.30	17.20	3.12
	Control	20	24.77	8.05	25.50	8.25	-	-
General Functioning	Experimental	20	34.50	11.45	18.52	9.52	17.56	6.40
	Control	20	29.92	12.92	29.70	11.17	-	-
Total Score	Experimental	20	171.44	51.75	114.61	35.32	110.22	30.03
	Control	20	160.67	58.02	163.03	55.07	-	-

*$p>0.05$

In Table 2 (above), it was seen that the subscales of the participants in the experimental group and the total pre-test mean scores decreased in the post-test. In the follow-up test, it was determined that the decrease continued relatively. There was no decrease in the pre-test and post-test scores of the parents in the control group.

At the beginning of the experimental process, the effectiveness of which was investigated, the pre-test results were compared to observe if there was a difference between the control and experimental groups. The Mann-Whitney U test was used to analyse the significance of the difference between the groups since the number of parents in two groups and the parents' FAD scores were not normally distributed ($p<.05$).

Table 3. Mann-Whitney U Test Results of FAD Subscales, Total Pre-Test Scores of the Control and Experimental Groups

Sub-scales	Group	N	Mean Rank	Sum of Ranks	U	p
Problem Solving	Experimental	20	22.60	452.00	158.00	.246
	Control	20	18.40	368.00		
Communication	Experimental	20	23.60	472.00	138.00	.092
	Control	20	17.40	348.00		
Roles	Experimental	20	21.28	425.50	184.50	.680
	Control	20	19.72	394.50		
Affective Involvement	Experimental	20	21.28	425.50	184.50	.680
	Control	20	19.72	394.50		
Affective Responsiveness	Experimental	20	21.00	420.00	182.00	.620
	Control	20	18.70	374.00		
Behavior Control	Experimental	20	20.75	415.00	152.5	.220
	Control	20	18.40	368.00		
General Functioning	Experimental	20	23.60	472.00	135	.076
	Control	20	19.00	380.00		
Total Scale	Experimental	20	20.75	415.00	195	.892
	Control	20	20.20	405.00		

*p>0.05

Table 3 (above) showed no significant difference between the FAD subscales and the total pre-test mean scores in the control and experimental groups. According to this result revealed that the family functionality levels of the parents in the two groups were equal.

The first hypothesis of the study was “FAD post-test scores of parents who received SFT-based psychoeducation program were significantly lower than the post-test scores of parents who did not receive an education." Table 4 below showed the findings related to this hypothesis.

Table 4. Mann-Whitney U Test Results of Control and Experimental Groups on FAD Subscales and Total Post-Test Scores

Sub-scales	Groups	N	Mean Rank	Sum of Ranks	U	p
Problem Solving	Experimental	20	17.21	280.0	54.00	.032*
	Control	20	23.79	410.0		
Communication	Experimental	20	16.82	274.5	50.50	.015*
	Control	20	24.18	415.5		
Roles	Experimental	20	17.39	282.5	58.50	.043*
	Control	20	23.61	407.5		
Affective Involvement	Experimental	20	16.96	276.5	52.50	.022*
	Control	20	24.04	413.5		
Affective Responsiveness	Experimental	20	17.25	280.5	56.50	.034*
	Control	20	23.75	405.0		
Behavior Control	Experimental	20	17.32	281.5	57.50	.040*
	Control	20	23.68	408.5		
General Functioning	Experimental	20	16.96	276.5	52.50	.023*
	Control	20	24.04	413.5		
Total Score	Experimental	20	16.21	266.0	42.00	.004*
	Control	20	24.79	424.0		

*p<.05

Table 4 (above) shows that there was a statistically significant difference between the SFT-based psychoeducation program and the posttest scores of participants who did not participate in the SFT-based psychoeducation program (U=42.00; p=.004). When the mean was examined, the total posttest score of the experimental group was lower than that of the control group.

When the mean rank was examined, the experimental group's post-test scores in all subscales of FAD were lower than the control group. Similar to the total score, there was also a statistically significant difference between the post-test scores of the participants in the groups in sub-scales of Problem Solving (U=54.00; p=.032), Communication (U=50.00; p=.015), Roles (U=58.50; p=.043), Affective Involvement (U=52.50; p=.022), Affective Responsiveness (U=56.50; p=.034), Behavior Control (U=57.50; p=.040), and General Functioning (U=52.50; p=.023). These findings could be interpreted as the psychoeducation program being effective in increasing family functionality. The findings obtained confirmed the research hypothesis.

The second hypothesis of the study was "The FAD post-test score distributions of the parents who applied the SFT-based psychoeducation program were lower than the pre-test score distributions." Table 5 (below) presented the Wilcoxon Signed-Rank Test findings, which were conducted to identify any difference between the experimental group's FAD subscales and total pre-test score and post-test mean scores.

Table 5. Wilcoxon Signed-Rank Test Results of Pre-test and Post-test Scores of the Experimental Group (N=20)

Sub-scales	Pre-test Post-test	n	Mean Rank	Sum of Ranks	z	p
Problem Solving	Negative Rank	13	11.65	116.50		
	Positive Rank	7	7.63	21.5	-2.116	.032*
	Equal	0	-			
Communication	Negative Rank	14	12.20	122.0		
	Positive Rank	5	5.00	15.00	-2.523	.010*
	Equal	1	-			
Roles	Negative Rank	15	11.82	116.0		
	Positive Rank	4	4.50	9.00	-2.814	.005*
	Equal	1	-			
Affective Involvement	Negative Rank	13	12.56	112.00		
	Positive Rank	6	5.50	20.0	-2.183	.008*
	Equal	1	-			
Affective Responsiveness	Negative Rank	15	12.59	125.50		
	Positive Rank	5	5.50	16.50	-2.620	.006*
	Equal	0	-			
Behavior Control	Negative Rank	14	12.15	121.5		
	Positive Rank	5	5.17	15.50	-2.502	.010*
	Equal	1	-			
General Functioning	Negative Rank	14	11.90	119.0		
	Positive Rank	5	6.00	18.00	-2.323	.018*
	Equal	1	-			
Total Score	Negative Rank	13	12.40	124.0		
	Positive Rank	7	5.75	12.00	-2.545	.007*
	Equal	0	-			

*p<.05

The results in Table 5 (above) showed that there was a significant difference of .05 level between the FAD total pre-test and total post-test scores of the parents who received SFT-based psychoeducation (Z=-2.545; p<0.05). The difference scores' sum of the ranks revealed that this difference was in favor of negative ranks, in other words, the pre-test score. Similar to the total score, there was a significant difference at the .05 level between pre-test and post-test score of the parents in the experimental group in Problem Solving (Z=-2.116; p=.032), Communication (U=-2.523; p=.010), Roles (U=-2.814; p=.005), Affective Responsiveness (U=-2.183; p=.008), Affective Involvement (U=-2.620; p=.006), Behavior Control (U=-2.502; p=.010), and General Functioning (U=-2.323 ; p=.018) subscales. Considering that getting a low score on the FAD increased functionality in terms of that function, it could be said that the applied psychoeducation program had a significant effect on increasing family functionality. The findings regarding the follow-up test results performed eight weeks after the application were stated in Table 6 below.

Table 6. Wilcoxon Signed-Rank Test Results Regarding the Difference between the Experimental Group Post-Test and Follow-Up Test Scores

Sub-scales	Pre-test Post-test	n	Mean Rank	Sum of Ranks	z	p
Problem-solving	Negative Rank	10	9.57	76.00		
	Positive Rank	7	8.00	32.00	-1.140	.242
	Equal	3	-			
Communication	Negative Rank	10	10.00	70.00		
	Positive Rank	9	10.00	60.00	-0.215	.805
	Equal	1	-			
Roles	Negative Rank	13	8.00	64.00		
	Positive Rank	7	7.40	56.00	-0.442	.508
	Equal	0	-			
Affective Involvement	Negative Rank	10	10.92	79.50		
	Positive Rank	9	9.07	72.00	-0.240	.775
	Equal	1	-			
Affective Responsiveness	Negative Rank	11	11.94	82.50		
	Positive Rank	9	10.25	72.50	-0.168	.830
	Equal	0	-			
Behavior Control	Negative Rank	11	11.67	80.50		
	Positive Rank	9	8.63	62.50	-0.021	.970
	Equal	0	-			
General Functioning	Negative Rank	9	10.25	78.00		
	Positive Rank	9	9.75	72.50	-0.223	.722
	Equal	2	-			
Total Scale	Negative Rank	12	12.42	82.00		
	Positive Rank	8	9.75	70.50	-0.250	.800
	Equal	0	-			

Table 6 (above) shows that there was no significant difference between the FAD subscales and the total posttest score and the score of the follow-up test of the SFT-based psychoeducation program offered to parents. In addition, the mean scores of the subscales of FAD and the follow-up test were also lower than the mean scores of the pretest. These two findings showed that the effect of the SFT-based psychoeducation program in increasing family functions continued after eight weeks.

Discussion and Conclusions

The present study aimed to examine the effect of SFT-based psychoeducation programs prepared for parents of ADHD-diagnosed children on family functionality. The scores obtained from the FAD were administered to the parents in the control and experimental groups as a pre-test, post-test, and follow-up tests were compared. Before applying psychoeducation, there was no significant difference between the two groups. Afterward, psychoeducation was applied to the parents in the experimental group for eleven weeks and the post-test scores were obtained at the end of the application. Looking at the posttest results, the applied psychoeducation program had a significant positive effect on the family functioning of the parents in the experimental group. In the follow-up test conducted after eight weeks, it was found that this effect was permanent. Thus, the results supported the main objective of the study.

In reviewing the relevant literature, the number of studies that relied on family therapy developed for parents of children with ADHD was limited (Aman, 2000; Barkley et. al. 1992; Çırpan, 2019; Dielman & Franklin, 1998; Fischer, 2013; Kahveci & Selçuk, 2018; Ma et al., 2018; Matos et al., 2009; Scapillato, 2003; Zhu & Peng, 2009). These studies were mostly in the form of training applied to children with ADHD and their parents. It was noteworthy that there was no study investigating the effect of the SFT-based education program developed for parents of children with ADHD in Turkey. Therefore, the findings obtained from the research were evaluated by comparing them with studies conducted for similar purposes.

The “Problem Solving” sub-dimension, the first sub-scale of FAD, aims to measure family members’ ability to solve material and moral problems using family functionality (Bulut, 1990). To understand the reasons for the increase in the problem-solving skills of the parents who attended the psychoeducation program, it was necessary to look at the applied program’s second session. In this session, conflicts in families and dysfunctional

cycles used in these conflicts were discussed. After sharing the theoretical information on the subject, case studies studied problem-solving steps. Çırpan (2019) conducted a case study with a family to investigate the effects of Experiential and Cognitive-Behavioral Family Therapy practices in families of a child diagnosed with ADHD, to change the members' perspectives towards themselves and others and to examine the effects of solving the problems faced by parents. As a result of 11-week family counseling practices, a positive increase was found out in the communication and family members' problem-solving skills. In another study, Family Systems Multi-Group Therapy was applied to parents of a child with ADHD. During the group sessions, the children and families met for a play interactive session to practice the skills learned in their groups. It was concluded that 8-week applications developed parent-child interaction and effectively reduced conflicts in the home environment (Aman, 2000). Both studies' target groups were families of children with ADHD, and family therapy-based interventions were applied in both studies. However, the results of the studies emphasized that members improved their problem-solving skills thanks to the effect of the practices. Therefore, these studies support the results in terms of sample, purpose, and outcome.

The "Communication" subscale aimed to measure whether family members could enhance healthy communication (Bulut, 1990). In the third session of the psychoeducation program, intra-family communication skills were included. Effective communication skills, I language, full and single message delivery topics were applied with group activities. The increase in communication skills found in the findings can be associated with the subjects studied in this session. Öztürk (2019) examined the effect of the psychoeducation program given to mothers of children with ADHD on mother-child interaction and family functionality. The 12-week psychoeducation program was administered to 25 mothers in the experimental group. At the end of the application, it was observed that the mothers' post-test communication, showing the necessary attention and behavior control subscale score averages were significantly lower. Fallone (1998) applied 8 weeks of Behavioral Parent Training (PT), 8 weeks of PT, and Cognitive-Behavioral Self-Management Training in his doctoral thesis study with 48 mothers of children with ADHD. At the end of the program, mothers in the experimental group were found to have a decrease in maternity stress and an increase in mother-child communication. Both studies were conducted with mothers who have children with ADHD to improve communication skills. It was observed that the implemented programs improved the members' communication skills. Therefore, the findings of these studies also supported the findings of the present study.

The "Roles" subscale expresses the behavioral patterns that include meeting family members' material and spiritual needs (Bulut, 1990). Roles in a functional family include parents being competent to use resources, care for children, and manage the family system. The fourth session of the psychoeducation program applied to parents was the reason for the positive effect observed in the "roles" subscale. In this session, information about being a parent, ensuring the hierarchy within the family, and establishing the parent subsystem was shared. Ekşisu (2017) applied a 9-week parent support program to the parents of children with different behavioral problems and examined the effect on the children and their parents. The findings of the study indicated that the parent support program increased the parenting competence levels of the participants in the experimental group and improved their parenting skills. In another study, Anastopoulos et al. (1993) administered 9 sessions of behavioral parent training to parents with school-age children diagnosed with ADHD. After the training, an increase was observed in the participants' parental functions in the experimental group. Although both studies did not directly focus on roles within the family, parenting competence and parenting functions point to effective parenting and clarity in parenting roles (Demir & Gündüz, 2014). Therefore, these studies' results were in accordance with the present study's findings.

The "Affective Responsiveness" subscale indicates that family members can respond most appropriately to stimuli (Bulut, 1990). To understand the reasons for the increase in the parents' affective responsiveness participating in the psychoeducation program, it was necessary to investigate the sixth session of the applied program. In this session, the emotions experienced in the family and the ways of sharing these emotions were evaluated. Sample applications were made to be able to use correct emotional expressions and improve the effect of empathic response in maintaining the emotional closeness of the members. Barkley et al. (1992) compared the effects of three different family therapy programs on family conflict in families of children with ADHD. 20 parents received Behavior Management Training while 21 parents received Problem-Solving and Communication Training, and 20 parents received Structural Family Therapy. As a result of the research, it was observed that the intensity of anger experienced in conflicts decreased in all three groups and positive changes were observed in the expressions of anger intensity during the discussions. Although the present study differed in method from Barkley's study, it was similar in terms of the training content. In both studies, topics such as conflict resolution, communication skills, and sharing emotions were shared with parents. The results showing a positive change in anger expressions are also consistent with the results of the present study for the Affective Reactivity subscale.

The “Affective Involvement” subscale includes the care and love that family members show to each other (Bulut, 1990). The increase in the ability of parents participating in the psychoeducation program to show the necessary attention, participation in indoor and outdoor activities studied in the seventh session, could be attributed to the effect of studies aimed at supporting the child’s expectations. In addition, the efforts to prevent the existing groupings for the healthy establishment of family unity and to gain healthy unions, which were studied in the ninth session, also affected this result. Zhu and Peng (2009) examined the effect of SFT on family functioning on children with ADHD accompanied by oppositional defiant disorder. In the study where 54 children were randomly divided into the experimental and control groups, only drug treatment was applied to the control group, and family therapy was applied to the experimental group together with drug treatment. At the end of the 12-session applications that lasted for 3 months, an increase in family cohesion, emotion expression, achievement orientation, and an increase in communication, problem-solving, "affective response" and "general functioning" scores was observed among family members. Although a psychoeducation program was not implemented, the application of SFT in the study, the fact that the study group was parents with a child with ADHD, and the aim were to increase family functionality were similar points to the present study.

The “Behavior Control” subscale includes the way of setting rigid, flexible, or irregular standards and providing discipline to the behavior of the members (Bulut, 1990). The eighth and tenth sessions of the psychoeducation program applied to parents give the reasons for the positive effect observed in the behavior control subscale. In these sessions, information was shared about the parents’ establishing a healthy power relationship in the family, parents’ determination, consistency, correct language, and flexibility in behavioral control, and practices were carried out to acquire targeted skills. Matos et al. (2009) applied Parent-Child Interaction Therapy to 32 parents of Puerto Rican preschool children with ADHD. In practices whose main goal was to reduce problematic behaviors in children, parents were taught how to guide their children, and when giving instructions, they should give clear, positive, consistent, and direct commands for behavior. At the end of the research, it was concluded that parents feel more competent and less stressed in managing their children’s behavior. In this study, which aimed to reduce behavioral problems in children, practices aimed at providing behavioral control were also effective in parents’ management of their children’s behaviors. Therefore, the results were consistent with the behavioral control results of this study.

The “General Functioning” subscale is considered as an indicator of the general health of the family (Bulut, 1990). The positive effect observed in the general functioning subscale was the 11-session psychoeducation program applied to the parents. In this program, which aimed to increase the family functionality of parents of children with ADHD, in order to improve the characteristics observed in functional families, communication within the family, conflict resolution, parental attitudes, boundaries between members, healthy sharing of emotions, spending time together, power in the family, family groupings, flexibility and behavior control. In Öztürk’s (2013) study examining the effect of parental education on ADHD symptoms in children, the Triple-P Positive Parenting Program, which lasted 8 weeks, was applied to 23 parents whose children were between the ages of 7 and 12. Among the research findings, in addition to the decrease in ADHD symptoms in children, a statistically significant decrease was observed in family roles, problem-solving, communication, behavior control, and general functioning. Harputlu (2014) applied two-month psychosocial training to the mothers of first-grade primary school students diagnosed with ADHD to reorganize their relations with their children, and a supportive study was conducted. In the training, mothers were informed about correct and effective communication, meeting the social, emotional, and behavioral demands suitable for the developmental levels of their children, and ways of establishing control that supports development. At the end of the training, a positive increase was observed in the mothers' problem-solving, communication, emotional responsiveness, and general functions scores in the experimental group. Also, it was determined that mothers who participated in supportive activities also showed improvement in the “affective involvement” and “roles” subscales. The general functioning subscale results from both studies supported the findings of this study.

Prior to concluding, certain limitations in this study should be addressed. Because the children of the participants in the study group did not have comorbidity, the generalizability of the results was limited only to parents who have a child with ADHD. Therefore, the results were limited to parents who have only one child diagnosed with ADHD. This program, designed to improve family functionality, was limited to 11 weeks. Another limitation is that no training was provided for the control group. As a result, an SFT-based psychoeducation program was applied to parents of a child diagnosed with ADHD for the first time in Turkey, and it was seen that the program was effective in increasing family functionality. Therefore, this finding contributed to the literature by overlapping with the results obtained from different family therapy approaches and parent psychoeducation.

Recommendations

According to the findings of the research, it was possible to suggest the following:

Eight weeks after completion of the psychoeducation program for parents, a follow-up study was conducted. However, it was not known exactly how long the implemented program was effective. Future studies could increase the number of follow-up visits to examine the long-term effects of the program. The children of the participants in the study group of this study only had a diagnosis of ADHD. Future studies could examine the effectiveness of the program by working with parents who have children with comorbid ADHD. The parents in the study group had only one child. The effectiveness of the program could be tested by working with parents with two or more children. In addition, it may be recommended that the program be implemented with parents who have children with ADHD in different age groups.

Acknowledgements or Notes

This work was supported by Kocaeli University Scientific Research Projects Coordination Unit. Project Number: SBA-2020-2063.

References

Aponte, H., & Van Deusen, J. M. (1981). *Structural family therapy. In handbook of family therapy*. In A. S. Gurman & D. P. Kniskern (Eds.). Bristol: Brunner / Mazel.

Alacahan, O. (2010). Aile birliğini oluşturan faktörler ve işlevleri [The factors and processes by the create family unity]. *Journal of Economics and Administrative Sciences*, *1*(1), 289-298.

Aman, L. A. (2000). *Family systems multi-group therapy for ADHD children and their families*. (Doctoral dissertation). Walden University, USA.

Anastopoulos, A. D., Shelton, T. L., DuPaul, G. J., & Guevremont, D. C. (1993). Parent training for attention-deficit hyperactivity disorder: its impact on parent functioning. *Journal of Abnormal Child Psychology*, *21*, 581–596.

Anderson, S. A., & Gavazzi, S. M. (1990). A test of the olson circumplex model: examining its curvilinear assumption and the presence of extreme types. *Family Process*, *29*(3), 309-324. https://doi.org/10.1111/j.1545-5300.1990.00309.x

Ay, M. A. (2019). *Kanser tanılı ve sağlıklı ergen çocuğu olan annelere uygulanan psikoeğitimin ebeveyen rolüne ilişkin kendilik algısı, stresle başa çıkma ve ruhsal belirtiler üzerine etkisi* [*Effects of a psychoeducation program given to mothers with a child cancer-diagnosed child and a healthy adolescent on their self perception of parental role, ways of coping with stress and mental symptoms*]. (PhD thesis). Hacettepe University, Ankara.

Barkley, R. A., Guevremont, D. C., Anastopoulos, A. D., & Fletcher, K. E. (1992). A comparison of three family therapy programs for treating family conflicts in adolescents with attention-deficit hyperactivity disorder. *Journal of Consulting and Clinical Psychology*, *60*(3), 450–462. https://doi.org/10.1037/0022-006X.60.3.450

Börekçi, B. (2017). *Okul öncesi çocuklarda dikkat eksikliği hiperaktivite bozukluğu belirtilerinin, davranışsal, sosyal problemler, aile işlevselliği ve ebeveyn tutumları ile ilişkilerinin değerlendirilmesi* [*Preschool children with symptoms of attention deficit hyperactivity disorder: parental attitudes, impairments in behavioral, social, school and family functioning*]. (Master dissertation). Işık University, İstanbul.

Bulut, I. (1990). *Aile değerlendirme ölçeği (ADÖ) el kitabı* [*Family assessment scale (FAS) handbook*]. Ankara: Özgüzeliş Press.

Chappelle, N., & Tadros, E. (2021). Using structural family therapy to understand the impact of poverty and trauma on African American adolescents. *The Family Journal Counseling and Therapy for Couples and Families, 29*(2), 237-244. https://doi.org/10.1177/1066480720950427

Churchill, S. S., Leo, M. C., Brennan, E. M., Sellmaier, C., Kendall, J., & Houck, G. M. (2018). Longitudinal impact of a randomized clinical trial to improve family function, reduce maternal stress and improve child outcomes in families of children with adhd. *Maternal and Child Health Journal*, *22*, 1172-1182. https://doi.org/10.1007/s10995-018-2502-5

Colapinto, J. (1979). The relative value of empirical evidence. *Family Process*, *18*(4), 427–441. https://doi.org/10.1111/j.1545-5300.1979.00427.x

Colapinto, J. (2019). *Structural family therapy*. In B. H. Fiese, M. Celano, K. Deater-Deckard, E. N. Jouriles & M. A. Whisman (Eds.), APA handbook of contemporary family psychology: Family therapy and training (pp. 107-121) American Psychology Association.

