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The Effect of Organizational Alienation on Individual-Organization Fit: An Application on Female Coaches

Research Article

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ABSTRACT

The aim of study is to examines the effect of organizational alienation levels of women coaches in sports organizations on individual organization fit. The relational survey method, which examines the relationship between two continuous variables, was used from quantitative research designs. The universe of the research consists of 628 female coaches working in the public and private sectors. The study sample, which was determined by the convenience sampling method, which is one of the non-probability sampling methods consists of 412 female coaches.. The study collected data with Organizational Alienation and Individual-Organization Fit scales. Data were analysed with correlation analysis and hierarchical regression analysis for impact analysis. It was observed that the level of organizational alienation of female coaches in sports organizations was at a high level, and the level of individual-organization fit was at a moderate level. The level of organizational alienation experienced by female coaches in sports organizations was found to have a negative and significant effect on individual-organization fit. According to this result, it has been determined by the study's findings that the individual-organization fit of female can be increased by taking measures to reduce the organizational alienation levels of female coaches by the managers of the organization.

Keywords:
Organizational Alienation, Individual Organization Fit, Female Coaches

Introduction

The participation of women in sports organizations has increased significantly over the last 40 years, due to both legislative interventions and national, local and regional programs to encourage women to engage

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in physical activity. Summer Olympics held in 2012 are known as the women's Olympics in history. However, this increase has not been reflected in women's leadership positions in sports at any level. However, this increase in women's participation was not reflected in the rate of being a leader in sports organizations (Burton & Leberman, 2017). Some studies reveal that women are prevented from participating in sports organizations. For example, women were prevented from participating in ski jumping competitions. Due to the standardization of rules and increased focus on the adjudication of style, the impact and power of an all-male corps of referees increased. Expressing predominant sentiments and views of the time, female participation in ski jumping was frowned upon and perceived as unladylike and even immoral (Andersen & Loland, 2017). The underrepresentation of women in leadership and management positions in sports organizations has attracted considerable empirical and theoretical attention. Several frameworks have been applied in the literature to understand better why this persistent trend continues (Sartore & Cunningham, 2007). Individual-organization fit is one of the most important issues that have attracted the attention of both academics and administrators who have studied the subject in depth in recent years. It can be said that individual-organization fit is related to the actors and results of the fit process between the employee and the organization they are in. Lewin (1951) is the first person to describe the essence of research on the fit between individuals and the organization in which they work as the behavior of individuals in the organization and their functionality with their environment. Individual-organization fit can be defined as the rules that must be followed between the expectations, attitudes, values and personality structures of individuals and the expectations, values and attitudes of the organization they work for (Chatman, 1989; Cable & Judge, 1996; Goodman & Svyantek, 1999; Kraimer, 1997; Muchinsky & Monahan, 1987). In the literature, some theories about individual-organization fit have been put forward. In his study, Kristof (1996) mentioned that when the organization's needs were met by the employees who made up the organization, and the organization met the needs of the employees, individual organizational fit would be achieved. In Chatman's (1989) individual organization theory, the main factor that facilitates the fit of employees with the organization is values, therefore, the compatibility of values will help individuals to adapt both to their environment and to the organization they work for. Schneider (1987), in his study, stated that the employees were not assigned to their duties by chance, and they sought and found the tasks that best suited their personality structures. Cable & Judge (1996), in their theory, stated that when individuals determined the compatibility with the characteristics of the organization, they wanted to take part in, they considered working as a reason for preference. The concept of alienation can be defined as the alienation of individuals from each other and their environment, the state of not belonging anywhere, the feeling of alienation to the person, indifference, insensitivity, and self-isolation (Ludz, 1996; Sidorkin, 2004). In the literature, it is possible to come across some studies that deal with and classify the subject of alienation (Blauner, 1964; Dean, 1961; Kohn, 1976; Middleton, 1963; Nettler, 1957). Five dimensions of alienation, which are frequently used in the literature, can be mentioned; Powerlessness, Meaninglessness, normlessness, isolation, and self-alienation (Seeman, 1959). The concept of organizational alienation, on the other hand, can be defined as being psychologically tired, exhausted, and little focus on work both inside and outside the organization, as a result of the insensitivity of the employees to the work they produce, the dissatisfaction they feel in their social relations, communication with their colleagues and fulfilling their responsibilities (Agarwal, 1993; Aiken & Hage, 1966; Banai & Reisel, 2007; Hirschfeld & Feild 2000). Employees experience some fundamental organizational problems when they feel that they see themselves as robots who only have to do the job, when they are surrounded by strict rules in working conditions, and when they realize that they cannot achieve organizational goals. One of these problems is alienation. As the feeling of alienation increases, loneliness causes dissatisfaction and a significant decrease in their commitment to work (Agarwal, 1993). As a result, female employees may lose their fit with the organization they work for in the process; With the increase in the sense of alienation of employees in public institutions, some studies have been found on the decrease in the fit of individuals with the organization (Özer et al., 2019; Yang et al., 2015; Eidi et al., 2020; Santas et al., 2016). The reason for this has been stated as

the fact that the organizational structures in the institutions are highly centralized, and the public is an important factor in the feeling of alienation of the employees (Aiken & Hage, 1966). No studies have been found in the literature examining the effect of organizational alienation experienced by women employees in sports organizations on their adaptation to the organizations they work for. In this regard, our study is believed to contribute to the literature. The study in which the organic bond between the individual and the organization in the individual-organization fit theory is investigated in depth is based on Lewin (1963). According to this study, individual-organizational fıt can be defined as the behavior of individuals in the organization and the function of employees with their environment. Fit is when one interacts happily with one's environment. It happens when the needs of individuals and the value judgments around them are balanced (Basaran, 2004). The study deals with the problem of alienation and individual-organization harmony experienced by female coaches in sports organizations. In this context, the results of the study are important in terms of bringing solutions to these problems experienced by female coaches; There are studies in different samples in the literature on the effect of organizational alienation on individual-organization fit, but no study has been found on female trainers in sports organizations. In this respect, it is thought that the present study will contribute to the literature. Based on this essence, the aim of our study is to examine the effect of the organizational alienation levels experienced by female coaches working in the public and private sectors on individual-organization fit.,