Çırpan, A. B. N. (2019). *Aile danışmanlığı uygulamalarının dikkat eksikliği ve hiperaktivite bozukluğu üzerindeki etkisi: vaka çalışması* [*The effect of family counseling applications on attention deficiency and hyperactivity disorder: case study*]. (Master thesis). Sabahattin Zaim University, İstanbul.

De Lucia-Waack, J. L. (2006). *Leading psychoeducational groups for children and adolescents*. United Kingdom: Sage Publications.

Demir, S., & Gündüz, B. (2014). Ebeveyn yetkinlik ölçeğinin uyarlanması: geçerlik ve güvenirlik çalışmaları [Adaptation of the parental self-efficacy scale: the study of validity and reliability]. *Mustafa Kemal University Journal of Graduate School of Social Sciences*, *11*(25), 309-322.

Dielman, M. B., & Franklin, C. (1998). Brief solution-focused therapy with parents and adolescents with adhd. *Social Work in Education*, *20*(4), 261-265. https://doi.org/10.1093/ cs/20.4.261

Ekşisu M (2017). *Davranış sorunları olan 3-6 yaş çocuğa sahip anababalar için geliştirilen "anababalık destek programının" etkililiği* [*The efficacy of "parenting support program" developed for parents of 3-6 ages children with behavior problems*]. (PhD thesis). Ankara University, Ankara.

Epstein, N. B., Baldwin, L. M., & Bishop, B. S. (1983). The McMaster family assessment device. *Journal of Marital and Family Therapy*, *9*(2), 171-180. https://doi.org/10.1111/j.1752-0606.1983.tb01497.x.

Fedele, D. A., Hullmann, S. E., Chaffin, M., Kenner, C., Fisher, M. J., Kirk, K., Eddington, A. R., Sean, P., McNall-Knapp, R. Y., & Mullins, L. L. (2013). Impact of a parent based interdisciplinary intervention for mothers on adjustment in children newly diagnosed with cancer. *Journal of Pediatric Psychology*, *38*(5), 531-540. https://doi.org/10.1093/jpepsy/jst010

Fischer, M. F. (2013). *Multifamily family therapy group for adhd children and their families: a delphi study*. (Doctoral dissertation). Virginia Tech.

Freistadt, J., & Strohschein, L. (2013). Family structure differences in family functioning interactive effects of social capital and family structure. *Journal of Family Issues*, *34*(7), 952-974. https://doi.org/10.1177/0192513X12447054

Fristad, M., Gavazzi, S., Centolella, D., & Soldano, K. (1996). Psychoeducation: a promissing intervention strategy for families of children and adolescents with mood disorders. *Contemporary Family Therapy*, *18*, 371-383. https://doi.org/10.1007/BF02197048

Gehring, T. M., & Feldman, S. S. (1988). Adolescents' perceptions of family cohesion and power: a methodological study of the family system test. *Journal of Adolescent Research*, *3*, 33-52. https://doi.org/10.1177/074355488831004

Gladding, S. T. (2014). *Family therapy: history, theory and practice*. USA: Pearson Higher Edition.

Gottlieb, L. J. (2013). *The application of structural family therapy to the treatment of parental alienation syndrome*. In A. J. L. Baker (Ed.), Working with alienated children and families: A clinical guidebook (pp. 209–231). New York: Routledge. https://doi.org/10.1080/01926187.2013.792712

Gökçen, C., Özatalay, E., & Fettahoğlu, E. Ç. (2011). Dikkat eksikliği hiperaktivite bozukluğu olan çocukların anne babalarında psikolojik belirtiler ve aile işlevselliği [Family functioning and psychological symptoms in parents of children with attention deficit and hyperactivity disorder]. *Turkish Journal of Child and Adolescent Mental Health*, *18*, 95-104.

Griffith, J. L., & Griffith, M. E. (1987). Structural family therapy in chronic illness: Intervention can help produce a more adaptive family structure. *Psychosomatics*, *28*(4), 202-205. https://doi.org/10.1016/S0033-3182(87)72544-4

Harputlu, A. (2014). *Hiperaktivite ve dikkat eksikliği (hade) teşhisi konulmuş ilköğretim birinci kademe öğrencilerinin annelerine yönelik psikososyal yardım uygulaması: deneysel çalışma* [*An implementation of psychosocial help program to the mothers of elementary school children diagnosed with attention deficit and hyperactivity (adhd): an experimental study*]. (Master thesis). Çukurova Üniversity, Adana.

Hetchman, L. (1981). *Families of hyperactives*. Greeney J. (Editor). Research in community and mental health. (pp. 275-292), Greenwich: JAI Pres.

Hoza, B., Owens, J. S., Pelham, W. E., Swanson, J. M., Conners, C. K., Hinshaw, S. P., Arnold, L. E., & Kraemer, H. C. (2000). Parent cognitions as predictors of child treatment response in attention-deficit/hyperactivity disorder. *Journal of Abnormal Child Psychology*, *28*(6), 569-583. https://doi.org/10.1023/A:1005135232068

Horn, W. F., Ialongo, N., Popovich, S., & Peradotto, D. (1987). Behavioral parent training and cognitive-behavioral self-control therapy with ADHD children: comparative and combined effects. *Journal of Clinical Child Psychology*, *16*(1), 57–68. https://doi.org/10.1207/s15374424jccp1601_8

Işık, B., & Güven, Y. (2007). Okul öncesi çocukların aile işlevlerinin incelenmesi: anne açısından aileye genel bakış [An investigation of preschool children's family functions: a general outlook on the family from the mother's perspective]. *Educational Sciences: Theory and Practice*, *7*(3), 1263-1300.

İkiz, H. (2009). 6 yaş grubundaki çocukların benlik algıları ile aile işlevleri arasındaki ilişkinin incelenmesi [The investigation ofthe relationship between self perception levels of children in 6 years ago group with family functions] (Master thesis). Marmara University, İstanbul.

Jacobs, E. E., Masson, L. R., & Harvill, R. L. (2006). *Group counseling strategies skills*. USA: Thompson.

Johnston, C., & Mash, E. J. (2001). Families of children with attention-deficit/hyperactivity disorder: review and recommendations for future research. *Clinical Child and Family Psychology Review*, *4*(3), 183-207. https://doi.org/10.1023/a:1017592030434

Jones, J., & Passey, J. (2004). Family adaptation, coping and resources: parents of children with developmental disabilities and behaviour problems. *Journal on Developmental Disabilities*, *11*(1), 31-46.

Kahraman, S., & Tanrıkulu, T. (2019). Ebeveynin üstün yetenekli çocuğuyla iletişimini geliştirmeye yönelik psikoeğitim programının etkisinin incelenmesi [Examining the effectiveness of psychoeducational program on development of parents' communication with gifted child]. *Turkish Journal of Giftedness and Education*, *9*(1), 32-46.

Kahveci, G., & Selçuk, M. (2018). The effects of parent–child interaction therapy (pcit) in a child with attention deficit hyperactivity disorder. *Turkish International Journal of Special Education and Guidance & Counseling*, *7*(1), 28-40.

Ma, J. L. C., Lai, K. Y. C., Wan, E. S. F., & Xia, L. L. L. (2018). Multiple family therapy for Chinese families of children with attention deficit hyperactivity disorder (ADHD): treatment efficacy from the children's perspective and their subjective experiences. *Journal of family Therapy*, *1*, 1-21. https://doi.org/10.1111/1467-6427.12240

Malkoff, A. C., Grace, M., Kapke. L, T., & Gerdes, A. C. (2020). Family functioning in latinx families of children with ADHD: the role of parental gender and acculturation. *Journal of Child and Family Studies*, *29*(4), 1108-1122. https://doi.org/10.1007/s10826-019-01673-5

Margari, F., Craig, F., Petruzelli, M. G., Lemanna, A., Matera, E., & Margari, L. (2013). Parents psychopathology of children with attention deficit hyperactivity disorder. *Research in Developmental Disabilities*, *34*(3), 1036-1043. https://doi.org/10.1016/j.ridd. 2012.12.001

Matos, M., Bauermeister, J. J., & Bernal, G. (2009). Parent-child interaction therapy for puerto rican preschool children with ADHD and behavior problems: a pilot efficacy study. *Family Process*, *48*(2), 232-252. https://doi.org/10.1111/j.1545-5300.2009.01279.x

Mingfei, W., Jiang, Q., & Rui, L. (2012). The effect of structure family therapy on behaviors and executive functions of children with ADHD. *China Journal of Health Psychology*, *12*, 210-225.

Minuchin, S. (1974). *Families & family therapy*. England: Harvard University Press.

Morawska, A., & Sanders, M. R. (2009). Parenting gifted and talented children: conceptual and empirical foundation. *Gifted Child Quarterly*, *53*(3), 163-173. https://doi.org/ 10.1177/0016986209334962

Morgan, B., & Hensley, L. (1998). Supporting working mothers through group work a multimodal psychoeducational approach. *Journal of Specialists in Group Work*, *23*(3), 298-311. https://doi.org/10.1080/01933929808411402

Morris, S. S., Musser, E. D., Tenenbaum, R. B., Ward, A. R., Martinez, J., Raiker, J. S., Coles, E. K., & Riopelle, C. (2020). Emotion regulation via the autonomic nervous system in children with attention deficit/hyperactivity disorder (adhd): replication and extension. *Journal of Abnormal Child Psychology*, *48*(3), 361-373. https://doi.org/10.1080/01933929 808411402

Nichols, M. (2013). *Family therapy, concepts and methods: international edition*. 10th Ed. Pearson.

Norvilitis, J. M., Scime, M., & Lee, J. S. (2002). Courtesy stigma in mothers of children with adhd: a preliminary investigation. *Journal of Attention Disorder*, *6*(2), 61-68. https://doi.org/10.1177/108705470200600202

Öner, N. (1994). Türkiye'de kullanılan psikolojik testler [Psychological tests used in Turkey]. İstanbul: Boğaziçi Press.

Öztürk, Y. (2013). *Triple P olumlu anne babalık eğitimi'nin dikkat eksikliği ve hiperaktivite bozukluğu olan 7-12 yaş arası çocuklarda dikkat eksikliği hiperaktivite bozukluğu belirtileri üzerine etkilerinin araştırıldığı randomize kontrollü bir çalışma* [*Effectiveness of triple-p positive parenting program on childhood attention deficit hyperactivity disorder: a case control study*]. (Master thesis). Dokuz Eylül University, İzmir.

Özyurt, G., Pekcanlar Akay, A., & Öztürk, Y. (2015). Dikkat eksikliği ve hiperaktivite bozukluğu (dehb) tanısı olan olgularda aile işlevselliği ve anne anksiyetesinin kontrol grubu ile karşılaştırılması [Family functioning and maternal anxiety among cases diagnosed with adhd: a comparison study]. *Journal of Cognitive Behavioral Psychotherapy and Research*, *3*, 162-172.

Penuelas-Calvo, I., Palomar-Ciria, N., Porras-Segovia, A., Miguélez-Fernándeze, C., Baltasar-Tellof, I., Perez-Colmeneroa, S., Delgado-Gómez, D., Carballo, J. J., & Baca-García, E. (2021). Impact of adhd symptoms on family functioning, family burden and parents' quality of life in a hospital area in Spain. *The European Journal of Psychiatry*, *35*(3), 166-172. https://doi.org/10.1016/j.ejpsy.2020.10.003

Pomeroy, E., Rubin, A., Van Laningham, L., & Walker, R. (1997). "Straight talk". The effectiveness of a psychoeducational group intervention for heterosexuals with hiv/aids. *Research on Social Work Practices, 7*(2), 149-164. https://doi.org/10.1177/104973159700700201

Rogers, M. A., Wiener, J., Marton, I., & Tannock, R. (2009). Parental involvement in children's learning: comparing parents of children with and without attention deficit/hyperactivity disorder (adhd). *Journal of School Psychology, 47*(3), 167-185. https://doi.org/10.1016/j.jsp.2009.02.001

Perosa, L. M., & Perosa, S. L. (1981). The school counselor's use of structural family therapy with learning-disabled students. *The School Counselor, 29*(2), 152-155.

Satterfield, J. H., Satterfield, B. I., & Schell, A. E. (1987). Therapeutic intervention to prevent delinquency in hyperactive boys. *Journal of the American Academy of Child and Adolescent Psychiatry*, *26*(1), 56-64. https://doi.org/10.1097/00004583-198701000-00012

Scahill, L., Schwab-Stonem, M., Merikangas, K. R., Leckman, J. F., Zhang, H., & Kasl, S. (1999). Psychosocial and clinical correlates of adhd in a community sample of school-age children. *Journal of the American Academy of Child & Adolescent Psychiatry*, *38*(8), 976-984. https://doi.org/10.1097/00004583-199908000-00013

Scapillato, M. (2003). Use of the multiple family group therapy in managing children's ADHD. *The ADHD Report*, *11*(3), 9-15.

Soysal, A. Ş., Yıldırım, A., Acar, A., Karateke, B., & Kılıç, K. M. (2013). Dikkat eksikliği hiperaktivite bozukluğu alt tiplerinin aile işlevleri üzerindeki etkisi [Effects of attention deficit and hyperacitivity disorder subtypes on family functions]. *The Journal of Psychiatryand Neurological Science*, *26*, 286-294. https://doi.org/10.5350/DAJPN2013260308

Szapocznic, J., Rio, A., Murray, E., Cohen, R., Scopetta, M., Rivas-Vazquez, A., Hervis, O., Posada, V., & Kurtines, W. (1989). Structural family versus psychodynamic child therapy for problematic hispanic boys. *Journal of Consulting and Clinical Psycology*, *57*(5), 571-578. https://doi.org/10.1037/0022-006x.57.5.571

Tura, G. (2020). Yapısal aile sistemleri yaklaşımına dayalı olarak geliştirilen evlilik danışma programının çiftlerin evlilik uyumuna etkisi [The effect of marriage counseling program developed based on structural family systems approach to marital adjustment of couples]. *Bingöl University Journal of Social Sciences Institute*, *10*(19), 85-104. https://doi.org/10.29029/busbed.586530

Ulman, K. H. (2000). An intergrative model of stress management groups for women. *International Journal of Group Psychotherapy*, *50*(3), 341-362. https://doi.org/10.1080/00207284.2000.11491013

Uran, P., & Kılıç, B. G. (2020). Family functioning, comorbidities, and behavioral profiles of children with ADHD and disruptive mood dysregulation disorder. *Journal of Attention Disorders*, *24*(9), 1285-1294 https://doi.org/10.1177/1087054715588949

Wang Q, Zhou T (2015). The impact of family functioning and mental health condition on the child's behavioral problems. *Social Behavior and Personality*, 43(7): 1135–1146. https://doi.org/10.2224/sbp.2015.43.7.1135

Weaver, A., Greeno, G. C., Marcus, S. C., Fusco, R. A., & Anderson, C. (2013). Effects of structural family therapy on child and maternal mental health symptomatology. *Research on Social Work Practice*, *23*(3), 294-303. https://doi.org/10.1177/1049731512470492

Wetchler, J. L., Hecker, L. L. (2014). *An introduction to marriage and family therapy*. 2.nd edition, New York: Routledge.

Yang, H. L., & Pearson, V. J. (2002). Understanding families in their own context: schizophrenia and structural family therapy in Beijing. *Journal of Family Therapy*, *24*(3), 233-257. https://doi.org/10.1111/1467-6427.00214

Zafra, J. (2017). The use of structural family therapy with a latino family: a case study. *Journal of Systemic Therapies*, *35*(4), 11-21. https://doi.org/10.1521/jsyt.2016.35.4.11

Zhu, Z., & Peng, L. (2009). Effect of structural family therapy on adhd children with oppositional defiant disorder. *Journal of Taishan Medical College*, *30*(6), 32-47.

International Journal of Contemporary Educational Research (IJCER)

www.ijcer.net

A Family Education Intervention for Parents Having Children with Multiple Disabilities during COVID-19

A.Emel Sardohan Yıldırım[1], Rabia Vezne[2]
[1]Akdeniz University, 0000-0002-2393-299X
[2]Akdeniz University, 0000-0002-0137-3613

Article History
Received: 04.10.2021
Received in revised form: 20.02.2022
Accepted: 26.02.2022
Article Type: Research Article

To cite this article:

Sardohan-Yıldırım, A.E., & Vezne, R. (2022). A Family Education Intervention for Parents Having Children with Multiple Disabilities during COVID-19. *International Journal of Contemporary Educational Research*, *9*(1), 179-190. https://doi.org/10.33200/ijcer.1004241

International Journal of Contemporary Educational Research
Volume 9, Number 1, March 2022, 179-190 ISSN: 2148-3868

A Family Education Intervention for Parents Having Children with Multiple Disabilities during COVID-19

A.Emel Sardohan Yıldırım[1*], Rabia Vezne[1]
[1]Akdeniz University

Abstract

During the COVID-19 pandemic, it has been observed that the education stakeholders including families are caught unprepared. For this reason, it is thought that determining families' educational needs regarding their children with multiple disabilities in the isolation period are essential. This study aimed to determine the contribution of "Family Education Intervention in Pandemic" (FEIP) Training to families and their multiple disabled children. In the research, a multiple case study approach was used. Four mothers participated in the study. Virtual training in the study was carried out in eight sessions. The data were collected with multiple sources and analysed inductively by the triangulation method. In the research, it was revealed that FEIP supported mothers to realize their children's strengths, increase their positive parenting skills, and feel competent in their children's daily routines during the COVID-19 period.

Keywords: Multiple disabilities, COVID-19, Virtual family education, Adult education, Virtual intervention

Introduction

The World Health Organization (WHO) officially declared Coronavirus (COVID-19) as a global epidemic (WHO, 2020), and COVID-19, spreading rapidly across the world, has affected the world in the political, economic, and social contexts. One of the most important sectors affected by COVID-19 is education because the closure of schools and the start of virtual education brought unprecedented challenges to governments, ministries responsible for education, teachers, students, careers, and the parents (Can, 2020; Chang and Yano 2020; Daniel, 2020). Lockdown has placed people under great duress; for those whose life situations are inherently complex, this situation has conspired to create environments that are volatile, potentially damaging to relationships, and likely to induce feelings of helplessness. Therefore, it is timely and valuable for educators in these unprecedented times to consider how models of support might be brokered on behalf of those families where one or more members are multiply disabled. Especially, the virtual education programs applied for typically developing children could not be benefited by students with special needs because these programs were not adapted for them. Therefore, families had to undertake both teaching and parenting duties at the same time. In addition, there is so much uncertainty for families and children because they di not know when the pandemic will end (Daniel, 2020). Since not only typically developing children and their families, but also children with special needs (Courtenay, 2020; Courtenay & Perera, 2020) and their families (Reimers & Schleicher, 2020) were adversely affected in the pandemic.

It is a fact that parents having children with multiple disabilities (C/MD) may experience more difficulties due to their child's multiple disabilities than parents having a child with a single disability. The most important reason for this is that an individual with multiple disabilities has more than one disability at the same time. Mednick (2007) described individuals with multiple disabilities as physical, cognitive, communication, sensory and affective difficulties, and emphasized that multiple disability is an umbrella term and one disability affects another. Therefore, they need much more intense education interventions in the fields of communication, education, and social life (Nakken & Vlaskamp, 2007; Van Timmeren et al., 2016), and the planning of these education interventions for individuals with multiple disabilities requires special expertise.

* Corresponding Author*: Rabia Vezne, rabiavezne@akdeniz.edu.tr*

Before COVID-19, parents having C/MD also had many difficulties related to their children's educational needs. Foremost among them, their children cannot receive regular special education services. One of the difficulties is the lack of systematic expert support for them and their children (Wang & Michaels, 2009). In addition, their children's lack of motivation for learning (Eldeniz Çetin & Sönmez, 2018), insufficient family activities and consequently missed learning opportunities (Axelsson et al., 2013), insufficient knowledge of families to strengthen their child's skills (Majnemer et al., 2013) and parents' diminished hope of becoming a family (Bourke-Taylor et al., 2015) are other difficulties that can be listed. It is thought that families who have these difficulties before the COVID-19 period might feel inadequate on some issues and might be in need of education and support to fulfil their responsibilities during the pandemic evermore. Therefore, it has been revealed that the quality of life decreases because of all these difficulties (Luijkx et al., 2019).

In the COVID-19 period, individuals with special needs could not perform their daily activities, their routines changed (Turk & McDermott, 2020), and current education and social support systems failed (Esentürk, 2020; Qi & Hu, 2020; Yıldırım et al., 2020). Furthermore, the experts could not give support at home because of the rapid spread of the virus (Courtenay, 2020). It was also found that the daily routines of individuals with special needs are disrupted, their unwanted behaviors occurred more because of the limited interpersonal and social relationships (Zhang et al., 2020), their levels of stress and anxiety increased (Courtenay & Perera, 2020), and psychosocial problems occurred (Ansari & Yousefabad, 2020; Narzisi, 2020; Pfefferbaum & North, 2020). These adverse situations affect the individual with special needs and all the family members. In the Ecological System Theory, Bronfenbrenner (1979) states that the child lives in a microsystem (e.g., home environment, family environment, classroom), which directly affects his or her own development. The adoption of the Bronfenbrenner Model to highlight the interaction between the contexts in which people live and the personal attributes of individuals provides a tangible representation of how in times of extreme change the dynamics of life might play out. While family members (mother, father, siblings, etc.) directly affect the child's development, the child also affects other members in the microsystem. Therefore, experts intending to work with children with special needs and their families should manage the process from this holistic perspective. Thus, instead of focusing on "correcting" the child, an approach towards meeting the needs of the child and his family should be adopted (Çelebi, 2019). Moreover, the families' needs, routines, and dynamics and the limitations brought by the COVID-19 period should be taken into account while organizing the education for parents having C/MD. According to the literature review, it has been seen that especially at the beginning of and during the pandemic, there is no study done about virtual training for parents having C/MD. Therefore, this study will fill a gap in the literature.

Research Questions

In the literature, there is a lack of research related to the educational needs of families having C/MD in a pandemic period. Since it is essential to determine the educational needs of families having C/MD and provide education interventions in line with these needs in the pandemic, the researchers developed an education intervention for families with C/MD according to the needs analysis at the beginning of the research. This study aimed to analyse the effectiveness of "Family Education Intervention in Pandemic" (FEIP), which is planned according to the educational needs of families having C/MD. In this context, answers to the following questions were sought.

1. How did the FEIP intervention affect the dynamics of family life?
2. What are the behavior changes in family members after the intervention?
3. What are mothers' opinions regarding the quality and provision of the intervention?

Research Method

Research Design

A multiple case study of the qualitative research method was used in this study. More than one case study is included in the research in a multiple case study. The researchers focus on a topic or problem and select more than one case that exemplifies similar processes to reveal and identify possible different views, perceptions (Creswell, 2013; Yin, 2014). In this study, four mothers who exemplified similar processes were included in the research process.

Participants

Criterion sampling method, one of the purposeful sampling technique was used. The participants of the study were four mothers living in Antalya, whose children are between the ages of 12-20 and diagnosed with multiple disabilities. In this study, participants were selected according to having C/MD, unlimited internet, smartphone, and WhatsApp application.

Before the start of the research, six mothers having C/MD were asked to participate in the research but two of them refused to participate and said their problems with their spouses increased in the isolation period and therefore they did not feel ready for a systematic and organized education intervention because of their negative emotions (Researcher diary, 20.10.2020, p. 2). Table 1 shows the demographic features of the participants.

Table 1. Demographic features of participating mothers.

Mother	**Age**	**Educational Status**	**Number of Children**	**Number of C/MD**	**Age and Type of Disability of the C/MD**	**Average Monthly Income***
Mother 1	41	Literate	4	3	17; Moderate Intellectual Disability (ID) and chronic (kidney failure) disease, 18; Mild ID, mild hearing impairment, 20; Moderate ID and mild hearing impairment	2,943 TL.
Mother 2	44	Undergraduate	2	1	19; Autism Spectrum Disorder and chronic illness (Epilepsy)	5,700 TL.
Mother 3	36	High School	1	1	12; Down Syndrome, Autism Spectrum Disorder and chronic (heart problem) disease	4,500 TL.
Mother 4	54	Primary School	2	1	12; Down syndrome and chronic (heart problem) disease	3,600 TL.

**1 Euro is 9.7418 TL (INFOREURO, November 2020)*

Data Collection Tools

In this study, four different data collection tools have been used to obtain a picture of the ecology of each family. These tools are a 'family demographic information form", a needs assessment form, a researcher diary, and a semi-structured interview form. The family demographic information form included 14 items containing various demographic information about the mother and C/MD.

The needs assessment form, developed by the researchers, was used to determine the different needs of the mother regarding C/MD. There were five questions including the areas where the child is strong, the routines of the family, the educational needs of C/MD and social needs of C/MD, and the expectations from the researchers. The researchers took the answers to the questions as notes and grouped the needs. The questions were asked to the families during virtual meetings in the two groups on the date of 21.10.2020. On 23 October,2020, a confirmation meeting was held with families about their needs and researchers began preparing intervention content according to adult learning principles.
The researcher's diary, kept by the researcher who gave the education, was a journal starting from the planning phase of the research (20.10.2020), until the end of reporting (31.12.2020) and it was a small notebook of 23 pages. The journal included impressions and self-evaluations of the researcher about the process, family education sessions, and participants.

Semi-structured questions were prepared by the researchers and the opinions of three experts in the field of special education and one expert in the field of Turkish Language were taken. Semi-structured interviews, individually and virtual, were conducted with the mothers after the intervention to evaluate the FEIP. With these interviews, it is aimed to reveal the opinions and suggestions of the mothers who participated in the study on the changes in the dynamics of life following the FEIP, the behavioural changes following the FEIP and the quality and provision of the FEIP. At the beginning of the interviews, the expert who made the interview explained the purpose of the interview and the process to each mother and obtained permission to record it.

Process

The research process had five stages including meeting the families and identifying needs, confirming the needs, preparing FEIP, implementing FEIP and evaluating FEIP. First, one of the researchers organized a virtual meeting with the families and identified their needs about their children. Second, families were asked to approve the needs stated in the previous interviews and add additional needs if emerged. Then, FEIP content was prepared by using the national and international literature about multiple disability, COVID-19, and principles of adult education. Moreover, one of the researchers who is an expert on adult education designed the intervention according to the learning characteristics of adult learners and principals of adult education using the adult education literature (Cercone, 2008; Merriam & Caffarella, 1999). Family education was carried out using the video chat feature of the WhatsApp Program for eight weeks. The details of the education sessions can be seen in Table 2.

Table 2**.** FEIP plan

Name of the Session	**Content of the Session**	**Duration**	**Date**
Giving Information about FEIP	FEIP content, mutual expectations, duties, and responsibilities	47' 41'	24.10.2020 27.10.2020
Adaption to the Pandemic	Problems of C/MD during the pandemic	76' 85'	31.10.2020 03.11.2020
Creating Teaching Opportunities	The strategies that will support mothers to spend quality time with their children during the isolation period	81' 65'	07.11.2020 10.11.2020
Creating In-Home Routines (Session 1)	Identifying daily routines	67' 78'	14.11.2020 17.11.2020
Creating In-Home Routines (Session 2)	The points to be considered in the usage of instructions	52' 65'	21.11.2020 24.11.2020
Strengthening Domestic Relations	The strengths of the child and reinforcing the weaknesses	94' 108'	28.11.2020 01.12.2020
Strengthening Domestic Relations	Qualified parent-child and child-sibling communication	87' 93'	05.12.2020 08.12.2020
Summing Up FEIP	Reviewing the sessions	47' 53'	12.12.2020 15.12.2020

Individul semistructured interviews were conducted with mothers virtually to collect data on the impact of FEIP on mothers' lives and C/ MD to assess the sustainability of learning outcomes after 22 days.

Data analysis

In order to provide data diversity and create data that strengthens the research, different data collection techniques have been used and data diversity has been provided (Creswell, 2013). The analysis of all data was done by the inductive analysis method. The analysis process was carried out in the form of creating categories, codes, and themes by researchers and a specialist in the field of special education independently from each other. Then, the categories, codes, and themes were compared, and the reliability was calculated with the inter-rater reliability (Inter-rater reliability = consensus/consensus + disagreement x 100). According to this calculation, the reliability coefficient was 87.05%. Finally, the researchers and the expert came together and discussed the categories, reached a consensus, and the researchers reported the final version.

Validity and Reliability

For the validity and reliability of the research, three different field experts' opinions and suggestions related to the data collection tools and the content of FEIP were received, and the final versions of both the data collection tools and the content of FEIP were given. With the data collected from more than one source, it was possible to verify the research from more than one direction. The reliability was calculated with the inter-rater reliability (Inter-rater reliability = consensus/consensus + disagreement x 100). According to this calculation, the reliability coefficient was 87.05%. To protect the private lives of the mothers participating in the research, code names were used in the research report (such as Mother 1, Mother 2). Participants were informed about the research, the data collection techniques, and tools used, and informed consent forms were signed by mothers.

Findings

This study aimed to analyse the contribution of FEIP to mothers having C/MD during the COVID-19. Findings are presented in three subheadings, including changes in the dynamics of family life, behavioural changes after the FEIP, and mothers' opinions about the quality and delivery of the intervention. The emerging themes and subthemes can be seen in Table 3.

Table 3. Themes and sub-themes

Themes	**Sub-themes**
Changes in the Dynamics of Family Life	Organised and better home life
Behaviour Changes after FEIP	Creating Routines Strengthening Family Relations
Opinions Regarding the Quality and Provision of the FEIP	Application Process Researcher Suggestions

Changes in the Dynamics of Family Life

The mothers participating in the research stated that they felt better after the intervention they participated in; they could have free time for themselves; their home life became organized; and they realized the strengths and weaknesses of C/MD. In this context, they learnt the areas that should be supported in their children and they planned their activities accordingly. Moreover, they underlined that they were able to be more tolerant to C/MD. Mothers also stated that they did not used to spending long hours at home with all family members in normal life, so they had difficulty in getting used to staying at home for long hours with all family members during the pandemic. Mothers added that they had better relationships with their spouses, they started a planned and routine life at home, and the FEIP made it easier for them to get used to spending long hours at home with C/MD and the whole family.

After identifying the needs of the mother, the researcher wrote in her diary that;

> *"The mothers' process of getting used to home will also be difficult, they seem tense and unhappy, they have never stayed together with their children for so long and without support, and they liken themselves to fish that came out of the water, in isolation period" (Researcher's diary, October 23, 2020).*

Regarding the changes, one of the mothers (Mother 2) said:

> *"I consider* the isolation period *differently before and after this education. Previously, I saw myself as someone inadequate, unable to reach anything, unhappy, and shouting at home with everyone. It was very difficult to manage everyone in the house at the same time. But with this education, I gradually learned to live peacefully and calmly together, even my husband became calmer"…*

Finally, a mother (Mother 3) expressed her opinions with these words:

> *"I realized that I never had free time for myself, I see even the smallest things to myself a lot. I was always in a mess, but with this training, my life became more organised. For example, I could not find time to drink coffee before, now I make coffee time for myself…."*

Behaviour Changes after FEIP

Under this theme, two sub-themes including creating routines and strengthening domestic relations were identified.

Creating Routines

Mothers stated that their children spend all day at home with the closure of schools due to the pandemic and no instruction, no homework, or no follow-up schedule came from the schools where the children were registered. The mothers added that there was no distance education suitable for their children. Their children were disconnected from the lesson. They were constantly playing games on the tablet, watching TV and music channels during this period. They also said that the bedtime changed, and breakfast and meal times have changed with the change of the bedtime. This situation negatively affected their lives and there were constant turmoil and endless work at home. They emphasized that an irregular lifestyle made their children nervous, unconcerned, and purposeless. Mothers stated that they adjusted their children's bedtime after FEIP and that their children were happier and calmer because they got enough sleep. They also added that they created daily routines according to their family dynamics, they supported the routines with visuals, children did not have problems in the transition from one activity to another, and their children followed the instructions with the help of FEIP. They emphasized that the time children spend on the tablet and television decreased to a maximum of 2 hours a day. Mothers also underlined that they could have spare time at home and managed to do all the work at home on time after FEIP.

Regarding this sub-theme, Mother 4 has explained her thoughts with these words:

> *"Zeliha is my second child, I do not remember how I raised my other daughter, but Zeliha exhausted me when the school was closed. She did not drop the tablet from her hand, when I told her not to lay with the tablet, she was obstinate with me, shouted at me, but I learned how to talk to the children with this education. We decided on the rules in the house together and she followed all the rules. She warned me when I didn't follow the rules".*

Strengthening Family Relations

The mothers who participated in the study stated that their spouses could not look after their children because they worked very hard in their normal life and came home late. Therefore, they added that the children's communication with their fathers was less, they could not spend quality time together, and they only spent time watching TV and eating. After FEIP, mothers explained to their spouses how to communicate with their children and how to do activities together. The mothers asked the fathers to do activities according to the interests of their children and stated that the fathers did all the activities they chose (for example; making bread, mini farming on the balcony, etc.) with their children. Three of the mothers (Mother 1, Mother 3 and Mother 4) emphasized that when they said to their spouses that the researcher wanted these activities to be done with fathers and children, the fathers never objected and the whole process was easier. Mothers also stated that they started to get to know their children better, their communication with their children was stronger, they were more affectionate, and children's unwanted behaviours such as stubbornness and yelling decreased. Mothers added that they organised mother and child time on a subject that has a common interest for them and their children, started to love their children more and feel like mothers rather than teachers or carers.

The researcher has stated in her diary about this sub-theme that;

> *"As mothers get to know their children better, their discourses and behaviours change. The message we want to give to the mothers by determining the routines together is that the child will be more compatible and more participatory if you let them express their ideas and opinions about the activity that the child will participate in".* (Researcher's diary, December 8, 2020)

Regarding the sub-theme, mother 2 said:

> *"When I took the tablet from her hand, she would yell... As the girl shouted, her father shouted more. I was straddling the fence, but now everything has a time and order. I explain everything clearly, and she understands. I used to be angry with myself. It turns out that I did not know how to speak. I always accused the child. She understands when I explain it properly".*

When it comes to sibling-C/MD interaction, mothers stated that they do not have a normal sibling relationship and the siblings always act as a mother and carer. After FEIP, they started to play box games together, spend time in the kitchen, and the normally developing children started to introduce C/MD to their friends.

Regarding the issue, Mother 1 said:

> *"I knew that my normal daughter was my biggest assistant because there are three disabled children at home. However, it turned out that my daughter was like the mother of my disabled children, so I regretted putting such a burden on her at that age. With this education, I also assigned tasks to my disabled children at home. Even though they did not know exactly, they played monopoly with their older sisters, even this is so beautiful".*

Opinions Regarding the Quality and Provision of the FEIP

Under this theme, three sub-themes including the application process, researchers, and suggestion.

Application Process

The mothers stated that they were very surprised when they learned that their education was prepared according to their own needs. They said that they were very nervous and stressed at the beginning because they would attend a virtual education for the first time. They emphasized that since the activities were understandable, organized according to their level and could be implemented with the materials available at home, their motivation to participate in education increased. Moreover, they said that the education hours were planned at a convenient time for all mothers, which increased participation. Mothers stated that it is very beneficial to participate in the education with groups of two since they could talk to each other about their children and gave suggestions. They also added that it might be more effective to use learning resources such as brochures, printed materials, booklets instead of online materials sent via WhatsApp.

Regarding this sub-theme, the researcher has stated in her diary that:

> *"We just completed the 5th Session… Mothers learned how to decide the routines and plan the day with their children. In the question and answer part at the end of the session, they talked about how they would implement what they learned that day and gave each other… With each new information they learn, the smile on their faces increases".* (Researcher's diary, November 21, 2020)

Mother 2 expressed her thoughts about FEIP with these words:

> *"My problems are solved on the day and time I am available by the expert … what more could I want, everything is special for me". Mother 3 expressed her thoughts about learning resources with these words: "We were not used to reading anything from the phone, I wish we had a book, it would have been better".*

Researcher

Regarding the researcher, it was stated that the researcher was very punctual, took notes for everything, and followed up the tasks and activities given to the families. In addition, it was emphasized by the mothers that the researcher sometimes spoke about the problems she experienced during the isolation period and this made the families not feel alone. Another underlined point by the mothers was that the researcher asked the mothers

whether any issues were not understood or desired to be repeated after each session, and they said that this showed the fact that the researcher did this job in a loving and disciplined manner. Furthermore, the mothers stated that the researcher was an objective and thoughtful person since the researcher acted in accordance with the education levels of the mothers and the socio-cultural structures they had.

Regarding this sub-theme, Mother 4 said:

> *"We are doing whatever she (researcher) says; she is like an invisible hand in our home. Even when my husband was reluctant, I told him that the teacher wanted us to do it, then it is indisputable, and now home is peaceful".*

Suggestions

Mothers stated that FEIP sessions were progressing systematically. They got all the necessary information during the isolation period and could transfer it to their lives after the education was over. However, mothers needed a permanent person who could support them on issues they could not solve or give approval for the activities they did. In addition, mothers suggested that other interventions should be organized for different subjects, such as helping their children with their lessons, communicating with the teacher, and legal matters.

Regarding the sub-theme, mother 4 expressed her thoughts with these words:

> *"I continue the activities even if the education is over, but I think it will be good if our teacher says you are doing it right or it will be better to do this way".*

Discussion

This study aimed to identify the contribution of FEIP to the mothers having C/MD during the COVID-19. In other words, this multiple case study implemented in a region located in Turkey investigates the potential of a support model called FEIP aimed at promoting the educational, organizational, and behavioural management skills of four mothers forced by circumstances into undertaking a role that in the modern world is largely delegated to educators. In this part, the findings are compared with the literature and discussed.

Although determining the needs of the families having children with special needs has been important for all times (Cavkaytar et al., 2014), it has been seen that it is essential, especially during the pandemic. According to this research finding, it was revealed that the mothers did not know what to do with their C/MD all day at home during the isolation period, they were unhappy and nervous, and they had uncertainties about the process. These findings are in line with the findings of the study of Hawryluck et al. (2004) on the SARS virus and the study of Brooks et al. (2020) on the compilation study with COVID 19. The long and uncertain isolation period can cause psychosocial problems in all individuals (Li et al., 2020; Mesa Vieira et al., 2020; Sood, 2020). This situation is more intense and complicated when there is an individual with special needs in the family. In this period, families try to find activities for their individual needs. These activities and efforts also depend on some variables. Some highlighted variables are the socio-cultural and economic levels of families, their physical and psychological health, the number of people at home, the technological knowledge of the person who will conduct home education, and the availability of the necessary technological infrastructure at home (Fisher et al., 2020; Ghosh & Parish, 2013). The mentioned variables affect family members' daily, social, and business lives, so it becomes evident that families should be supported in times of crisis (Hart et al., 2020). FEIP has been planned in the COVID-19 period within the framework of all measures and the dynamics that have the potential to affect the intervention process (Hanson & Espinosa, 2016). It was revealed that the mothers' life flow changed positively, their positive parenting skills improved by receiving systematic education, they realized their children's strengths, and they coped with the difficulties more easily. These findings are in parallel with the results of several studies done by Sardohan Yıldırım (2017) and Yates (2012). As a result, systematic family education is essential to ensure parents' effective participation in the education process in extraordinary situations like pandemics. Consequently, it is revealed that the difficulties experienced in educating students living with multiple disabilities in 'normal' times have been exacerbated by the complex challenges for parents endeavouring to educate their children at home over the last nine months.

Mothers made suggestions to each other and made comparisons in intervention sessions. This helped mothers increase their motivation, implement the activities they learned, and continue the activities even after the intervention ended. The relevant literature (Tomris& Diken, 2021; Kaiser & Hancock, 2003; Sardohan Yıldırım,

2017) states that all families have learned current and effective strategies and methods to support their children's developmental processes, but that some of these families may not be ready and volunteer to implement the learned strategies and methods. In this study, the mothers showed high motivation to participate in the intervention and volunteered to apply what they learned. Education providers should keep in mind that while it is difficult for all learners and families to implement the curricula provided online in many countries around the world, the current existential situation during the period COVID -19 has highlighted the enormous challenges of providing a differentiated curriculum for students with learning disabilities, the challenges of which are many.Finally, FEIP, which was effective for the mothers, can help to lessen these challenges.

The mothers received the support of their family members while planning and implementing the activities and asked other family members to lead the practices. Since mothers got the support of their family members, they both felt more competent and self-confident and saw the impacts of the activities faster. Family lives have been positively affected in this context, and communication, interactions, and harmony in family relationships have increased. As it is known, the higher the harmony and quality interaction in families, the higher the harmony, family well-being, and family functions in the family. In the COVID-19 period, problems such as domestic violence, incompatibility, and inequality between women and men emerged more frequently (Fisher et al., 2020; Kumar & Casey, 2020). This period has evidently placed primary caregiver/s under enormous strain, typically mothers whose workload has increased manyfold, often causing a level of domestic chaos affecting the lives of all family members. Based on these findings, FEIP revealed that changes in mothers could affect the well-being of all family members and prevent negative situations such as domestic violence and psychosocial crisis. In crisis periods such as COVID-19, it is recommended to carry out technology-based development of preventive practices, which will be implemented, by governments and staff working in the field of health and education (Zhou et al., 2020). The family members except for mothers who participated in the research did not receive any education before and after FEIP, so FEIP helped the mothers increase their positive parenting skills, feel competent and successful, and cope with maternity stress.

During the COVID-19 period, the routines were broken, the children became uncertain with the closing of their schools, became aimless, and did not know what to do. Mothers emphasized that the bedtime of their children who spend their entire day at home changed and they became addicted to the screen. These unwanted behaviours are also mentioned in several studies in the literature (Courtenay, 2020; Turk & McDermott, 2020). The FEIP revealed that C/MD had a certain routine, their screen dependency decreased, and they had positive interactions with their fathers and siblings. The positive changes in C/MD are reflected in the family life. At this point, it is important to identify the family dynamics and the issues that they have difficulties in order to make their lives easier and create new routines. Parallel to the findings of other studies in the literature (Buzzi et al., 2020; Courtenay & Perera, 2020), it is revealed that children adapted the new routines easily with the help of the routines created according to the COVID-19 restrictions in this research.

During the implementation of FEIP, mothers worked in collaboration with the researcher. The researcher prepared the needs assessment form to understand and have good communication with the mothers. Moreover, the researcher asked the parents about their children's interests, strengths, and issues in a manner that the mothers will understand clearly without prejudice. Similar to the findings of this research, Brody (2015) also underlined that respecting families will make them feel valuable, make them strong, and improve their positive parenting skills. Similarly, Hanson and Espinosa (2016) underlined that this kind of interventions should be carried out with mutual respect, sensitivity to cultural values, open communication, awareness of individual differences, and competencies.

Bronfenbrenner (1979) stated that human existence is largely determined by its systems and the way these systems interact with each other. Therefore, the development of the child is affected by a process based on the relationship and interaction within the context itself, and the relations and interactions between these contexts. The findings highlighted some crucial issues that surfaced through the intervention, notably the significance of the research, the opportunities for mothers to engage in dialogue, the promoting of the women's competence, the issue pertaining to sustained support, and the relationship of the intervention to enabling the family fabric to be more cohesive. In short, it can be concluded that the application of the model made a significant difference. Moreover, it is thought that this study potentially had an important contribution to make in considering how mothers might be enabled to maintain a balanced lifestyle despite the pressures of sustaining educational access for their children, particularly for those who live with multiple difficulties.

Recommendations for Future Research

In further research, more mothers having children with different disabilities can participate. Fathers and siblings can also be included in the research. Similar interventions can be planned for different needs of families, such as health, psychology, sociological needs of the families for their children with special needs

Conclusion

Mothers realized the strengths of their children with MD. Mothers' positive parenting skills increased. Mothers felt competent in their children's daily routines during the COVID-19 period. Mothers learnt rules that C/MD should follow during the isolation period.

Acknowledgements
The authors would like to thank the families who participated in the study and as well as the Prof. Dr. Gönül Akçamete and Assoc. Prof. Dr. Dolunay Sarıca for contributing the article with their in-depth knowledge.

Author(s) Contribution Rate
The authors confirm equal contribution to the paper.

Conflict of Interest
Authors have no conflict of interest to report.

Ethical Approval
Ethical appoval was taken from Social and Human Sciences Scientific Research and Publication Ethics Board of Akdeniz University (Decision Date: 16.10.2020, Decision Number: 200).

References

Ansari, M., & Yousefabad, S. A. (2020). Potential threats of COVID-19 on quarantined families. *Public Health, 183*, 1. doi:10.1016/j.puhe.2020.04.014

Axelsson, A. K., Granlund, M., & Wilder, J. (2013). Engagement in family activities: a quantitative, comparative study of children with profound intellectual and multiple disabilities and children with typical development. *Child: Care, Health and Development, 39*(4), 523–534. https://doi.org/10.1111/cch.12044

Bourke-Taylor, H., Cotter, C., & Stephan, R. (2015). Complementary, alternative, and mainstream service use among families with young children with multiple disabilities: Family costs to access choices. *Physical and Occupational Therapy in Pediatrics, 35*(3), 311–325. https://doi.org/10.3109/01942638.2014.975312

Brody, J. J. (2015). *Decreasing the pervasive achievement gap between Latino and White students through targeted school-based, family-centered interventions*. [Unpublished doctoral dissertation]. University of Oregon Graduate School

Bronfenbrenner, U. (1979). *The ecology of human development*. Massachusetts: Harvard University Press.

Brooks, S. K., Webster, R. K., Smith, L. E., Woodland, L., Wessely, S., Greenberg, N., & Rubin, G. J. (2020). The psychological impact of quarantine and how to reduce it: rapid review of the evidence. *The Lancet*, 395(10227), 912–920. https://doi.org/10.1016/S0140-6736(20)30460-8

Buzzi, C., Tucci, M., Ciprandi, R., Brambilla, I., Caimmi, S., Ciprandi, G., & Marseglia, G. L. (2020). The psycho-social effects of COVID-19 on Italian adolescents' attitudes and behaviors. *Italian Journal of Pediatrics, 46*(1), 1–7. https://doi.org/10.1186/s13052-020-00833-4

Can, E. (2020). Coronavirüs (Covid-19) pandemisi ve pedagojik yansımaları: Türkiye'de açık ve uzaktan eğitim uygulamaları [Coronavirus (Covid-19) pandemic and pedagogical reflections: Open and distance education applications in Turkey]. *Açıköğretim Uygulamaları ve Araştırmaları Dergisi,* 6(2), 11–53. https://dergipark.org.tr/en/pub/auad/issue/55662/761354

Cavkaytar, A., Ardıç, A., & Aksoy, V. (2014). Aile gereksinimlerini belirleme aracının geçerlik ve güvenirliğinin güncellenmesi. [Revaluation of the Reliability and Validity on the Family Needs Survey]. *Ankara Üniversitesi Eğitim Bilimleri Fakültesi Özel Eğitim Dergisi, 15*(2), 1–12.

Çelebi, Z. İ. (2019). *Reflections of informing parents of children with special needs during the diagnostic and guidance process on transition into special educational services* [Unpublished doctoral dissertation]. Dokuz Eylül University, İzmir.

Cercone, K. (2008). Characteristics of adult learners with implications for online learning design. *AACE Journal, 16*(2), 137–159. Retrieved December 25, 2020 from https://eric.ed.gov/?id=EJ805727

Chang, G.-C., & Yano, S. (2020). How are countries addressing the Covid-19 challenges in education? A snapshot of policy measures. In *World Education Blog*. https://gemreportunesco.wordpress.com/2020/03/24/how-are-countries-addressing-the-covid-19-challenges-in-education-a-snapshot-of-policy-measures/

Courtenay, K. (2020). Covid-19: Challenges for people with intellectual disability. *The BMJ, 369*. https://doi.org/10.1136/bmj.m1609

Courtenay, K., & Perera, B. (2020). COVID-19 and people with intellectual disability: Impacts of a pandemic. *Irish Journal of Psychological Medicine*, 1–21. https://doi.org/10.1017/ipm.2020.45

Creswell, J. (2013). *Qualitative, quantitative, and mixed methods approaches. In Research design*. Sage publications. https://doi.org/10.2307/3152153

Daniel, S. J. (2020). Education and the COVID-19 pandemic. *Prospects*, 1–6. doi: 10.1007/s11125-020-09464-3

Drew P., & Heritage J. (1992). Analysing talk at work: An introduction. In P. Drew, & J. Heritage (Eds.), *Talk at work* (pp. 3–65). Cambridge University Press.

Eldeniz Çetin, M., & Sönmez, M. (2018). Identification of the problems experienced by mothers with children with multiple disabilities. *Elementary Education Online, 17*(3), 1252–1267. https://doi.org/10.17051/ilkonline.2018.466339

Esentürk, O. K. (2020). Parents' perceptions on physical activity for their children with autism spectrum disorders during the novel Coronavirus outbreak. *International Journal of Developmental Disabilities*, 1–12. https://doi.org/10.1080/20473869.2020.1769333

Fisher, J., Languilaire, J.-C., Lawthom, R., Nieuwenhuis, R., Petts, R. J., Runswick-Cole, K., & Yerkes, M. A. (2020). Community, work, and family in times of COVID-19. *Community, Work & Family, 23*(3), 247–252. https://doi.org/10.1080/13668803.2020.1756568

Ghosh, S., & Parish, S. (2013). Prevalence and economic well-being of families raising multiple children with disabilities. *Children and Youth Services Review, 35*(9), 1431–1439. https://doi.org/https://doi.org/10.1016/j.childyouth.2013.05.018

Hanson, M., & Espinosa, L. (2016). Culture, ethnicity, and linguistic diversity: Implications for early childhood special education. In Reichow B., Boyd B., Barton E., Odom S. (eds) *Handbook of early childhood special education* (pp. 455–471). Springer, Cham. https://doi.org/10.1007/978-3-319-28492-7_24

Hart, J. L., Turnbull, A. E., Oppenheim, I. M., & Courtright, K. R. (2020). Family-centered care during the COVID-19 era. *Journal of Pain and Symptom Management, 60*(2), 93–97. https://doi.org/https://doi.org/10.1016/j.jpainsymman.2020.04.017

Hawryluck, L., Gold, W. L., Robinson, S., Pogorski, S., Galea, S., & Styra, R. (2004). SARS control and psychological effects of quarantine, Toronto, Canada. *Emerging Infectious Diseases, 10*(7), 1206–1212. https://doi.org/10.3201/eid1007.030703

Kaiser, A. P., & Hancock, T. B. (2003). Teaching parents new skills to support their young children's development. *Infants and Young Children, 16*(1), 9–21. https://doi.org/10.1097/00001163-200301000-00003

Kumar, S., & Casey, A. (2020). Work and intimate partner violence: powerful role of work in the empowerment process for middle-class women in abusive relationships. *Community, Work and Family, 23*(1), 1–18. https://doi.org/10.1080/13668803.2017.1365693

Li, S., Wang, Y., Xue, J., Zhao, N., & Zhu, T. (2020). The impact of covid-19 epidemic declaration on psychological consequences: A study on active weibo users. *International Journal of Environmental Research and Public Health, 17*(6:2032), 1–9. https://doi.org/10.3390/ijerph17062032

Luijkx, J., van der Putten, A. A. J., & Vlaskamp, C. (2019). A valuable burden? The impact of children with profound intellectual and multiple disabilities on family life. *Journal of Intellectual and Developmental Disability, 44*(2), 184–189. https://doi.org/10.3109/13668250.2017.1326588

Majnemer, A., Shikako-Thomas, K., Shevell, M. I., Poulin, C., Lach, L., Schmitz, N., & Law, M. (2013). Pursuit of complementary and alternative medicine treatments in adolescents with cerebral palsy. *Journal of Child Neurology, 28*(11), 1443–1447. https://doi.org/10.1177/0883073813488942

Mednick, M. (2007). *Supporting children with multiple disabilities*. Continum International Publishing Group.

Merriam, S.B., & Caffarella, R.S. (1999). *Learning in adulthood* (2nd ed.). Jossey-Bass.

Mesa Vieira, C., Franco, O. H., Gómez Restrepo, C., & Abel, T. (2020). COVID-19: The forgotten priorities of the pandemic. *Maturitas, 136*, 38–41. https://doi.org/10.1016/j.maturitas.2020.04.004

Nakken, H., & Vlaskamp, C. (2007). A Need for a taxonomy for profound intellectual and multiple disabilities. *Journal of Policy and Practice in Intellectual Disabilities, 4*(2), 83–87. https://doi.org/10.1111/j.1741-1130.2007.00104.x

Narzisi, A. (2020). Handle the autism spectrum condition during coronavirus (Covid-19) stay at home period: Ten tips for helping parents and caregivers of young children. *Brain Sciences, 10*(4:207), 1–4. https://doi.org/10.3390/brainsci10040207

Reimers, F.M. & Schleicher, A. (2020). *A framework to guide an education response to the COVID-19 Pandemic of 2020*. OECD 2020. https://globaled.gse.harvard.edu/files/geii/files/framework_guide_v1_002.pdf

Pfefferbaum, B., & North, C. S. (2020). Mental health and the Covid-19 pandemic. *New England Journal of Medicine, 383*(6), 510–512. doi: 10.1056/NEJMp2008017.

Qi, F., & Hu, L. (2020). Including people with disability in the COVID-19 outbreak emergency preparedness and response in China. *Disability and Society, 35*(5), 848–853. https://doi.org/10.1080/09687599.2020.1752622

Sardohan Yildirim, A. E. (2017). *Examining the process of strengthening families of children with multiple disability via family centered education model* [Unpublished doctoral dissertation]. Ankara University, Ankara.

Sood, S. (2020). Psychological effects of the Coronavirus disease-2019 pandemic. *Research & Humanities in Medical Education, 7*, 23–26. https://www.rhime.in/ojs/index.php/rhime/article/view/264

Tomris, G. & Diken, I.H. (2021). The Effectiveness of an Early Intervention Program Developed based on Naturalistic Teaching Processes (DÖDEM) for Children with Down Syndrome and Their Families in Turkey. *International Journal of Progressive Education,* 17(1), 479-497. doi: 10.29329/ijpe.2021.329.30

Turk, M. A., & McDermott, S. (2020). The COVID-19 pandemic and people with disability. *Disability and Health Journal, 13*(3). https://doi.org/10.1016/j.dhjo.2020.100944

Van Timmeren, E. A., van der Putten, A. A. J., van Schrojenstein Lantman-de Valk, H. M. J., van der Schans, C. P., & Waninge, A. (2016). Prevalence of reported physical health problems in people with severe or profound intellectual and motor disabilities: a cross-sectional study of medical records and care plans. *Journal of Intellectual Disability Research, 60*(11), 1109–1118. https://doi.org/10.1111/jir.12298

Wang, P., & Michaels, C. A. (2009). Chinese families of children with severe disabilities: Family needs and available support. *Research and Practice for Persons with Severe Disabilities, 34*(2), 21–32. https://doi.org/10.2511/rpsd.34.2.21

World Health Organisation (WHO). (2020). *No Title*. Retrieved December 25, 2020 from https://www.who.int/emergencies/ diseases/novel-coronavirus-2019/events-as-they-happen

Yates, A. (2012). *Supporting parents of young children with severe disabilities: An action research study*. Fielding Graduate University.

Yıldırım, Ş., Karahan, S., Demiröz, K., Şener Ö. & Özaydın, L. (2020). Kovid-19 sürecinde özel gereksinimli çocukların ebeveynlerinin ihtiyaçları [The needs of the parents of children with special disabilities during the Covid-19 outbreak process]. *The Proceeding of International Conference on Covid-19 Studies* (pp. 369–370).

Yin. R. K. (2014). *Case Study Research Design and Methods* (5th ed.). Thousand Oaks, CA: Sage.

Zhang, J., Shuai, L., Yu, H., Wang, Z., Qiu, M., Lu, L., Cao, X., Xia, W., Wang, Y., & Chen, R. (2020). Acute stress, behavioural symptoms and mood states among school-age children with attention-deficit/hyperactive disorder during the COVID-19 outbreak. *Asian Journal of Psychiatry, 51*(102077), 1–3. https://doi.org/10.1016/j.ajp.2020.102077

Zhou, X., Snoswell, C. L., Harding, L. E., Bambling, M., Edirippulige, S., Bai, X., & Smith, A. C. (2020). The role of telehealth in reducing the mental health burden from COVID-19. *Telemedicine and E-Health, 26*(4), 377–379. https://doi.org/10.1089/tmj.2020.0068

Article History
Received: 12.11.2021
Received in revised form: 25.01.2022
Accepted: 26.02.2022
Article Type: Research Article

International Journal of Contemporary Educational Research (IJCER)

www.ijcer.net

The Effect of Teachers' Quality of Work Life on Job Satisfaction and Turnover Intentions

Ramazan Ertürk[1]
[1]Republic of Turkey Ministry of National Education,
0000-0002-8140-0895

To cite this article:

Ertürk, R. (2022). The effect of teachers' quality of work life on job satisfaction and turnover intentions. *International Journal of Contemporary Educational Research, 9*(1), 191-203. https://doi.org/10.33200/ijcer.1022519

International Journal of Contemporary Educational Research
Volume 9, Number 1, March 2022, 191-203 ISSN: 2148-3868

The Effect of Teachers' Quality of Work Life on Job Satisfaction and Turnover Intentions*

Ramazan Ertürk[1**]
[1]Republic of Turkey Ministry of National Education

Abstract

The purpose of this is to determine the relationships between teachers' quality of work, job satisfaction, and turnover intentions. The relational survey model with quantitative research design was used for the study. The sample of the study composed of 368 teachers working in primary schools in the central district of Bolu, Turkey.In the study, the scale of teachers' quality of work; the scale of the turnover intentions and the scale of job satisfaction were used. Parametric tests were used in the research as the data were suitable for normal distribution. According to the findings, teachers' perceptions of the quality of work are moderate in the whole scale in terms of career satisfaction, stress in work life, working conditions, and work-family life balance dimensions and weak in terms of self-control over the work higher than the overall well-being. It is significant that teachers do not have enough self-control over their work. The fact that teachers' perceptions of job satisfaction and turnover intentions are moderate should be considered although the intentions of teachers to leave work are not high. There is a strong positive relationship between all dimensions except for the whole scale of teachers' quality of work and the dimensions of stress in work life and job satisfaction; a moderate negative relationship between the dimensions of stress in work life and job satisfaction; a high level of negative relationship between the scale of quality of work and all dimensions except for the dimensions of stress in work life and the turnover intention; a positive high relationship between the dimensions of stress in work life and turnover intentions. The quality of work and all dimensions are the predictors of job satisfaction and turnover intentions.

Keywords: The quality of work, Job satisfaction, Turnover intentions, Teacher.

Introduction

The effectiveness and efficiency of the organizations created to achieve certain objectives depends on the care for employees. Creating positive work conditions reveals the importance of humanitarian conception in organizations, ensuring employees' job satisfaction of employeespositive work conditions reveals the importance of humanitarian conception in organizations, ensuring employees' job satisfaction, working in a safe environment and having self-control over their work. Furthermore, the employees working in positive work conditions improve work quality. Creating a positive work environment for teachers, which is essential for schools, will have a positive impact on their job satisfaction and thus improve their performance. Teachers who perceive a high quality of work do not consider leaving their school, so their intentions to change are low. Consequently, the quality of teachers' work is critical in many ways.

People spend a long period of their lives in work environments. The quality of these working conditions increases their motivation and makes them feel good about themselves. Minimizing these problems in the work-life and increasing the efficiency of the organizations has emerged the concept of teachers' quality of work. Today, quality of work life covers issues such as balancing between jobs and people in modern work life, having a self-control over work, job safety, reward, career path (Arslan, 2018). The quality of work of teachers is a concept that requires the improvement of working conditions, job satisfaction, productivity and social

* The short text of this research was presented as an oral presentation at the 12. International Education Management Form held in Ankara between 8-12 September 2021.

**Corresponding Author: *Ramazan Ertürk, koroglu522@hotmail.com*

balance (Aba, 2009); a technique that aims to create better working conditions by making changes in the current work environment and contributing to the improvement of the quality of life, while increasing the productivity of the organization and trying to increase the skills of people working in the organization and ensure their satisfaction (Erginer, 2003); a physical and psychological well-being in the work environment in a way that leads to the integration of employees with the whole work environment (Bilgin, 1995). The quality of teachers' work directly affects the evaluation of working conditions, employee satisfaction and dissatisfaction, productivity, the social environment in the organization, management style, and the relationship between work life and social life (Martel & Dupuis, 2006).Teachers' quality of work keeps employees in the organization and the sustainability of employees (Sandrick, 2003).

Teachers' quality of work can improve the performance and job satisfaction of the employees at work by organizing the working conditions. Teachers working under unfavorable conditions and with excessive workload reduce their work quality. (Demir, 2016). Employees spend most of their time at work and their productivity increases in line with their job satisfaction (Yalcin, 2014). Employees working under favorable conditions can improve their commitment to the job and perform at a high level at their work (Aydın, 2006). The fact that employees influence the organization's performance has emerged the necessity of teachers' quality of work. It can be concluded that the organization's effectiveness is directly related to the performance of the employees. Many factors such as wages, working conditions and career opportunities in the workplace can provide job satisfaction. The productivity and effectiveness of the employees may be high when job satisfaction achieved (Demir, 2019).

As necessary and important as it is for teachers to be qualified, it is not enough alone because it is required for the teachers to be employed equally, effectively, and efficiently at the country level as well as an improvement in their quality of work (Dilaver, 1996). School environments where teachers' quality of work is not favorable can affect the teachers' performance and the relationships, motivations, job satisfaction, commitment to the organization, and work-life balance (Barker, 1986; Bolduc, 2002). Teachers, who have important duties and responsibilities for the efficiency and effectiveness of the school by successfully carrying out the activities at the school, must be provided with job satisfaction, general well-being, self-control over their work, no or less stress, good working conditions, and the opportunity to balance their family and work lives in order to have an adequate quality of work life.

In this study, employees' quality of work life was considered as six behavioral dimensions, namely career satisfaction, general well-being, ability to control work, stress in work life, working conditions and family-work life balance developed by Van Laar, Edwards and Easton (2007). Job and career satisfaction is the level of happiness experienced by meeting the wishes and needs of the employees in the working environment (Cook, 2008) and ensuring their career development. While general well-being and subjective well-being generally mean happiness, relaxation and the relative absence of problems, psychological well-being is defined as challenging, making an effort, and striving for individual development (Waterman, 1993). Being able to control the work is the ability of employees to have self-control over their work and to do their work independently (Ertürk, 2020). Employees have control over their work positively affects their health, well-being and quality of work life (Rethinam & Ismail, 2008). Stress in business life is the reaction of the organism to the pressure it encounters intensely (Genç, 2005). In case of excessive stress, both psychological and physiological diseases and disorders will occur in the person, and in this case, performance can be decreased (Işıkhan, 2004). It indicates conditions such as working conditions, workload, class sizes, salary and status, behavior and motivation problems of students, availability of sufficient resources, and manager and colleague support. The insecurity of the working environment increases the productivity, absenteeism, and employee turnover of the employees and decreases their organizational commitment (Fatimah, Noraishah, Nasir & Khairiddin, 2012). Family-work life balance is the consideration of work life and private life together. The transfer of positive and negative emotions that occur at work to the home defines it as emotional overflow. Negative overflows in an individual's work life negatively affect the time he needs to spend with his family, disrupting the balance of work and non-work life (Bartelome & LeeEvans, 2001).

The fact that school administrators and teachers are committed to the school and their work, that they are satisfied with their work, that they can manage stress and burnout, that they build strong and effective relationships with students, parents and colleagues, in short, that they have a high quality of work, can be considered as the most important factor for success (Erdem, 2008). In this sense, it is believed that the quality of teachers' work will influence their job satisfaction.

Job satisfaction is a feeling that a worker experiences when he realizes that his work and what he does intersects or intersects with his needs and personal value judgments (Barutçugil, 2004), the individual's appreciation of his

work or work life as a situation, that produces a satisfying or positive feeling (Luthans, 2011), a combination of feelings and thoughts toward the job as a result of the employee's perception of his or her self-esteem and what he or she gets in return (Akehurst, Comeche & Galindo, 2009).Job satisfaction is vital for employees. It is possible for organizations to achieve the objectives, ensure the job satisfaction of employees, and improve the quality of life of the employees. Improving the quality of work can be achieved by regulating working conditions and working environment, meeting the psychological, economic, and social needs of employees, and minimizing the problems that will emerge in work life (Gürsel, Izgar & Altınok, 2003). With the presence of job satisfaction, employees' self-esteem, motivations, performance, and productivity levels will be increased. Thanks to these positive aspects, negative issues such as stress, anxiety, complaints, and tension will be decreased (Akşit Aşık, 2010). In cases where job satisfaction cannot be achieved, negatives outcomes such as poor performance, absence and turnover intentions can be experienced (Luthans, 2011). Job satisfaction is one of the most significant factors among organizational behaviors in that an individual with a high job satisfaction will have positive attitudes and behaviors regarding the work he/she carries out (Gamsız, Yazıcı & Altun, 2013). Employees with positive attitudes and behaviors will also have fewer turnover intentions because employees with a high job satisfaction do not have problems concerning turnover intentions, absence, late arrival to work, etc. (Hayes, Pallas & Duffield, 2006).

Turnover intention is an employee's plan and consideration to leave the current job at a certain time (Fong & Mahfar, 2013), an intention to voluntarily change jobs or organizations (Schyns, Torka & Goessling, 2007), a tendency to leave an organization of one's own accord (Gaertner, 1999), an employee's cognitive response to an organization's working conditions (Rainayee, 2012); an employee's intention or desire to leave the organization in which he or she is employed (Liu & Onwuegbuzie, 2012). Employees are likely to believe that it is more beneficial for them to leave the organization and look for another organization or job if they are dissatisfied with the current job, expectations are not met (salary, promotion, peer group, attitude of the school management, organizational culture, etc.), the organization and the employer are not satisfied), the inability of the organization and the individual to achieve common goals (Yücel & Koçak, 2018). The turnover intention is described as a case of employees not willing to work more in the organization they already work for. The turnover intentions can be prevented organizationally. Some improvements to the employee's conditions will ensure that the employee's turnover intention is eliminated (Ercan, 2016). While factors such as job satisfaction, job opportunities, investments, rewards, and penalties, etc. are among the factors that prevent turnover intentions (Gül, Oktay & Gökçe, 2008), wages, career and promotion opportunities, profession, stress and working conditions are among that induce turnover intentions among employees (Gün, 2006).The employee who has turnover intention will be more insensitive to some of the negative work practices that he has endured for various reasons before and will have a negative impact on the organization by being more irresponsible towards both his managers and his colleagues (Şevik, 2019). The turnover intentions will lead to the need for urgent employment, the loss of trained employees who have adapted to the organization, demoralization, and low motivation in other employees (Çakır, 2001) and therefore organizational productivity will decrease.

The turnover intention in educational organizations means a teacher's desire to leave the teaching profession (Liu & Onwuegbuzie, 2012). Qualified teachers are directly related to improving students' performance and the future success of the education system, as they have a critical role in improving the entire educational processes and their contributions to improving students' academic achievement (Borman & Dowling, 2008). This can also negatively affect the quality of teaching, as the intention of teachers to leave the teaching profession may lead to less teaching efforts (Ingersoll, 2001; Shapira-Lishchinsky, 2012). Teachers' job satisfaction can increase the quality and quality of education and training services offered to students. Because teachers can provide an effective and efficient service through their job satisfaction. Job satisfaction affects teachers' work and social life and their physical and psychological health and productivity (Yılmaz & Ceylan, 2011). In this sense, it can be said that the job satisfaction of teachers, who are at the center of education and training services, is very important in achieving the school's goals. Therefore, it would be useful to investigate the effect of quality of work life on teachers' turnover intentions and job satisfaction.This fact exhibits the importance and authenticity of the research. Therefore, this study aimed to determine the effect of teachers' quality of work life on their job satisfaction and turnover intentions. For this purpose, the following questions were determined to seek for answers:

1. What is the level of teachers' perceptions of quality of work, turnover intention, and job satisfaction?
2. Are there statistically significant relationships between teachers' quality of work, turnover intention, and perceptions of job satisfaction?
3. Are teachers' perceptions of quality of work predictors of their intentions and job satisfaction?

Method

Research Model

The research was designed in the relational survey model, which is one of the quantitative research methods. The purpose of the relational survey model is to determine the existence of a change between two or more variables to determine whether the variables change together and if there is a change, how (Karasar, 2011). In addition, it aims to determine the thoughts and attitudes of the participants in the survey models and determine the level of the relationship between the variables by regression analysis (Balcı, 2013). In this context, in the research, the relationship between quality of work-life, job satisfaction and intention to leave work, and the level of predicting the level of work-life quality on teachers' job satisfaction and turnover intention were tried to be revealed.

Participants

The participants of the study are 425 teachers who work at primary schools in the center of Bolu, Turkey. The participation of teachers was on a volunteer basis and 368 teachers provided feedbacks. Since all the participants were contacted in the scope of the study, no samples were taken.

Data Collection Tools

In the study, the data were collected using the scale of teachers' quality of work, the scale of job satisfaction and the scale of turnover intention.

The Scale of Teachers' Quality of Work

The scale developed by Van Laar et al. (2007) was adapted to Turkish culture by Akar and Üstüner (2017). The scale consisting of 23 items and six dimensions (job satisfaction, general well-being, self-control over work, stress at work, working conditions, and work-life balance) was calculated by Akar and Uestuener (2017) using Cronbach's alpha coefficients across the dimensions and the total scale as follows: .78 in the dimension of job satisfaction; .79 in the dimension of general well-being; .89 in the dimension of self-control over work; .70 in the dimension of work-life stress; .80 in the dimension of working conditions; .91 in the dimension of work-family balance; .93 in the total score of the teachers' quality of work scale.. In this study, the Cronbach alpha coefficients for the dimensions and the total scale were 80 for the job satisfaction dimension, .81 for the general well-being dimension, .88 for the self-control over work dimension, .74 for the work life stress dimension, and .82 for the working conditions dimension, .90 for the work-life balance dimension, and .92 for the total teacher work quality scale score.The scale, which was developed as a 5-point Likert type, was graded as Disagree (1), Agree Little (2), Agree Moderately (3), Agree Mostly (4), Strongly Agree (5). Some of the items of the scale are as follows: "The career opportunities available at my school make me happy", "My school administrator provides everything necessary for me to do my job effectively", I am included in the decisions that affect me at my school."

Job Satisfaction Scale

Developed by Ho and Au (2006) and adapted to Turkish by Demirtaş (2010), the job satisfaction scale consists of 5 items and one dimension. The Cronbach Alpha coefficient of the scale was calculated as .84 by Demirtaş (2010). As a result of the reliability analysis of the scale, the Cronbach Alpha coefficient was calculated as .86. The scale was developed in a 5-point Likert type style; Strongly Disagree (1), Disagree (2), Moderately Agree (3), Agree (4), Strongly Agree (2) rated as. Some of the items of the scale are as follows: "I have the conditions required to be a teacher at an excellent level", "I have achieved important achievements so far and I want to stay as a teacher", "I am satisfied with being a teacher."

The Scale of Turnover Intentions

Developed by Cammann and his colleagues (1979) and adapted to Turkish by Yapıcı (2008), the scale of the turnover intentions consists of one dimension and three items in 5-type Likert scale. The scale is rated as Strongly Disagree (1), Disagree (2), Neutral (3), Agree (4), Strongly Agree (5). As a result of the reliability analysis, the Cronbach's alpha value of the turnover intention questionnaire was calculated to be .88 and the factor loading of the scale was calculated to be over .40 (Yapıcı, 2008).Within the scope of these results, it can be determined that the reliability of the scales is high. Evaluation intervals of the scales are Very Low (1.00-

1.80); Low (1.81-2.60); Moderate (2.61-3.40); High (3.41- 4.20) and Very High (4.21-5.00). Some of the items of the scale are as follows: "I am thinking of actively looking for a job in the next year", "I often think about quitting my job", "I will probably look for a new job next year."

Data Collection Process- Data Analysis

After obtaining the necessary permissions from the relevant researchers for the scales used in the study, the permission of the Ethics Committee was obtained. The scales were delivered and applied online to 368 teachers who accepted participating in the research. During this process, school administrators were also informed about the study. Three hundred sixty-eight valid data obtained from teachers were transferred to the SPPS program and made ready for analysis.

In the study, the normality of the data was examined by calculating the kurtosis coefficients. Tabachnick and Fidell (2013) stated that the values of kurtosis-skewness between +1.5 and -1.5 correspond to the normal distribution of the data. Based on the fact that the sum of the scale of teachers' work quality (Skewness: -.202; Kurtosis: .681), job satisfaction (Skewness: -.642; Kurtosis: .301), general well-being (Skewness: -.985; Kurtosis: .464), self-control over work (Skewness: -.883; Kurtosis: .416), job stress (Skewness: -.104; Kurtosis: .452), working conditions (Skewness: -.704; Kurtosis: .521), and work-life balance (Skewness: -.688; Kurtosis: .317), and job satisfaction scale (Skewness: -.732; Kurtosis: .502), turnover intentions scale (Skewness: -.851; Kurtosis: 1.026) ranged from +1.5 to -1.5, the data were found to be normally distributed.Therefore, parametric tests were used in the research.

According to the result of the Durbin-Watson coefficient calculated to study the autocorrelation between variables, it was found that there is no autocorrelation between variables (d=1.89).Kalaycı (2009) emphasized that the Durbin-Watson coefficient being between 1.5-2.5 values means that there is no autocorrelation problem between the variables. To examine whether there is a multicollinearity problem in the research, the r coefficients were examined and it was determined that the r coefficients were lower than .90. Field (2009), Tabachnick and Fidell, (2013) stated that the r coefficient between the independent variables should not be 0.9 or higher as a criterion to avoid the problem of multicollinearity. In this sense, it was determined that there was no problem of multicollinearity among the variables. In addition, the Variance Amplification Factor (less than Variance Inflation Factor/VIF:10) and tolerance value (greater than 0.2) of each independent variable for the multicollinearity problem between the independent variables were examined. The VIF value of each independent variable is between 3.36 and 5.07; The tolerance value was found to be between .63 and .91. Field (2009) and Stevens (2009) stated that these obtained values mean that there is no multicollinearity problem between the variables.

Ethical

This research was evaluated and found ethically appropriate at the Ethics Committee of Human Research in Social Sciences, Bolu Abant İzzet Baysal University, at the meeting dated 30.07.2021 and 2021/08

Findings

In this part, the relationships between teachers' quality of work, turnover intentions and their perceptions of job satisfaction, their turnover intentions and their perceptions of job satisfaction, the effect of teachers' perceptions of quality of work on their turnover intentions and job satisfaction and the effects of teachers' job satisfaction on their turnover intentions are included. Accordingly, teachers' perceptions of the quality of work are shown in Table 1.

Table 1. Teachers' Perceptions of The Quality of Work

Scale and Dimensions	N	$\bar{x}$	SS
Career Satisfaction	368	2.89	0.38
Overall Well-being	368	3.56	0.41
Self-control Over the Work	368	2.19	0.53
Stress in Work Life	368	2.73	0.47
Working Conditions	368	3.28	0.36
Family-Work Life Balance	368	3.02	0.29
The Total Score of The Quality of Work	368	3.11	0.33

When table 1 is examined, it is determined that the perceptions of teachers' quality of work are low in the dimension of the self-control over the work (x̃=2.19); moderate in the dimensions of career satisfaction (x̃=2.89), stress in work life (x̃=2.73), working conditions (x̃=3.28) and family-work life balance (x̃=3.02) with the total scale of teachers' quality of work (x̃=3.11); high in the overall well-being (x̃=3.56).These findings show that teachers' perceptions of the quality of work are generally moderate. While the overall well-being of teachers is high; It is remarkable that their perception of stress in work life is moderate.

Teachers' perceptions of job satisfaction and turnover intentions are shown in Table 2.

Table 2. Teachers' Perceptions of Job Satisfaction and Turnover Intentions

Scales	N	$\bar{x}$	SS
Job Satisfaction	368	2.81	0.76
Turnover Intention	368	3.25	0.48

When Table 2 was examined, it was determined that teachers' job satisfaction (x̃=2.81) and perceptions of turnover intention (x̃=3.25) were moderate. These findings indicate that teachers' job satisfaction is insufficient, and their turnover intention exists, if not high. The moderate turnover intentions of teachers can be expressed as undesirable situation at schools because it will be difficult for a teacher with turnover intentions to feel committed to school or to focus on his work.

Pearson Correlation Coefficient results for the relationships between Teachers' quality of work, turnover intention and perceptions of job satisfaction are presented in Table 3.

Table 3. Pearson Correlation Coefficient results for the relationships between Teachers' Quality of Work, Turnover Intention and Perceptions of Job Satisfaction

Scale and Dimensions		Turnover Intentions	Job Satisfaction
Career Satisfaction	r	-.830**	.861**
Overall Well-being	r	-.842**	.791**
Self-control Over The Work	r	-.834**	.814**
Stress in Work life	r	.842**	-.611**
Working Conditions	r	-.751**	.860**
Family-Work Life Balance	r	-.760**	.732**
The Total Score of The Quality of Work	r	-.821**	.801**

*****p <0.05, **p=.000***

**p<0.01: Correlation coefficient as absolute value is high between 0.71-1.00; moderate between 0.70-0.31; and low between 0.30-0.00 (Büyüköztürk, 2011).

Table 3 shows the magnitude and direction of the relationship between teachers' quality of work, perceptions of their turnover intentions and job satisfaction. When the table is examined; it is determined that there are statistically significant relationships between the dimensions of overall teachers' quality of work scale (r=-.821; p<0.05), career satisfaction (r=-.830; p<0.05), overall well-being (r=-.842; p<0.05), self-control over the work (r=-.834; p<0.05), working conditions (r=-.751; p<0.05) and family-work life balance (r=-.760; p<0.05) and turnover intentions in strong negative level; in strong positive levels (r=.842; p<0.05) between the dimensions of

stress in work life and turnover intentions.It is seen that there is a high level of relationship between teachers' perceptions of the quality of work and their turnover intentions.

According to the table, there are statistically significant relationships between the dimensions of overall teachers' quality of work scale (r=.801; p<0.05), career satisfaction (r=.861; p<0.05), overall well-being (r=.791; p<0.05), self-control over the work (r=.814; p<0.05), working conditions (r=.860; p<0.05) and family-work life balance (r=.732; p<0.05) and job satisfaction in positive high level; in moderate negative level (r=-.611; p<0.05) between stress in work life and job satisfaction. There is a high level of relationship between their perceptions of quality of work and their job satisfaction.

Regression results as a predictor of teachers' perceptions of work quality, job satisfaction and Turnover intentions are presented in Table 4.

Table 4. Regression Results As A Predictor of Teachers' Perceptions of The Quality of Work, Job Satisfaction and Turnover Intentions

	Model 1 Dependent Variable Job Satisfaction			**Model 2 Dependent Variable Turnover Intentions**		
Independent Variable	ß	t	p	ß	t	p
Stability	1,13	2,81	0.00*	1,04	2,01	0.00*
Career Satisfaction	0.51	1.63	0.00*	0.42	2.60	0.00*
Overall Well-being	0.62	3.46	0.00*	0.44	4.32	0.00*
Self-control Over The Work	0.84	4.21	0.00*	0.71	3.41	0.00*
Stress in Work Life	-1,41	-2,80	0.00*	-0,37	-1,82	0.00*
Working Conditions	0.83	1.36	0.00*	0.70	2.30	0.00*
Family-Work Life Balance	0.42	3.52	0.00*	0.56	4.18	0.00*
Total Score of Quality of Work	0.77	4.01	0.00*	0.62	3.21	0.00*
		F 86.03			F 81.12	
		p 0.00*			p 0.00*	
		R^2 0.89			R^2 0.83	

According to Model 1 in Table 4, It is determined that the sub-dimensions of the teachers' quality of work scale and the total score of the scale of teachers' quality of work are significant predictor of job satisfaction (F=86.03; p<0.01). The subdimensions of the teacher job quality scale and the total score of the job quality scale explained 89% (R2 =0.89) of the total variance in teachers' perceptions of job satisfaction. The p-values indicate that each of the total scores and dimensions of the teacher job quality scale are statistically significant predictors of job satisfaction (p<0.01). These findings suggest that with the increase in teachers' quality of work, their job satisfaction levels will also increase. It can be said that as the stress experienced by teachers in the work life increases, their job satisfaction will decrease.

Model 2 suggests that the subdimensions and total scales of teachers' quality of work are significant predictors of the turnover intentions (F=81.12; p<0.01). The subdimensions and the total scales of teachers' quality of work explains 83% (R^2 =0.83) of the total variance in teachers' perceptions of turnover intentions. According to p values, it is determined that each of the total scores and dimensions of the teachers' quality of work scale are statistically significant predictors of teachers' intentions (p< 0.01). These findings explain that teachers' turnover intentions will decrease with improved quality of work life. It can be said that the more teachers' stress level increase at work, the more they will have turnover intentions. In other words, teachers' turnover intentions will increase as the teachers' quality of work decreases, and turnover intentions of the teacher will be less with a low level of stress in work life.

Discussion

Teachers' perceptions of the quality of work are moderate in the whole scale, in the dimensions of career satisfaction, stress in work life, working conditions and work- family life balance; low in the self-control over the work; high in overall well-being. Manju (2014), Yalcin (2014), Demir (2016), Swathi and Reddy (2016), Kösterelioğlu (2011) and Çoruk and Karakaya Çiçek (2017) have concluded that teachers' perception of the quality of work is moderate as in the results of this research. İsmetoğlu (2017) and Demir (2019) have suggested

that teachers' perceptions of the quality of work are high. The reason for this difference may be due to the fact that the studies were conducted in different sample groups and in different places. In addition, although the working conditions of the schools and the resources transferred to the schools are similar in general, schools may differ when factors such as the number of students, school management, school environment and school financing are taken into account. This situation may have caused a difference in teachers' quality of work life. It should be considered that teachers with high levels of overall well-being experience stress in their work life because even if the teachers' level of individual well-being is high, stress at schools can refer to an insufficient quality of work life there. In this case, school administrators and experts may recommend taking the necessary precautions in line with the results of scientific research.

Teachers' perceptions of job satisfaction are moderate. Teachers' perceptions of job satisfaction are moderate. There are studies in the literature that conclude that teachers' job satisfaction is at a moderate level and support the results of this research (Yılmaz & Altınkurt, 2012; Demirtaş & Alanoğlu, 2015; Büyükgöze & Özdemir, 2017; Çoruk ve Karakaya Çiçek, 2017; Demirtaş & Nacar, 2018; Sarıkaya; 2019). In addition, some studies (Menziroğlu, 2005; Demirtaş, 2010; Başaran & Güçlü, 2018) found that teachers' job satisfaction is high; In some studies (Sarpkaya, 2000; Köklü, 2012) it was concluded that it is low. Teachers' job satisfaction can be considered as an effective factor for the quality and effectiveness of educational activities. The absence of job satisfaction is one of the reasons for turnover intentions (Ingersoll & Smith, 2003; Makela, 2014). Therefore, high levels of teachers' job satisfaction will reduce their turnover intentions. It will be difficult for a teacher with low job satisfaction and turnover intentions to focus on his work, succeed or perform effectively in the educational process. This will also negatively affect student achievement and the success of the school as well. In addition, it can even cause the teacher personal problems. it is emphasized in the literature that teachers' job satisfaction affects student success (Michaelowa, 2002; Patrick, 2007; Tek, 2014).

Remarkably, teachers' turnover intentions are moderate. Ingersoll (2001), Ingersoll and Smith (2003), Yüksel and Yüksel (2014), have also concluded that teachers have turnover intentions at high levels. Cerit (2015) has also highlighted that teachers' turnover intentions are above average. Töremen and Demir (2016), on the other hand, concluded that teachers' intention to quit their job is at the level of partially agree. The emergence of different results in the studies mentioned may be due to the different sample groups of the studies and the fact that the teachers in the sample group work in schools with different working conditions. In addition, the improvement of teachers' working conditions day by day, the reorganization of the career steps by publishing the teaching profession law, the development of the educational environments offered to teachers, the increase of professional development opportunities offered to teachers, and the more democratic and participatory management of school administrations as a result of improving themselves in line with contemporary developments, teachers' intention to quit their job. may have led to the emergence of different studies. It is emphasized in the literature that one of the most important problems in many countries is the turnover intentions of teachers (Liu & Onwuegbuzie, 2012). Teachers with turnover intentions affect student achievement and the quality of the education system totally (Ingersoll, 2001).

Additionally, teachers' turnover intentions can cost overrun for the organizations (Hsiao, Auld & Ma, 2015). It will be difficult for a teacher with turnover intentions to be efficient for the students. Teachers' turnover intentions lead to a decrease in students' educational qualifications (Liu, 2012), a negative impact on student achievement, inconsistencies in the curriculum, a decrease in the quality of teaching and a negative impact on the effective use of resources (Loeb & Darling-Hammond, 2005). For the sustainability of the organizations, it is important to identify employees with turnover intentions and take necessary steps to find solutions to their problems. Losses should be prevented by determining the internal and external reasons that led to turnover intentions (Yıldırım, 2007). In this sense, this research is essential for school administrators to give them an idea and raise their awareness for taking necessary steps.

There is positive high level of relationship between job satisfaction and all the dimensions except for the dimensions of stress in work life and the overall scale of job satisfaction; moderate negative level of relationships between the dimension of stress and job satisfaction; A high level of negative level of relationships between the scale of teachers' quality of work and all dimensions except for the dimension of stress in work life and the turnover intentions; positively high level between the dimensions of stress and turnover intentions; a moderate negative relationship between job satisfaction and turnover intentions. Although there are few studies in the literature on the relationships between quality of work life, job satisfaction and intention to leave, there is a positive relationship between quality of work life and job satisfaction (Bhavani & Jegadeeshwaran, 2014; Bhatnagar & Soni, 2015; Hong, Tan & Bujang, 2010; Demir, 2011; Singh & Singh, 2015; Lee, Singhapakdi & Sirgy, 2007; Meng & Wu, 2015; Şangar, 2016; Çoruk & Karakaya Çiçek, 2017; Çelik & Kılıç, 2019; Sarı Karadaş, 2020; Seyhan, 2020; Deveci, 2021); It is possible to come across studies that have concluded that there

is a significant negative relationship between quality of work life and intention to leave (Tuncer, 2012; Lee, Singhapakdi, & Sirgy, 2007; Meng & Wu, 2015) and support the results of this research. Therefore, the results of this study show similarities with the studies in the literature.

The fact that teachers' quality of work affects their job satisfaction positively and decrease their turnover intentions underlines the importance of teachers' quality of work. Therefore, teachers should be provided with offered a higher level of job satisfaction and career opportunities, they should have self-control over their work, in other words, teachers should be able to make important decisions in educational activities professionally, they should be provided with organized classroom environments and workshops, they should have a say in planning, implementation, development and administrative actions of these processes (Ertürk, 2020). When teachers are provided with an environment to perform their job in a comfortable, peaceful manner without stress; their requirements for tools, equipment and materials are met; they are included in the decisions making processes; when school administrators adopt a non-repressive management style and ensure the balance of work and family life of teachers, in other words, when they do not ignore family life in school and evaluate the school and family life together, care about these two living spaces of the teacher equally, the job satisfaction of the teachers will increase and it will contribute to the reduction or prevention of the turnover intentions.

Teachers' quality of work and all dimensions are statistically significant predictor of both job satisfaction and turnover intentions. In this context, as teachers' quality of work increases, their levels of job satisfaction will rise, and the turnover intentions will decrease. On the other hand, all dimensions of teachers' quality of work and the overall scale emerge as statistically significant predictor of teachers' job satisfaction and turnover intentions. In this regard, the quality of work life has a high level of impact, among other factors, on ensuring teachers' job satisfaction and preventing or minimizing their turnover intentions. Therefore, it would be wrong to ignore teachers' quality of work at schools. Interestingly, there are limited number of studies on teachers' quality of work, so these results are crucial for giving ideas to administrators and experts. Therefore, this study can be considered as an original research. Studies in the literature (eg., Padler, Burgoyne & Boydell, 2001; Waitayangkook, 2003; Preffer, 2004; Kheirandish, 2009; Akar & Üstüner, 2017) supports the results of this research, that the quality of work life increases the organizational productivity and effectiveness of employees as well as positive behaviors such as forming organizational identity, and increasing professional performance, job satisfaction and professional initiatives and they emphasize that absenteeism, turnover intention and burnout reduce their standard of living.

Conclusion

This study determined the effect of teachers' work quality on job satisfaction and turnover intentions and the effect of job satisfaction on turnover intentions. As a result, it was suggested that teachers' quality of work influences both job satisfaction and turnover intentions. Given that teachers' perceptions of the quality of work, job satisfaction and turnover intentions are moderate, improving teachers' quality of work will increase their job satisfaction and reduce their turnover intention. In this context, necessary precautions should be taken at the district, provincial and ministry level, starting with the school administrators, and necessary studies should be carried out to have a high quality of work life for teachers at schools. Otherwise, the teachers' quality of work will decrease, which will lead to a decrease in job satisfaction and an increase in turnover intentions, which is undesirable situation at schools because teachers will be beneficial for students and the school if they work in a comfortable quality work environment. No matter how qualified teachers are, when their perceptions of quality of work are not high, it will be difficult for them to focus on educational activities, and they will not have the desire to use their skills.

Recommendations

In line with the results of the research, the following suggestions are presented to researchers and practitioners:
1- To improve teachers' quality of work, teachers can be offered career opportunities, have self-control over their work, perform their work in a comfortable, peaceful environment without stress, and participate in decision-making processes. Their requirements for the tools, equipment and material can be met; school administrators can ensure the balance of work and family life of teachers, and care about these two living spaces of the teacher equally.
2- Teachers' job satisfaction, salary, and additional course fees could be increased, the teaching profession could become an ideal, attractive, and respected profession in society, and career opportunities could be raised to a high level by providing career opportunities to teachers.
3- Teachers' turnover intentions could be reduced by increasing their quality of work and job satisfaction.
4- A qualitative study could be carried out on the teachers' quality of work.

Conflicts of Interest

There is no conflict of interest for individuals or institutions in this research**.**

Limitations of the Research

This research is limited to the opinions of 368 teachers employed in the center of Bolu and their responses to the items on the Quality of Work, The Scale of Job Satisfaction and The Scale of Turnover Intention.

References

Aba, G. (2009*). The relationship between quality of work life and motivation: An ampirical study in the health sector* (Unpublished master thesis). Akdeniz University Institute of Social Sciences, Antalya.

Akar, H., & Üstüner, M. (2017). Turkish adaptation of work-related quality of life scale: Validity and reliability studies. *İnönü University Journal of the Faculty of Education*, *18(*2), 159-176. https://doi.org/10.17679/inuefd.302675.

Akehurst, G., Comeche, J., & Galindo, M. (2009). Job satisfaction and commitment in the entrepreneurial SME. *Small Business Economics*, *32*, 277-289.

Akşit Aşık, N. (2010). A conceptual evaluation of ındividual and organizational factors affecting employees' and results of job satisfaction. *Turkish Journal of Administration, 467,* 31-52.

Altınkurt, Y., & Yılmaz, K. (2014). Relationship between occupational professionalism of teachers and their job satisfaction. *Sakarya University Journal of Education, 4*(2), 57-71.

Arslan, S. (2018). *Examination of the relationship between teachers positive psychological capital perception and work family enrichment* (Unpublished master thesis). Kocaeli University Institute of Social Sciences, Kocaeli.

Aydın, Z. D. (2006). Healthy agýng for the individual and society: Role of lýfestyle factors. *Journal of Süleyman Demirel University Faculty of Medicine, 13*(4), 43-48.

Balcı, A. (2013). *Research, method, technique and principles in social sciences*. Pegem Academy.

Barker, J. D. (1986). *Influence of quality of work life variables on the retention and career satisfaction of science and mathematics teachers* (Dissertion thesis). The University of Tennessee.

Barutçugil, İ. (2004). *Strategic human resource management.* Kariyer Publishing.

Bartolome, F., & Evans Lee, P. A. (2001). *Should the price of success be this heavy, work and life balance*. MESS Publications.

Başaran, M., & Güçlü, N. (2018). Analyzing the relationship between school principles' management styles and teachers' job satisfaction. *Gazi University Journal of Gazi Education Faculty, 38*(3), 949-963.

Bhatnagar, T., & Soni, H. (2015). Impact of quality of work life on job satisfaction of school teachers in Udaipur City. *IOSR journal of Business and Management, 17*(3), 10-14.

Bhavani, M., & Jegadeeshwaran, M. (2014). Job satisfaction and quality of work life-a case study of women teachers in higher education. *SDMIMD Journal of Management, 5*(2), 1-12.

Bilgin, N. (1995). *Methods and practical studies in social psychology.* İstanbul: Sistem Publishing.

Bolduc, R. R. (2002). *An analysis of the relationship between quality of work life and motivation for correctional services officers in the montreal area* (Ph.D. thesis). McGill University, Canada.

Borman, G. D., & Dowling, N. M. (2008). Teacher attrition and retention: A meta-analytic and narrative review of the research. *Review of Educational Research, 78*(3), 367-409.

Büyükgöze, H., & Özdemir, M. (2017). Examining job satisfaction and teacher performance within affective events theory. *Inonu University Journal of the Faculty of Education, 18*(1), 311-325. https://doi.org/10.17679/inuefd.307041.

Cammann, C., Fichman, M., Jenkins, D., & Klesh, J. (1979). *Michigan organizational assessment questionnaire*. University of Michigan, Ann Arbor, Michigan.

Cerit, Y. (2015). Relatİonship between perceıves of classroom teachers' job complexity and intent to leave job. *Journal of Academic Perspective, 48*, 184-194.

Cook, A. L. (2008). *Job satisfaction and job performance: Is the relationship spurious?* (Doctoral dissertation). A & M University, Texas.

Currivan, D. B. (1999). The casual order of job satisfaction and organization commitment in models of employee turnover. *HRM Review, 9*(4), 495-525.

Çakır, Ö. (2001). *The phenomenon of work commitment and the factors affecting it*. Seçkin Publishing.

Çelik, Y., & Kılıç, İ. (2019). *The relationshıps between job satisfaction, professional burnout and quality of life in nurses. Kocatepe Medical Journal, 20*(4), 230-238.

Çoruk, A., & Karakaya Çiçek, H. (2017). The relationship between quality of school life and job satisfaction perceptions of teachers in elementary schools. *Dicle University Journal of Ziya Gökalp Faculty of Education, 2*(1),1-11.

Demir, E (2019). *The analysis of the relationship between teachers' work-related quality of life and their positive psychological capital levels* (Master thesis). İnönü University Institute of Educational Sciences, Malatya.

Demir, M.(2011). Relationships between employees' perceptions of quality of work life, intent to remain with the organization and employee absenteeism. *Ege Academic Review, 2*(3), 453-464.

Demir, T. (2016). *Relationship between quality of work life perception and organizational commitment in vocational school teachers* (Unpublished master thesis). Sabahattin Zaim University Institute of Social Sciences, İstanbul.

Demirtaş, Z. (2010). Teachers' job satisfaction levels. *Procedia Social and Behavioral Sciences, 9,* 1069-1073.

Demirtaş, Z., & Alanoğlu, M. (2015). The relationship between participation in decisionmaking of teachers and job satisfaction. *Journal of Ahi Evran University Kırşehir Education Faculty, 16*(2), 83-100.

Demirtaş, Z., & Nacar, D. (2018). The relationship between teachers' job satisfaction and organizational silence perceptions. *Journal of Educational Reflections, 2*(1), 13-23.

Deveci, Ş. (2021). *The relationship between the working life quality and job safisfaction levels of high school teachers* (Unpublished master thesis). Firat University Institute of Educational Sciences, Elazığ.

Dilaver, H. (1996). *Past, present and future of teacher employment in Turkey, perspectives on our education.* Kültür College Foundation Publications.

Ercan, V. (2016). *Investigation of the effect of organizational justice perception on bank employees' intention to quit* (Master thesis). Maltepe University Institute of Social Sciences, İstanbul.

Erdem, M. (2008). *According to teachers, the relationship between the quality of work life and organizational commitment in public and private high schools* (Unpublished doctoral dissertion). Ankara University Institute of Educational Sciences, Ankara.

Erginer, A. (2003). The nature of work life. C. Elma and K. Demir (Ed.), *Contemporary approaches in management in.* Memoir Publishing.

Ertürk, R. (2020). Teacher autonomy: A conceptual analysis. *International Pegem education congress (Ipcedu-2020) full text book in* (s. 452-464). Pegem Publishing.

Fatimah, O., Noraishah, D., Nasir, R., & Khairiddin, R. (2012). Employment security as moderator on the effect of job security on worker's job satisfaction and well-being. *Asian Social Science, 8*(9), 50-56.

Field, A. (2009). *Discovering statistics using SPSS* (Third Edition). London: Sage Publications Ltd.

Fong, Y. L., & Mahfar, M. (2013). Relationship between occupational stress and turnover ıntention among employees in a furniture manufacturing company in selangor. *Jurnal Teknologi, 64*(1), 33-39.

Gaertner, S. (1999). Structural determinants of job satisfaction and organizational commitment ın turnover models. *Human Resource Management Review, 9*(4), 479-493.

Gamsız, Ş., Yazıcı, H., & Altun, F. (2013). Type a personality, stress resources, selfefficacy and job satisfaction among teachers. *Turkish Studies, 8*(8), 1475-1488.

Genç, N. (2005). *Management and organization* (2nd Edition). Seçkin Publishing.

Gül, H., Oktay, E., & Gökçe, H. (2008). Relationships between job satisfaction, stress, organizational commitment, turnover intention and performance: An application in the health sector. *Academic Perspective International Refereed E-Journal of Social Sciences, 15*, 1-11.

Gün, G. (2016). Labour turnover rate in hotel businesses: A study in Bitlis. Bitlis Eren University Journal of Social Sciences Institute, *5*(2), 1-20.

Gürsel, M., Izgar, H., & Altınok, V. (2003). *Industrial and organizational psychology, job satisfaction.* Star Offset Printing.

Hayes, L. J., Pallas, L. O., & Duffield, C. (2006). Nurse turnover: A literature review. *International Journal of Nursing Study, 43*(2), 237-263.

Ho, C. L., & Au, W. T. (2006). Teaching satisfaction scale: Measuring job satisfaction of teachers. *Educational and Psychological Measurement, 66*, 172-185.

Hong, K., Tan, K., & Bujang, S. (2010). *Relationships between work life quality of teachers with work commitment, stress and satisfaction: A study In Kuching, Sarawak, Malaysia. Jurnal Teknologi, 52*, 1-15, http://doi.org/10.11113/jt.v52.133.

Hsiao, A., Auld, C., & Ma, E. (2015). Perceived organizational diversity and employee behavior. *International Journal of Hospitality Management, 48*, 102-112. http://dx.doi.org/10.1016/j.ijhm.2015.04.009.

Ingersoll, R. (2001). Teacher turnover and teacher shortages: An organizational analysis. *American Education Research Journal, 38*, 499-534.

Ingersoll, R. M., & Smith, T. M. (2003). The wrong solution to the teacher shortage. *Educational Leadership, 60*(8), 30-33.

Işıkhan, V. (2004). *Stress in working life and ways of coping*. Ankara: Sandal Publications.

İsmetoğlu, M. (2017). *Branch teachers' multicultural efficiency levels and their perceptions towards quality of work life* (Unpublished master thesis). Abant İzzet Baysal University Institute of Educational Sciences, Bolu.

Kalaycı, Ş. (2009). *SPSS applied multivariate statistics applications*. Asil Publishing.

Karasar, N. (2011). *Scientific research methods*. Ankara: Nobel Publications.

Kheirandish, S.M. (2009). *Relation between working life quality and performance of employees in Irankhodro Dizeli company* (Master thesis). Alame Tabatabaii University, Tahran, Iran.

Köklü, M. (2012). Participations in decision making, desires for participation, job satisfactions and conflict management styles of secondary education teachers. *Education and Science, 37*(165), 208-223.

Kösterelioğlu, A. M. (2011). *Relationship between quality of work life and work alienation in primary school teachers* (Unpublished doctoral dissertion). Abant İzzet Baysal University Social Sciences Institute, Bolu.

Lambert, E. G., Hogan, N. L., & Barton, S. M. (2001). The impact of job satisfaction on turnover intent, a test of a structural measurement modelling a national sample of workers. *Social Science Journal, 38*(2), 233-251.

Lee, D. J., Singhapakdi, A. & Sirgy, M. J. (2007). Further validation of a need-based quality-of-work-life (QWL) measure: Evidence from marketing practitioners. *Applied Research in Quality of Life, 2(4),* 273-287.

Liu, S. (2012). The Influences of school climate and teacher compensation on teachers' turnover intention in China. *Educational Psychology, 32*(5), 553-569.

Liu, S., & Onwuegbuzie, A. J. (2012). Chinese teachers' work stress and their turnover intention. *International Journal of Educational Research, 53*, 160-170.

Loeb, S., & Darling-Hammond, L. (2005). How teaching conditions predict teacher turnover in California schools. *Peabody Journal of Education, 80*(3), 44-70.

Luthans, F. (2011). *Organizational behavior: An evidence-based approach*. McGraw-Hill/Irwin.

Makela, K. (2014). *PE Teachers' job satisfaction, turnover, and intention to stay or leave the profession* (Unpublished doctoral dissertion). University of Jyväskylä, Jyväskylä, Finland.

Manju, N. (2014). Quality of work life: Perception of school teachers. *International Journal of Education and Psychological Research, 3*(2), 77-80.

Martel J. P., & Dupuis, G. (2006) Quality of work life: Theoretical and methodological problems and presentation of a new model and measuring instrument. *Social Indicators Research, 77*, 333-368.

Meng, F. & Wu, J. (2015). Merit pay fairness, leader-member exchange, and job engagement evidence from mainland China. *Review of Public Personnel Administration, 35(1)*, 47-69.

Meziroğlu, M. (2005). *Measuring the job satisfaction levels of classroom and branch teachers (Zonguldak Province Example)* (Unpublished master thesis). Zonguldak Karaelmas University Institute of Social Sciences, Zonguldak.

Michaelowa, K. (2002). Teacher Job Satisfaction, Student Achievement, and the Cost of Primary Education in Francophone Sub-Saharan Africa. HWWA Discussion Paper, 188. Hamburg, Germany.

Patrick, A. S. (2007). *Examination of teacher workplace satisfaction and student achievement* (Doctoral dissertion). Georgia Southern University, Statesboro, Georgia.

Pedler, M., Burgoyne, J., & Boydell, T. (2001). *The learning company: Astrategy for sustainable development.* London: McGraw-Hill.

Pfeffer, J. (2004). *Competitive advantage through people: Unleashing the power of the workforce.* Boston, MA: HBS Press.

Rainayee, R. (2012). Organization, job, perks and employee turnover intentions. *Journal of Research in Management & Technology, 1*, 17-21.

Rethinam, G. S., & Ismail, M. (2008). Constructs of quality of work life: A perspective of information and technology professionals. *European Journal of Social Sciences, 7*(1), 58-70.

Robbins, S. P., & Judge, T. (2012). *Organizational behavior* (Trans. Ed.: İ. Erdem). Nobel Academic Publishing.

Sandrick, K. (2003). Putting the emphasis on employees as an award. Winning employer, baptist health care has distant memories of the workforce shortage. *Trustee*. 6-10.

Sarıkaya Ş. (2019). *The perception of organizational trust and organizational support as teachers' job satisfaction predictor* (Unpublished master thesis). İstanbul Sabahattin Zaim University Institute of Social Sciences, İstanbul.

Sarı Kardaş, Y. (2020). *The relationship between the perceptions of primary school teachers on the work life quality and the level of job satisfaction (Sample of central district of Balıkesir)* (Unpublished master thesis). Anadolu University Institute of Educational Sciences, Eskişehir.

Sarpkaya, R. (2000). Job satisfaction of teachers working in high schools (Example of Manisa province). *Journal of Public Administration, 33*(3), 121-123.

Schyns, B., Torka, N., & Gössling, T. (2007). Turnover intention and preparedness for change: Exploring leader-member exchange and occupational self-efficacy as antecedents of two employability predictors. *Career Development International, 12*(7), 660-679.

Seyhan, F. (2020). *The relationship among organizational conflict, organizational stress, quality of work-life, job satisfaction and turnover intention experienced by health workers* (Unpublished master thesis). Ankara Hacıbayram University Graduate Education Institute, Ankara.

Shapira-Lishchinsky, D. (2012). Teachers' withdrawal behaviors: Integrating theory and finding. *Journal of Educational Administration, 50*(3), 307-326.

Shaw, J. D. (1999). Job satisfaction and turnover intentions, the moderating role of positive Affect. *Journal of Social Psychology, 39*(2), 242-245.

Singh, O. P., & Singh, S. K. (2015). Quality of work life of teachers working in higher educational ınstitutions: A strategic approach towards teacher's excellence. *International Journal, 3*(9), 180-186.

Stevens, J. P. (2009). *Applied multivariate statistics for the social sciences* (Fifth Edition). New York: Routledge.ü

Swathi, V., & Reddy, M. (2016). Implications of stress on quality of work life among teachers: an ampiricalstudy. *IPE Journal of Management, 6*(1), 46.

Şangar, Z. (2016). *Job satisfaction and quality of life: Academic study on academic staff* (Unpublished master thesis). Eskişehir Osmangazi University Institute of Educational Sciences, Eskişehir.

Şevik, Ü. (2019). *The effect of perceived organizational politics and positive psychological capital on job satisfaction, intention to leave and organizational silence: The sample of Afyonkarahisar province* (Unpublished doctoral dissertion). Sakarya University Business Administration Institute, Sakarya.

Tabachnick, B. G., & Fidell, L. S. (2013). *Using multivariate statistics* (6th ed.). Allyn and Bacon.

Tek, B. (2014). *An investigation of the relationship between school leadership, teacher job satisfaction, and student achievement* (Unpublished doctoral dissertion). University of Rhode Island, Rhode Island, USA.

Töremen, F., & Demir, S. (2016). The effects of psychological capital on teachers' intentions to leave. *Mustafa Kemal University Journal of Graduate School of Social Sciences, 13(*34), 166-179.

Trevor, C. O. (2001). Interactions among actual ease-of-movement determinants and job satisfaction in the prediction of voluntary turnover. *Academy of Management Journal, 44*(4),621-639.

Tuncer, M. (2012). *The effect of the quality of working life on emloyees intentions regarding leaving their job: An application on hotel enterprises* (Unpublished doctoral dissertation). Gazi University Institute of Educational Sciences, Ankara.

Van Laar, D., Edwards, J. A., & Easton ,S.(2007). The work related quality of life scale for healthcare workers. *Journal of Clinical Nursing. 3*(60), 325-33.

Waitayangkook, C. (2003). *Quality of work life: Interactional perspective with thai aspect.* University of North Texas: consultant, scri, manplaw office, Bangkook, Thailand.

Waterman, A. S. (1993). Two conceptions of happiness: Contrasts of personal expressiveness (eudaimonia) and hedonic enjoyment. *Journal of Personality and Social Psychology, 64,* 678-691.

Yalçın, S. (2014). *The investigation of relationship between the leadership style of administrators and teachers' worklife quality and their organizational commitment level* (Unpublished doctoral dissertion). Ataturk University Institute of Educational Sciences, Erzurum.

Yapıcı, N. (2008). *Mobbing, its perceived reasons and its effect on job satisfaction and the intention to leave from work: A research in agriculture sector in Antalya* (Unpublished master thesis). Akdeniz University Institute of Social Sciences, Antalya.

Yıldırım, F. (2007). The relationship between organizational lustice and job satisfaction. *Ankara University Journal of SBF, 62*(1), 253-278.

Yılmaz, A., & Ceylan, Ç. B. (2011). Relationship between primary school administrators' leadership behavior and job satisfaction of teachers. *Educational Administration: Theory and Practice, 17*(2), 277-394.

Yılmaz, K., & Altınkurt, Y. (2012). Relationship between school administrators' power sources and teachers' job satisfaction. *Kastamonu Journal of Education, 20*(2), 385-402.

Yücel, İ., & Koçak, D. (2018). Mediating effect of burnout on the relationship between job satisfaction and intentions to leave: A study in the health sector. *MANAS Journal of Social Studies, 7*(2), 297-321.

Yüksel, H., & Yüksel, M. (2014). The correlatİon between job satisfactıon and job turnover: A case study on the secondary school teachers. *The Journal of International Social Research, 7*(32), 559-572.

International Journal of Contemporary Educational Research (IJCER)

www.ijcer.net

Why Do Teachers Fear? Investigating Teachers' Perceptions of the Culture of Fear through Mixed Methods Research

Bünyamin Ağalday[1], Mehmet Yiğit[2]
[1] Mardin Artuklu University, 0000-0003-0128-5055
[2] Ministry of National Education, 0000-0003-3776-4437

Article History
Received: 18.11.2021
Received in revised form: 08.02.2022
Accepted: 09.03.2022
Article Type: Research Article

To cite this article:

Ağalday, B., & Yiğit, M. (2022). Why do teachers fear? Investigating teachers' perceptions of the culture of fear through mixed methods research. *International Journal of Contemporary Educational Research*, *9*(1), 204-218. https://doi.org/10.33200/ijcer.1025710

International Journal of Contemporary Educational Research
Volume 9, Number 1, March 2022, 204-218 ISSN: 2148-3868

Why Do Teachers Fear? Investigating Teachers' Perceptions of the Culture of Fear through Mixed Methods Research

Bünyamin Ağalday[1*], Mehmet Yiğit[2]
[1] Mardin Artuklu University,
[2] Ministry of National Education

Abstract

This research aims to reveal the source of fears by examining various variables of teachers' perceptions of fear culture. The study employed an explanatory approach of mixed methods research. Quantitative data were obtained through the "Culture of Fear in Schools Scale," while qualitative data were gathered through a semi-structured interview form. Quantitative data were collected from 325 teachers working in primary and secondary schools in Turkey, selected via the simple random sampling method. Qualitative data were collected from 15 teachers selected using the maximum variation sampling method. Many contradictions have emerged between the quantitative and qualitative findings in the study. While quantitative findings show that teachers experience low levels of fear originating from administrators, colleagues, and legal processes, qualitative results show that teachers experience these fears more prominently. In addition, based on the variables of gender, marital status, seniority at the current school, employment status, and professional seniority, a statistically significant difference was found between teachers' perceptions of the culture of fear. In conclusion, the research provides some evidence for a culture of fear in schools. In addition, some critical implications regarding the origin of teachers' perceived fears were discussed for future research, practitioners, and policymakers.

Keywords: Fear, Culture of fear, Teachers, Schools, Mixed-methods

Introduction

Apart from social needs, people also have physiological conditions in social life. The emotional state of people who are in constant interaction with other individuals in the society to meet their social needs may be a critical factor (Cüceloğlu, 2001). As in many living things, the primary emotion considered "the strongest basis of emotional states" in humans is fear (Roseman et al., 1994). Fear, a powerful and disturbing feature, is an innate and learned emotion (Witte, 1998). In relationships with fear, people approach each other with an intense risk sensitivity, and developing intimate relationships becomes difficult. According to Furedi (2014), this situation creates an environment where mutual trust in human relations is lost. People are alienated from each other, and all relationships are evaluated through the prism of risk.

Fear, which can become a part of the culture in educational organizations, i.e., schools, can cause undesirable consequences (Şişman et al., 2010). Because a culture of fear can increase anxiety by posing a potential threat to the trust relationship between school stakeholders, increasing pressure can cause different psychological problems. Besides, it can also lead to uncertainty. Increasing uncertainty, in turn, may cause teachers to exhibit irrational behaviours (Hoy & Miskel, 2010). The acts of administrators frightening teachers and teachers frightening students to maintain school discipline cause a culture of fear (Kahraman, 2019). Teachers working in schools dominated by a culture of fear may experience fear of legal actions that would be taken against them due to their behaviour. Authoritarian managers may wish to retain control, using the threat of legal action. In schools where a culture of fear is dominant, teachers' accountability stems from the fear of punishment by the authority, not from their conscience. These penalties can be psychological, such as reprimand and criticism, or disciplinary actions such as condemnation and warning (Cüceloğlu, 2018). A control-oriented management approach can harm teachers' feelings of security by damaging the school atmosphere. The findings of Hoffman

* Corresponding Author*: Bünyamin Ağalday, bunyaminagalday@artuklu.edu.tr*

et al.'s research (1994) show that as school principals become authoritarian, teachers' perceptions of organizational security decrease. There cannot be a democratic educational environment in schools where administrators use their power and status as an element of fear against teachers.

The studies on the culture of fear mainly focus on *sociology* (Furedi, 2007), *organizational management* (Ashkanasy & Nicholson 2003), and *media* (Chaiuk & Dunaievska, 2020). However, research carried out in schools has remained limited. For example, Yılmaz and Göçen (2015) have found that disciplinary penalties cause fear among students in primary schools. Thompkins (2000), on the other hand, has found in his research that it is possible to reduce fear in schools by increasing security measures. On the other hand, only one such study has been found that directly deals with the culture of fear. However, in that study by Kahraman (2019), the effect of school administrators' management style and organizational change on the culture of fear teachers perceive has been examined with a quantitative approach. In reality, the culture of fear has a complex structure regarding its perception and effects. Therefore, it is thought that quantitative data alone are not sufficient to examine the functioning of the culture of fear in schools in detail. Quantitative data should be analyzed more profoundly by using qualitative methods. Because determining the reasons for teachers' fears can guide education administrators in eliminating or managing fear. The culture of the environment in which teachers work, who have significant contributions in achieving the goals and objectives of schools, affects their motivation, productivity, commitment to their profession, and therefore their emotional state. This situation seriously affects the quality of education and teaching effectiveness (Dilekçi & Nartgün, 2019). It is argued that making schools effective depends on understanding their culture (Hoy & Miskel, 2010). A culture of fear can create anxiety in teachers. To deal with stress, it is important to understand organizational culture (Schein, 1985). Therefore, examining teachers' perceptions of the culture of anxiety may also help to reduce teacher anxiety. For this reason, this research can contribute to the field of education by examining the culture of fear in schools in a holistic and in-depth sense. From this point of view, the study is thought to fill a gap in the literature and shed light on future studies. In this context, this research aims to reveal the source of fears by examining teachers' perceptions of fear culture in terms of various variables. Therefore, the first and third research questions were formed with the positivist paradigm and the second and fourth questions with the constructivist one:

(R1) What are teachers' perceptions of fears stemming from managers, colleagues, and the legal process?
(R2) What are the reasons for teachers' fears of administrators, colleagues, and the legal process?
(R3) Is there a significant difference between teachers' perceptions of the culture of fear based on gender, marital status, seniority at current school, employment status, and professional seniority?
(R4) If there is a significant difference between teachers' perceptions of the culture of fear, what are the reasons based on different variables?

Culture of Fear

Fear is a highly negative emotional arousal caused by perceiving a personal threat (Witte, 1998). With the beginning of attempts to analyze fear, which is a part of daily social relations, at a macroscopic level, the existence of a "culture of fear" has begun to be advocated in contemporary societies (Tudor, 2003). Although their socio-cultural environment has significantly shaped all fears, fears experienced and expressed over a long period will be more susceptible to socially molded processes of reinforcement and routinization. Although all fears are shaped significantly by their socio-cultural environment, fears experienced and expressed over a long time will be more susceptible to socially molded reinforcement and routinization processes, leading to a culture of fear (Cüceloğlu, 2001).

The culture of fear in schools can be defined as the culture formed due to fears arising from teachers' experiences and relationships in schools (Çelik & Kahraman, 2019). The culture of fear in organizations can generally be caused by organizational change, risk-taking, making mistakes, success, uncertainty, and contradicting group decisions (Appelbaum et al., 1998). However, many factors can cause the emergence and spread of a culture of fear in schools. On top of these factors are the fear-based management approach of school principals, the environment of uncertainty and insecurity brought about by fear, teachers' negative attitudes and behaviours towards their colleagues, and the fears arising from legal processes related to the teaching profession. In this context, the culture of fear in schools has been examined in three main dimensions (Çelik & Kahraman, 2019), namely "fear of the manager," "fear of colleagues," and "fear of the legal process." The first dimension of the study, the fear of managers, is the administrators' fear, whom teachers see as powerful and authority in school. The second dimension, the fear of colleagues, is the fear of other teachers in the same school. The third dimension, the fear of the legal process, is the fear arising from legal processes such as disciplinary investigation or punishment for teachers' behaviours at school.

Method

Research Design

In the study, an explanatory approach of the mixed-methods research was employed. The dominant quantitative research in this model is supported by qualitative data (Creswell et al., 2003). The justification for using the mixed method is that the quantitative findings on the fear culture, which has a complex structure, will reveal the overall picture of the problem. At the same time, the qualitative data will provide a deeper understanding of the causes of the quantitative findings. While the survey design was used in the quantitative section of the study, the phenomenology design was employed in the qualitative section. Phenomenology investigates how individuals perceive and transfer their experiences individually or in groups (Patton, 2005). In this research, we used phenomenology in the qualitative part, as we focused on the fear experienced by teachers.

Participants

The study sample consisted of 302 teachers selected by the simple random sampling method at 38 primary and secondary schools in Mardin, located in the southeast of Turkey. Of the teachers, 40.9% were female and 59.1% were male; 49.8% were married and 50.2% were single; 12.9% had less than one year of seniority, 32.9% had 1-5 years, 36% had 6-10 years, 10.5% had 11-15 years, and 7.7% had 16 years or more. In the qualitative part of the research, the study group consisted of 15 teachers representing different features with the maximum variation sampling method. The demographics of those in the study group are given in Table 1.

Table 1. Study group

Code	*Gender*	*Marital status*	*Professional seniority*	*Seniority at the current school*	*Employment status*
T1	Female	Single	3 years	3 years	Contracted
T2	Male	Single	<1 year	<1 year	Contracted
T3	Male	Single	7 years	3 years	Tenured
T4	Female	Single	<1 year	<1 year	Contracted
T5	Female	Married	12 years	3 years	Tenured
T6	Male	Married	12 years	5 years	Tenured
T7	Female	Single	3 years	3 years	Contracted
T8	Male	Married	5 years	5 years	Tenured
T9	Female	Single	6 years	2 years	Tenured
T10	Female	Married	8 years	5 years	Tenured
T11	Female	Single	<1 year	<1 year	Paid
T12	Male	Married	<1 year	<1 year	Paid
T13	Male	Married	16 years	5 years	Tenured
T14	Male	Married	12 years	2 years	Tenured
T15	Male	Married	23 years	6 years	Tenured

Of the participants, seven are women, eight are men, seven are single, and eight are married. The seniority of teachers in the current school is up to six years. While the seniority of four teachers is less than one year, the seniority of the others varies between three and twenty-three years. While two of the teachers are paid, four are contracted, and nine are tenured staff.

Data Collection Tools

In the research, the "Culture of Fear in Schools Scale (CFS)" developed by Çelik and Kahraman (2019) was used. Explanatory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) were performed within the scope of validity. As a result of EFA, the scale consisted of 3 factors (fear of manager, fear of colleagues, fear of legal process) and 18 items in total. The total variance of the scale explained is 64.66%. In the quantitative part of this study, the fit indices obtained in CFA (χ^2/df = 2.52, GFI = .90, CFI = .95, RMSEA = .06) were acceptable (Schermelleh-Engel et al., 2003). Cronbach's Alpha coefficients ranged between 0.80 and 0.92. For this study (see Table 2), Cronbach's Alpha coefficients (ranged between 0.84 and 0.94) were high level (Taber, 2018). The scale is rated 5-point Likert as "1: Never"-"5: Always". A semi-structured interview form was employed as a qualitative instrument. This form was prepared in line with the participant's experiences and the data obtained from the scale and expert views (Cresswell, 2013).

Data Collection and Analytical Approach

The research was deemed ethically appropriate by the university. We collected the data in the 2020-2021 academic year. First of all, we informed the school principals and teachers about the research. We collected data online through emails or social media applications. Participation was based on voluntary. The interviews were conducted face to face and lasted between 30-45 minutes. The audio interview was recorded with the teachers' permission, and the data were transcribed.

Quantitative data of the study were analysed using SPSS software. The skewness coefficients of the CFS ranged between .12-1.96 and the kurtosis coefficients between -1.07-1.93. Descriptive statistics primarily interpreted the data. A t-test was used to test the difference between group means because the data were distributed close to normal (Kline, 2011). However, the difference in variables with at least three subgroups was tested with Welch ANOVA as the variances were not equal. Games-Howell was applied to determine the source of the difference in Welch ANOVA. The study also examined the effect size (Green & Salkind, 2005). The construct validity of CFS was tested with AMOS software.

We collected the qualitative data by audio recordings that have been written and edited. Qualitative data were analyzed using the descriptive analysis method, and direct quotations were used to add a remarkable feature to the participants' opinions. Teachers' views were given under the code names. After analysing the data in the qualitative part of the study, we employed member checking. To increase external validity, we explained the research process and what has been done in detail. To increase reliability, we gave all results directly without any comments. During the data editing, we examined each interview form and compared them. We read the document and revised it (Patton, 2005).

Results

First, the quantitative results are presented in tables and interpreted, and then the qualitative ones are included.

Results regarding the First Two Research Questions of the Study

The mean and standard deviation values regarding CFS dimensions are presented in Table 2.

Table 2. Descriptive statistics

Dimension	*Mean*	*SD*	*a*
Fear of manager	1.90	.93	.94
Fear of colleagues	1.73	.89	.84
Fear of the legal process	1.74	.89	.87

In Table 2, teachers experienced *fear of manager* (*M* = 1.90, *SD* = .93) at a lower level. Based on the quantitative findings, the teachers were asked this question, "Are you afraid of your principal in your school? Why?". The opinion emphasized by T1, who stated that she had experienced fear arising from the school principal's personality traits, is as follows:

> "I have feared since my school principal is a little panicked. It creates a perception that we will get big penalties if we don't do some tasks. I am afraid that he will impose a sanction on me if I make a mistake in any situation (T1)."

The opinion of T4, who stated that she would experience fear in case of any problems while carrying out her duties and responsibilities, is as follows:

> "If I experience any disruption in the work that we need to do and if I cause this disruption, I feel uneasy. I'm a person who always aims to fulfill his responsibilities and do his work on time, and when I can't do it on time, I have both a fear of myself and a fear of our principal (T4)."

Pointing out that she experiences fear when she thinks differently with the school principal, T10 expresses her views as follows:

> "…I think that if I contradict the school administration or make an opinion against them, I will most probably face a bad situation. I can easily say this because I have seen it from my friends who thought differently and had problems (T10)."

The opinion of T3, who said that he felt that the school principal was constantly watching him, and therefore experienced insecurity and fear, is as follows:

> " Sometimes I am afraid of my principal. Especially when I am on duty during breaks, I immediately feel obliged to say that I am on duty when the principal passes by. Because at that moment, the principal passes by the door or indicates that I am late for class (T3)."

Contrary to the quantitative findings, in the qualitative findings, it was seen that the teachers perceived the fears from the administrator prominently. In Table 2, teachers' perceptions of fear of colleagues are very low (M = 1.73, SD = .89). Based on the quantitative finding, the teachers were asked this question; "Do you see your colleagues as a threat? Why?" Stating that he did not experience fear from his colleagues, T15 associated this situation with cooperation with his colleagues, sincere relationships based on trust, and shared values in the following words:

> "I do not see my colleagues as a threat. This school is like our second home. We should support and help each other throughout the time we work together. Here, too, we have such a working environment. Here, everyone works completely focused on education and the success of students (T15)."

T3 emphasized that the negative attitudes and behaviours of his colleagues caused him to experience fear as follows:

> "Unwelcome situations such as gossiping among teachers, complaining about each other, constantly comparing ourselves to each other, making negative comments about ourselves when we make mistakes, or reporting these mistakes to school administrators, harm us morally and make us feel threatened (T3)."

T5, who emphasized that a school environment where cooperation between colleagues is not strong and experiences are not shared pose a threat; her opinion is as follows:

> "I have fear from time to time due to my colleagues. This situation relates to my colleagues' approach to me and right or wrong to their profession. For example, if colleagues are jealous of each other, if they look at each other as an enemy, if they say, "I'm doing it, you do less, so that all successes become mine," in short, if they act selfishly, I think this is a threat (T5)."

T2 expressed his dissatisfaction with the fact that his colleagues would know that he had different political views, especially at school:

> "…Today, you can be tagged because of your political views in your environment. However, this may cause my colleagues to have prejudices about me. In other words, I am worried that my political views will not be respected, and I am afraid that when I make a mistake, my friends who disagree with me will judge me and will use this situation against me (T2)."

In Table 2, teachers' perceptions of fear of legal process are very low (M = 1.74, SD = .89) Based on this, the teachers were asked this question, "Are you afraid of being punished or being subject to disciplinary investigation as a result of your behaviour at your school? Why?" Stressing that the fear of losing one's job and financial worries, as a result, is a severe factor in his fear, T3's opinion is as follows:

> "I am afraid of being punished legally or being fired from my profession because I will have financial difficulties. Because my job is my livelihood. I don't have any other income, and if I lose this job, I will be in trouble. At the same time, I support my family, and if I have problems with my job, my family will be negatively affected. So I am always afraid of being punished (T3)."

T14, who pointed out that making a mistake may result in punishment, and therefore he may experience fear, his opinion is as follows:

> "Every teacher has fears from legal processes. Because doing things incompletely or wrong may lead to some penalties and sanctions (T14)."

Results regarding the Third and Fourth Questions of the Study

The *t*-test values of teachers' perceptions of the culture of fear in schools based on gender are presented in Table 3.

Table 3. Findings on gender

Dimension	*Gender*	*N*	*Mean*	*SD*	*df*	*t*	*p*
Fear of manager	1. Female	133	1.76	.79	323	-2.47	.01*
	2. Male	192	2.00	1.00			
Fear of colleagues	1. Female	133	1.58	.74	323	-2.75	.00*
	2. Male	192	1.84	.97			
Fear of legal process	1. Female	133	1.63	.63	323	-2.76	,04*
	2. Male	192	1.82	.91			

* $p < .05$

A significant difference was found in the dimensions of *fear of manager* [t(323) = -2.47, p = .01], *fear of colleagues*, [t(323) = -2.75, p = .00] and *fear of legal process* [t(323) = -2.76, p = .04] concerning *gender*. Calculated effect sizes ($d_{manager}$ = -.27, $d_{colleague}$ = -.31, d_{legal} = -.31) indicate that the differences are moderate. Perceptions of men (M = 2.00, SD = 1.00) are higher than women's perceptions (M = 1.76, SD = .79). Based on the quantitative findings, the teachers were asked "Do you think female teachers or male teachers experience more fear at school? Why?" The opinion of T4, who stated that female teachers experience more fear, is as follows:

> "I think male teachers are more comfortable because they have a closer relationship with the school principal. However, female teachers approach the school principal more distantly and more nervously. Perhaps women would feel more comfortable if the school principal was a woman (T4)."

T6, who stated that the fact that women were raised in a culture of fear in social life caused them to experience more fear in their business life as well, his opinion is as follows:

> "Female teachers fear more. Because they behave more naively and passively owing to their being emotional by nature, that's why I think the pressure on women is more. The reason for this is a situation related to the upbringing of women in society (T6)."

Reinforcing these statements, T7 also stated that female teachers experience more fear due to the patriarchal social structure in the following words:

> "I think women fear more. Because, as in every part of the society, the school principal sometimes thinks that he can make women accept certain things more easily due to the gender inequality in the society. In this sense, I think that women are more afraid (T7)."

Pointing out that male and female teachers have different attitudes towards the problems they encounter at school and towards their solution strategies, T11's opinion is as follows:

> "I think women are more afraid. Because men defend themselves better, they are more assertive, whereas women, being more polite and sensitive, stay passive when they have problems. Unfortunately, this also causes them to face harsh reactions (T11)."

When the qualitative findings are examined, contrary to the quantitative results, female teachers perceive fear at a higher level. The *t-test* values of teachers' perceptions of the culture of fear in schools based on their marital status are presented in Table 4.

Table 4. Findings on marital status

Dimension	*Marital Status*	*N*	*Mean*	*SD*	*df*	*t*	*p*
Fear of manager	1. Married	162	2.02	1.01	323	2.25	.02*
	2. Single	163	1.79	.83			

Fear of colleagues	1. Married	162	1.68	.87	323	-1.11	.26
	2. Single	163	1.79	.91			
Fear of the legal process	1. Married	162	1.71	.89	323	-.68	.49
	2. Single	163	1.78	.88			

* $p < .05$

A significant difference was found in the dimension of *fear of manager* [t(323) = 2.25, p = .02] concerning *marital status*. The difference is moderate according to the effect size (d = .24). Perceptions of married teachers are higher (M = 2.02, SD = 1.01) than those of single teachers (M = 1.79, SD = .83). Based on the quantitative findings, the teachers were asked: "Do you think married teachers experience more fear at school than single teachers? Why?" Regarding the question, T9 emphasized the negligent behaviour of married teachers due to their spouses, children, and other house responsibilities. Her opinion is as follows:

> "If we consider that married people have more duties and responsibilities, I think they will be more worried because of the possibility of neglecting the rules. If a teacher has a family and children, their responsibilities increase, so their professional duties can also be a bit difficult for them (T9)."

T15, who emphasized that with the increase in financial concerns for married teachers, the fear of losing one's profession also increases, his opinion is as follows:

> "I think married teachers experience more fear. Because they have more responsibilities in their private lives, their profession is vital for their spouses and children, and themselves (T15)."

T13, who draws attention to the negative approach of the school administration to single teachers, mainly during the candidate teaching process, expressed his views as follows:

> "Single teachers are younger and inexperienced due to their age. Therefore, most single and especially candidate teachers are terrified. Because at the end of the candidacy process, the school principal gives them a performance grade, which is an essential criterion for successfully passing the candidacy process (T13)."

The opinion of T6, who draws attention to the support that married teachers receive from their spouses, is as follows:

> "Single teachers experience more fear. Because in married teachers there is someone in their lives who gives them confidence. A second person supports them in every way (T6)."

T12, who emphasizes that single teachers, since they are mainly new to the profession, can be uneasy while solving the problems they encounter, his opinion is as follows:

> "I think single teachers are more afraid. Because usually, single teachers are young and just starting. Since they are inexperienced and in the first years of their profession, making mistakes is higher in every sense. But since married teachers have attained a certain age, I think they are more comfortable in this regard (T12)."

Besides coherent qualitative and quantitative findings in the marital status variable, there are also conflicting ones. The Welch ANOVA test values according to *seniority at the current school* are presented in Table 5.

Table 5. Findings on seniority at the current school

Dim	Seniority at the current school	*N*	*Mean*	*SD*	Homogeneity		*df1*	*df2*	*F*	*p*	Dif.
					Levene	*p*					
Fear of manager	< 1 year	94	1.80	.90	5.83	.00	3	116.58	3.19	.02*	1-3 2-3
	1-3 years	114	1.79	.77							
	4-6 years	85	2.20	1.10							
	> = 7 years	32	1.81	.90							
Fear of colleagues	< 1 year	94	1.83	.97	1.20	.01	3	118.36	.66	.57	-
	1-3 years	114	1.69	.81							
	4-6 years	85	1.73	.90							
	> = 7 years	32	1.60	.88							

Fear of legal process	< 1 year	94	1.88	.96	4.81	.00	3	130.79	4.09	.00*	1-4 3-4
	1-3 years	114	1.68	.80							
	4-6 years	85	1.80	.97							
	> = 7 years	32	1.40	.59							

*: $p < .05$

A significant difference was found in the dimensions of *fear of manager* (Welch F(3, 116.58) = 3.19), and *fear of legal process* (Welch F(3, 118.36) = .66) concerning *seniority at the current school*. Effect sizes ($d_{manager}$ = -.03, d_{legal} = -.02) indicate that the differences are moderate. Based on the quantitative findings, the teachers were asked, "As your seniority at your school increases, does your level of fear change? Why?" Regarding the question, T2 states that the level of fear would decrease with the increase in the experience. His opinion is as follows:

> "We gain experience as our seniority increases, which makes us more comfortable. Because I see that experienced teachers in our school are more comfortable and less afraid than newcomers (T2)."

The opinion of T3, who emphasizes that anxiety decreases with seniority in the current school, drawing to the adoption of common goals and values in the school and the development of relationships, is as follows:

> "As my seniority at my school increases, my level of fear decreases as I get used to the school culture better. Because I am getting more and more familiar with the rules and functioning of the school, knowing the students, parents, teachers I work with, and the school administration better. The increase in my professional experience reduces my fears. As time goes on, I develop more sincere relations with my colleagues, and because I learn about my legal rights and responsibilities better, my fears are lessened (T3)."

The opinion of T15, who stated that as the length of service increases at school, teachers' sense of "belonging to their institution" also increases, and they identify themselves with their school, is as follows:

> "As your seniority at the school increases, you like the school more, and you get used to that institution more. Your commitment to school increases, your positive attitude towards your job increases. You feel more comfortable at work and school (T15)."

The Welch ANOVA test values according to employment status are presented in Table 6.

Table 6. Findings on employment status

Dim	Employment status	*N*	*Mean*	*SD*	Homogeneity		*df1*	*df2*	*F*	*p*	Dif.
					Levene	*p*					
Fear of manager	Tenured	210	2.01	1.00	7.68	.00	2	47.33	4.48	.01*	1-2
	Contracted	97	1.71	.74							
	Paid	18	1.70	.84							
Fear of colleagues	Tenured	210	1.74	.91	4.49	.01	2	61.75	5.75	.00*	1-3 2-3
	Contracted	97	1.77	.91							
	Paid	18	1.37	.42							
Fear of legal process	Tenured	210	1.76	.94	1.56	.01	2	50.32	.80	.45	-
	Contracted	97	1.73	.81							
	Paid	18	1.55	.64							

*: $p < .05$

According to the employment status, a significant difference ($p < .05$) was found in the dimensions of *fear of manager* (Welch F(2, 47.33) = 4.48) and *fear of colleagues* (Welch F(2, 61.75) = 5.75). Effect sizes ($d_{manager}$= -.02, $d_{colleagues}$ = -.01) indicate that the differences are moderate. Based on the quantitative findings, the teachers were asked, "Does your employment situation cause you to experience fear in your school? Why?" Regarding the question pointing out that the negative attitudes and approaches of school administrators towards contracted

teachers may create an element of fear, T7's opinion is as follows:

> "Due to the contract, our dismissal is based on easier terms. In addition, both the frequent warnings of our school administrators such as 'You are a contracted teacher, be careful' and the lack of legal rights compared to tenured teachers cause us to be more afraid and uneasy (T7)."

The opinion of T2, who stated that contracted teachers experience more fear than tenured teachers due to the lack of personal rights, is as follows:

> "I am a contracted teacher. We are more worried than the tenured ones. Tenured teachers have more legal rights. Because for tenured teachers, the fear of losing their job is less (T2)."

The opinion of T11, who stated that paid teachers' rights are insufficient and that they are afraid because of worries about their future, is as follows:

> "I work as a paid teacher. I am not afraid of the school administration or my colleagues. On the contrary, they have helped me a lot. However, in the legal sense, first and foremost, I have concerns about the future. I don't have job security; knowing that I work temporarily and then thinking I will be unemployed again scares me. So, I may have to quit my job at any time. Even this causes a person always to experience fear (T12)."

Qualitative findings show that contracted and paid teachers experience fears of the legal process more than tenured teachers. The Welch ANOVA test values based on professional seniority are presented in Table 7.

Table 7. Findings on professional seniority

Dim	Professional seniority	*N*	*Mean*	*SD*	Homogeneity		*df1*	*df2*	*F*	*p*	Dif.
					Levene	*p*					
Fear of manager	< 1 year	42	1.78	.86	6.13	.00	4	90.20	3.01	.02*	2-3
	1-5 years	107	1.70	.71							
	6-10 years	117	2.10	1.05							
	11-15 years	34	1.96	.96							
	> = 16 years	25	1.98	1.06							
Fear of colleagues	< 1 year	42	1.92	.96	3.24	.01	4	96.03	2.96	.02*	1-2 1-4 3-4
	1-5 years	107	1.57	.81							
	6-10 years	117	1.89	.98							
	11-15 years	34	1.51	.63							
	> = 16 years	25	1.68	.81							
Fear of legal process	< 1 year	42	1.89	.95	2.94	.02	4	92.43	1.59	.18	-
	1-5 years	107	1.60	.75							
	6-10 years	117	1.85	.98							
	11-15 years	34	1.62	.86							
	> = 16 years	25	1.73	.84							

∗: $p < .05$

A significant difference ($p < .05$) was found in the dimensions of *fear of manager* (Welch F(4, 90.20) = 3.01) and *fear of colleagues* (Welch F(4, 96.03) = 2.96) concerning *professional seniority*. Effect sizes ($d_{manager}$ = -.03, $d_{colleagues}$ = -.03) show that the differences are moderate. Based on the quantitative findings, the teachers were asked, "Is there any change in your level of fear as your professional seniority increases? Why?" Regarding the question, T10 emphasized that the fears of experienced teachers have decreased because the approach of school administrators and colleagues towards them is more positive:

> "…When you become an experienced teacher, the school principal's approach also changes. They show more oppressive management towards the teachers who start their duty new, but they approach more sensitively towards experienced teachers and are more careful when

> communicating. If you are experienced, your colleague's approach to you also changes; they behave more respectfully and value your opinions more (T10)."

T6 stated that as professional seniority increases, his experience also increases, he is more aware of his legal rights and responsibilities. Accordingly, his fears decrease, his opinion is as follows:

> "As my professional seniority increases, I feel more confident. Because when you are in the business, as the years pass, you both get to know the laws, regulations, administrations, and people better, learn how to behave, and people start to respect you. This, in turn, gives a person confidence (T6)."

T8, who emphasizes that with the increase in your professional seniority, knowing the school culture affects reducing your fears, his opinion is as follows:

> "As our professional seniority increases, we gain more experience in every sense. We understand students and parents better, we get to know them, and we adapt more easily to the socio-cultural environment of the school. In addition, we learn the culture and customs of the school thoroughly. In this sense, I can say that as seniority increases, our level of fear decreases (T8)."

Expressing the fears he experienced in the first year of his professional life due to the candidate teaching process, T2's opinion is as follows:

> "I am afraid legally because I am a candidate teacher. For example, I do not want to participate in the national exams. Because I am a candidate teacher yet and if I make a mistake, I have a fear of being fired from teaching (T2)."

Discussion

In this study, we investigated teachers' perceptions of the culture of fear in schools and the reasons for this, using mixed methods. We discussed the results in light of the relevant literature. Although it is seen in the research that the fear of managers has the highest average, it isn't the case. It is lower than expected. In his study, Kahraman (2019) also found that teachers have an intense fear in schools. In addition, Sincer and Atanur Baskan (2017) also found that academics' perceived levels of fear were low. Contrary to the quantitative findings, the qualitative findings show that teachers experience fear due to school principals' oppressive and authoritarian management style. This finding can be explained by the fact that school principals want to pressure teachers by using their legal power. Argon (2015) concludes that the factors that affect teachers' emotional states in schools the most are the characteristics of administrators, administrative processes in the school, supporting and valuing employees, and communication with administrators. School principals' adoption of a strict and authoritarian management approach may create fear and insecurity in teachers. Some research findings have shown that the oppressive attitude of principals can induce teachers to exhibit negative attitudes. For example, in the study of Karadaş and Özer (2021), a negative correlation is found between school principals' autocratic, disinterested, and oppositional management style and trust in the principal.

On the other hand, Sarıer and Uysal (2020) state that as school principals' autocratic leadership behaviours increase, teachers' level of exhibiting negative attitudes has also increased. It is also seen that school principals do not adopt a democratic and justice-based management approach, and they cannot provide a safe and sincere working environment to their employees. School principals, who have principal imperative behaviours, control every move of teachers in school, all their work, and transactions, to the smallest detail, and constantly follow them closely (Hoy & Tarter, 1997). School principals, who are primarily effective and responsible for achieving the goals of the schools, want to be aware of all the processes in the school. However, if they give the teachers the feeling that they are constantly being watched, they may cause teachers to feel insecure and fearful. It is common for teachers who feel under constant surveillance and are being watched to experience fear. Teachers may think that school principals do not trust them, and they are kept under continuous supervision. Even if there is no tangible element of fear, teachers who do not feel psychologically comfortable may cause them to fear. Therefore, some managerial attitudes and behaviours of school principals can create an atmosphere of fear and insecurity.

In the dimension of *fear of colleagues*, the teachers did not experience fear of their colleagues. In the study's qualitative findings, it was seen that the importance given to cooperation among colleagues, sincere relations based on trust, and shared common values came to the fore as the reason for this situation. However, it is

noteworthy that some stated that they experienced fear from colleagues. The feeling of competition among teachers harms relations; the threat of exclusion due to the lack of tolerance and respect for different views and opinions among teachers causes them to experience fear of colleagues. A study carried out by Chen (2016) indicates that teachers' interactions with their colleagues affect their emotions, and teachers are emotionally attached to their colleagues. Also, they feel optimistic about cooperating with their colleagues and getting support from them, but the competition among them is an aspect of teachers' fear and negatively affects their emotions. Another notable finding is that teachers feel anxiety when their words or behaviour are not respected in schools where there is no trust among colleagues. Moreover, their expectation of encountering a negative situation increases.Therefore, it is crucial for the employees of an organization to mutually trust each other to work more effectively towards reaching the determined goals (Mayer et al., 1995). In her study, Tschannen-Moran (2001) concluded that teachers' trust in their school colleagues positively affects cooperation. Teachers who trust each other can overcome challenges in school and reduce their fear of colleagues. In this context, colleagues at school need to cooperate based on trust.

While male teachers experienced more fear than females in all dimensions of CFS, the opposite was found in the qualitative part of the study. In the qualitative detail, the teachers explained the reasons for this situation; they saw patriarchal social structure, gender roles, gender-based segregation, gender-based stereotypes, and women's sensitive structure as the reasons for this situation. The fact that women experience more fear shows that their upbringing in a culture of fear in social life is also reflected in their business life. In the feminist theoretical approach, while women's limited participation and secondary position in working life are analysed, the concepts of gender and patriarchy come to the fore. The idea of gender emphasizes the sexual division of labour and social relations between the biological sexes. In this division of labour, while women have responsibilities such as house and child care, men are expected to take care of the livelihood of the house (Hartman, 1981).
The patriarchal system gives superiority to men in social relations that develop in society and makes men stronger (Hartman, 1979). On the other hand, patriarchy defines a set of social relations that include hierarchical relations and male-to-male solidarity that have a material basis and enable men to dominate women. Another critical point in the qualitative findings is behavioural differences between male and female managers. This difference has been seen as an essential factor affecting the relations between stakeholders in the school. The participants stated that school principals are primarily male, and this causes female teachers to experience more fear. The fact that female school principals attach importance to creating a more democratic and collaborative environment in their schools and adopting a sharing and participatory leadership style instead of coercive power in management processes may have been influential in the emergence of this result. Findings from the research have provided evidence supporting this situation. For example, Kawana (2004) stated that female school administrators are more involved, organized, and relationship-oriented. Similarly, Adams and Hambright (2004) concluded that female school administrators are more supportive, sensitive, understanding, creative, and innovative. Durrah (2009), on the other hand, revealed that female managers are seen as sincere leaders by creating a team spirit.

The perception of married teachers was higher than that of single teachers in *fear of the manager* dimension of CFS. In the qualitative findings, married teachers have more responsibilities, and deep financial concerns were the main reason. However, there are also qualitative findings that contradict the quantitative results. It is understood that single teachers experience more fear because they are generally young and inexperienced and because school administrators' approach to them is not constructive. Since single teachers are primarily new to the profession and do not have enough experience, they may have difficulty solving their problems compared to married teachers. The negative approach of the school administration primarily to single teachers during their candidate teaching process may have caused them to experience more fear. Another remarkable finding in the study is that it has been seen that marriage saves the individual from loneliness, and the social and emotional support that employees receive from their spouses affects their levels of psychological well-being positively. In this way, married teachers can be stronger and more resilient in dealing with difficulties in their work lives. The positive effect of the social and emotional support that married teachers receive from their spouses on their psychological state may have reduced their fears. Research findings also support this. In the literature in studies examining the relationship between marriage and psychological well-being (Williams & Dunne-Bryant, 2006), sharing economic resources and emotional support of individuals with their spouses generally have positive aspects. Married individuals have a higher level of psychological well-being compared to unmarried individuals. However, married teachers are more likely to act negligently in their business than single teachers due to their spouses, children, and other household responsibilities. Also, teachers are more likely to experience the fear of losing their profession due to the increase in financial concerns and the responsibilities brought by marriage.

In *fear of the manager* and *fear of the legal process* dimensions of CFS, teachers' perceptions of the culture of fear decreased as their seniority in the current school increased. The qualitative findings confirm the quantitative

results. The increase in seniority, development of relations with school administration, the increase of sincerity among teachers, and the increase in organizational commitment provide the development of some positive outputs for teachers. Depending on these reasons, it is understood that teachers' perceived fears decrease. However, Kahraman's (2019) finding contradicts the current finding. In the study as mentioned earlier, as the seniority in the current school increases, the level of fear experienced by teachers also increases. This contradiction could be due to the differences in the management style of the administrators depending on their working hours at the same school.In addition, the fact that new teachers do not have sufficient knowledge about school management may have been effective in not experiencing fear. With the increase in seniority at the current school, a better understanding of the internal and external dynamics concerning the school, the adoption of shared goals and values in the school, and the development of relations between administrators and teachers may have had an effect that reduced fears. In addition, teachers' increased commitment to the school and identification with their school over time may have reduced their anxiety. On the other hand, teachers' professional seniority increased as their seniority at their current school increased. In the study, teachers' perceived anxiety decreased with increased seniority.As the reason for this situation, teachers stated that they made fewer mistakes by emphasizing experience. They also stressed that their fears decreased as they became more aware of their legal rights and responsibilities.

The perceptions of contracted teachers in *fear of the manager* dimension of CFS are higher than tenured teachers. In the dimension of *fear of colleagues*, the perceptions of paid teachers were lower than those of tenured and contracted teachers. Hence, qualitative results do not confirm quantitative findings. It is understood that the lack of personal rights of contracted teachers compared to tenured teachers and administrators' negative attitudes and behaviours towards them cause them to be more afraid. Another employment type of teacher in Turkey is paid teaching practice. Paid teachers are worried because they do not have job security, their wages are low, and they have concerns about being fired from their jobs at any time. There is a tenured/contracted/paid distinction among teachers, and teachers have different rights, which can negatively affect teachers' emotional states.

Conclusion and recommendations

This research has provided some evidence for the existence of a culture of fear in schools. The findings show that teachers experience fears of administrators, colleagues, and legal processes in schools. Besides, this research also provides important implications about the causes of the culture of fear perceived by teachers. Many contradictions have emerged between the quantitative and qualitative findings in the study. We think these contradictions are closely related to the research subject's culture of fear. We believe that the teachers may have felt fear while answering the scale, worrying that their answers might be seen. However, thanks to the reliable and sincere interview environment we provided in qualitative interviews, we consider that teachers have expressed their views well. Even the fact that different findings were obtained from other methods may indicate a culture of fear in schools. In this context, we discuss some implications for practitioners and policymakers.

The management style adopted by the school principals and the human relations is the determining factor on the fears experienced by the teachers. Therefore, school principals should adopt a democratic and cooperative management style that emphasizes human connections and is based on justice. On the other hand, in order to reduce the fear of colleagues, the school administration should create a sincere environment among colleagues based on cooperation and trust. Moreover, a domain should be able to share its knowledge and experience easily. In order to reduce teachers' fear of the legal process, it is important to give priority to the reward system over the punishment system. It should not be forgotten that teachers often act illegally because they do not know it.Therefore, continually keeping the inquiry as an option will threaten teachers. Instead, teachers with low professional seniority must be informed about formal processes. Suppose administrators guide and direct teachers, especially in the first years of the profession, ensure their participation in decisions, and seek their opinions. In that case, their trust in their administrators can increase, and their fears can reduce. In the study, female teachers' fear of managers, colleagues, and legal processes is higher than male teachers. School management and male teachers should avoid a sexist approach and not show a harsh attitude towards female teachers. In the study, it has also been seen that the rareness of female school principals leads female teachers to fear. Therefore, policymakers should encourage female teachers and even implement positive discrimination in selecting principals for schools. It has been concluded that married teachers cope better with the difficulties at school with the support from their spouses. In this context, unmarried teachers should also be provided social and emotional support to help reduce their fears. In Turkey, teachers are employed on this threefold basis: permanent -under contract - paid. During the research, it was found that this difference causes anxiety among paid and contracted teachers. In this regard, both school stakeholders and policymakers have important roles to play in. School management should not discriminate between teachers working in different frameworks.

Teachers should also pay attention to this. Particularly, exclusionary and hurtful attitudes towards paid teachers should be avoided. At the same time, policymakers need to first improve paid teachers' economic and social rights. Even paid teaching should be abolished if the conditions are favourable. On the other hand, the distinction of tenured-contracted-paid should be eliminated, and a consistent form of employment should be introduced.

Limitations and future research

The first limitation is that there are limited studies on the culture of fear in schools. Therefore, the research results could not be adequately correlated with different results. Future research must focus more on the culture of fear in schools. In addition, the relationships between the culture of fear and various organizational variables should be researched. Moreover, the factors that may help teachers reduce their fears can be investigated. Secondly, the study is conducted in a province and only involves primary and secondary school teachers. Future research can be carried out with teachers working in different cities and at various school levels. In this way, we think it will be beneficial to compare and diversify research results. Third, only the fears of the manager, colleagues, and legal process were addressed. This limitation is related to the scale applied. It is essential that future research also focuses on fears experienced by teachers from students and parents. For this, different scales need to be developed.

Author (s) Contribution Rate

1. Author: 60%, 2. Author: 40%

Conflict of Interest

No potential conflict of interest was reported by the authors.

Ethical Approval

The research was deemed ethically appropriate by the decision of the Ethics Committee of Mardin Artuklu University with the number 2021/2-3.

References

Adams, K. L., & Hambright, W. G. (2004). Encouraged or discouraged? Women teacher leaders becoming principals. *The Clearing House: A Journal of Educational Strategies, Issues and Ideas*, *77*(5), 209-212. https://doi.org/10.3200/TCHS.77.5.209-212

Appelbaum, H. S., Bregman, M., & Moroz, P. (1998). Fear as a strategy: Effects and impact within the organization. *Journal of European Industrial Training*, *22*(3), 113-127. https://doi.org/10.1108/03090599810207944

Argon, T. (2015). Views of teachers regarding whether school administrators take teachers' state of emotions into consideration or not. *Abant İzzet Baysal University Journal of the Faculty of Education*, *15*(1), 377-404.

Ashkanasy, N. M., & Nicholson, G. J. (2003). Climate of fear in organizational settings: Construct definition, measurement, and a test of theory. *Australian Journal of Psychology*, *55*, 24-29. https://doi.org/10.1080/00049530412331312834

Chaiuk, T. A., & Dunaievska, O.V. (2020). Fear culture in media: An examination on coronavirus discourse. *Journal of History Culture and Art Research*, *9*(2), 184-194. https://doi.org/10.7596/taksad.v9i2.2636

Chen, J. (2016). Understanding teacher emotions: The development of a teacher emotion inventory. *Teaching and Teacher Education, 55*, 68-77. https://doi.org/10.1016/j.tate.2016.01.001

Creswell, J.W. (2013). Qualitative inquiry and research design: Choosing among five approaches (3rd Edition). Thousand Oaks: SAGE.

Creswell, J. W., Clark, V. L. P., Gutmann, M. L., & Hanson, W. E. (2003). *Handbook of mixed methods in social and behavioural research*. A. Tashakkori & C. Teddlie (Ed.). Advanced mixed methods research designs (pp. 223-227). Thousand Oaks, London: Sage Publications.

Cüceloğlu, D. (2001). *İçimizdeki biz.* Remzi Kitabevi.

Cüceloğlu, D. (2018). *Öğretmenim bir bakar mısın?* Final Kültür Sanat Yayınları.

Çelik, K., & Kahraman, Ü. (2019). Culture of fear in schools scale: Validity and reliability study. *Inonu University Journal of the Faculty of Education, 20*(2), 319-333. https://doi.org/10.17679/inuefd.537884

Dilekçi, Ü., & Nartgün, Ş.S. (2019). Adaptation of teachers' instructional emotions scale to Turkish culture and revision and descriptive analysis of the scale. *Educational Administration: Theory and Practice, 25*(1), 51-118. https://doi.org/10.14527/kuey.2019.002

Durrah, T. M. (2009). *A study of gender based school leadership and its perceived influence on the school climate.* (Unpublished doctoral dissertation). Union University.

Furedi, F. (2007). The only thing we have to fear is the 'culture of fear' itself. *American Journal of Sociology, 32*, 231-234.

Furedi, F. (2014). *Korku kültürü: Risk almamanın riskleri (B. Yıldırım, trans.).* Ayrıntı Yayınları.

Green, S.B., & Salkind, N.J. (2005). *Using SPSS for Windows and Macintosh: Analyzing and understanding data (4.edt.).* Pearson.

Hampton, T. J. (2013). *Know fear: how leaders respond and relate to their fears.* Education Doctoral Dissertations in Organization Development). University of St.Thomas. Minnesota. https://doi.org/10.1037/00223514.67.2.206

Hartmann, H. I. (1979). The unhappy marriage of marxism and feminism: towards a more progressive union. *Capital & Class, 3*(2), 1-33. https://doi.org/10.1177/030981687900800102

Hartmann, H. I. (1981). The family as the locus of gender, Class and political struggle: the example of housework. *Journal of Women in Culture and Society, 6*(3), 366-394.

Hoffman, J., Sabo, D., Bliss, J., & Hoy, W. K. (1994). Building a culture of trust. *Journal of School Leadership, 4*, 484-50. https://doi.org/10.1177/105268469400400503

Hoy, W. K., & Miskel, C. G. (2010). *Management theory, research and practice*. Nobel Printing Distribution.

Kahraman, Ü. (2019). *Effect of school administrators' management style, organizational DNA and organizational change on fear culture in schools* (Unpublished doctorate thesis). Pamukkale University, Denizli.

Karadaş, H., & Özer, N. (2021). Okul müdürlerinin yönetim tarzları ile müdür öğretmen ilişkilerinde güven. *International Journal of Society Researches, 17*(34), 125-153. https://doi.org/10.26466/opus.767321

Kawana, I. (2004). *Inspectors of educations perceptions of female principalship in the Rundu region of Namibia*. (Unpublished master's thesis). Rhodes University, Grahamstown.

Kline, R. B. (2011). *Principles and practice of structural equation modeling (3rd ed.).* Guilford Press.

Lerner, J. S., & Keltner, D. (2001). Fear, anger, and risk. *Journal of Personality and Social Psychology, 81*(1), 146-159. https://doi.org/10.1037/0022-3514.81.1.146

Mannoni, P. (1992). *Korku (I.Gürbüz, trans.).* Yeni Yüzyıl Kitaplığı.

Mayer, R. C., Davis, J. H. & Schoorman, F. D. (1995). An integrative model of organizational trust. *The Academy of Management Review, 20*(3), 709-734. https://doi.org/10.2307/258792

Patton, M.Q. (2005). *Qualitative research*. Sage, Thousand Oaks, CA.

Roseman, I. J., Wiest, C., & Swartz, T. S. (1994). Phenomenology, behaviours, and goals differentiate discrete emotions. *Journal of Personality and Social Psychology, 67*(2), 206-221. https://doi.org/10.1037/0022-3514.67.2.206

Sarıer, Y., & Uysal, Ş. (2020). The relationship between the leadership of school administrators and the negative attitudes and behaviours of teachers in Turkey: A meta-analysis study. *Anadolu Journal of Educational Sciences International, 10*(2), 1041-1065. https://doi.org/10.18039/ajesi.733950

Schein, E. (1985). *Organizational culture and leadership: A dynamic view*. Jossey-Bass.

Schermelleh-Engel, K., Moosbrugger, H., & Müller, H. (2003). Evaluating the fit of structural equation models: Tests of significance and descriptive goodness-of-fit measures. *Methods of Psychological Research Online, 8*(2), 23-74.

Sincer, S., & Atanur Baskan, G. (2017). Analyzing the relationship between culture of fear and burnout according to the perceptions of academics. *Journal of Higher Education & Science, 7*(3), 462-472. https://doi.org/10.5961/jhes.2017.223

Şişman, M., Güleş, H., & Dönmez, A. (2010). Qualifications framework for a democratic school culture. *Uşak University Journal of Social Sciences,3*(1), 167-182.

Taber, K.S. (2018). The use of cronbach's alpha when developing and reporting research instruments in science education. *Res Sci Educ, 48*, 1273-1296. https://doi.org/10.1007/s11165-016-9602-2

Thompkins, D.G. (2000). School violence: Gangs and a culture of fear. *The Annals of the American Academy of Political and Social Science, 567*(1), 54-71.

Thongsukmag, J. (2003). *Fear in the workplace: The relationships among sex, self efficacy, and coping strategies.* (Unpublished doctoral dissertation). Virginia Polytechnic Institute and State University, Blacksburg, Virginia.

Tschannen-Moran, M. (2001). Collaboration and the need for trust. *Journal of Educational Administration, 39*, 308-331. https://doi.org/10.1108/EUM0000000005493

Tudor, A. (2003). A (macro) sociology of fear? *Sociological Review, 51*(2), 238-254. https://doi.org/10.1111/1467-954X.00417

Williams, K., & Dunne-Bryant, A. (2006). Divorce and adult psychological well-being: Clarifying the role of gender and child age. *Journal of Marriage and Family, 68*(5), 1178-1196. https://doi.org/10.1111/j.1741-3737.2006.00322.x

Yılmaz, F. & Göçen, S. (2015). Students' views on culture of fear in education system. *Journal of Computer and Education Research*, *3*(6), 117-128.