Methodology

Research model

In this study, which aims to examine the effect of organizational alienation experienced by female coaches workers in the institution they work on individual-organization fit, the relational survey method, which examines the relationship between two continuous variables, one of the quantitative research designs, was used (Büyüköztürk, 2016; Gürbüz & Şahin, 2016). This research design was chosen because the effect of organizational alienation on individual-organization fit in women coaches in public and private sectors is unclear.

Population and Sample of the Research

The universe of the research consists of 628 female trainers working in Istanbul, Antalya and Izmir Provincial Directorates of Youth and Sports and in 3 fitness centres (public and private sectors) operating commercially. Convenience sampling method, which is one of the non-probabilistic sampling methods, was used in the study. The sample of the study consists of 412 female trainers working in Antalya İzmir and İstanbul Provincial Directorates of Youth and Sports and 3 fitness centers operating commercially.

Descriptive statistics for the sample of the current study are given in Table 1.

Table 1. Descriptive statistics on female sports employees

Variables	*Groups*	*f*	*%*
Marital Status	Single	128	31,1
	Married	284	68,9
Age	24-28	148	35,9
	29-32	215	52,2
	33-36	49	11,9
Working Time	1-3 Year	101	24,5
	4-7 Year	168	40,8
	8 Year and Above	143	34,7

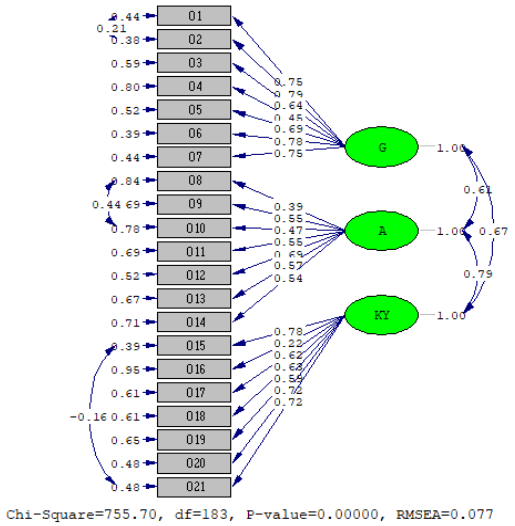
As seen in Table 1, 31.1% of the women who participated in our study were single, 68.9% were married, 35.9% were between 24-28 years old, 52.2% were 29-32 years old, 11.9% were 33-36 years old, 24.5% had worked for 1-3 years, 40.8% had worked between 4-7 years, 34.7% of them were female coaches in public and private sectors who had worked for 8 years or more.

Data collection tool

First of all, ethics committee approval was obtained from Inonu University for the current study. Data collection permission was obtained from the institutions with the approval of the ethics committee. After the universe of the study was determined, the scales were sent to 628 female coaches in an electronic environment. Feedback was provided with 420 answered scale forms. However, 8 scales were excluded from the analysis because they were against the answering rules, and 412 scales were included in the analysis in accordance with the purpose of the study. To determine the organizational alienation and individual-organization fit levels of female sports employees, developed by Mottaz (1981) and adapted into Turkish by Uysaler (2010), a 5-point Likert-type "Organizational Alienation" scale consisting of 21 items, three of which are "Powerlessness", "Meaninglessness" and "Self-Alienation", and 5-point Likert-type "Individual-Organization Fit" scales developed by Netemeyer et al., (1997), consisting of 4 items in total, were used. Internal consistency reliability coefficient analysis for the sub-dimensions of the organizational alienation scale was determined as Weakening (α=.91), Meaninglessness (α=.79), Self-alienation (α=.87). In the current study, these values were determined for the subscales of Weakening (α=.87), Meaninglessness (α=.79), Self-alienation (α=.74). The internal consistency reliability coefficient of the Individual-Organization Fit scale was determined as (α=.91). In the current study, it was determined as (α=.94); According to these results, it can be said that the internal consistency reliability of the scale items used In the current study is quite high; Since our data are suitable for normal distribution, correlation analyses were used from parametric tests to determine the relationship between two continuous variables, and hierarchical regression analyses were used to measure the effect.

Analysis of Data

In the present study, frequency, percent mean and standard deviation values were determined from descriptive statistics. Normality analysis was performed to analyze the distribution of the data. Confirmatory factor analysis was performed to validate the model regarding the data collection tools used. Correlation analysis was performed to measure the direction and strength of the relationships between the scale and its sub-dimensions. Hierarchical regression analysis was performed to measure the effect of the independent variables on the dependent variable step by step.



G: Weakening; A: Meaninglessness; KY: Self Alienation

Figure 1. Confirmatory factor analysis of the organizational alienation scale

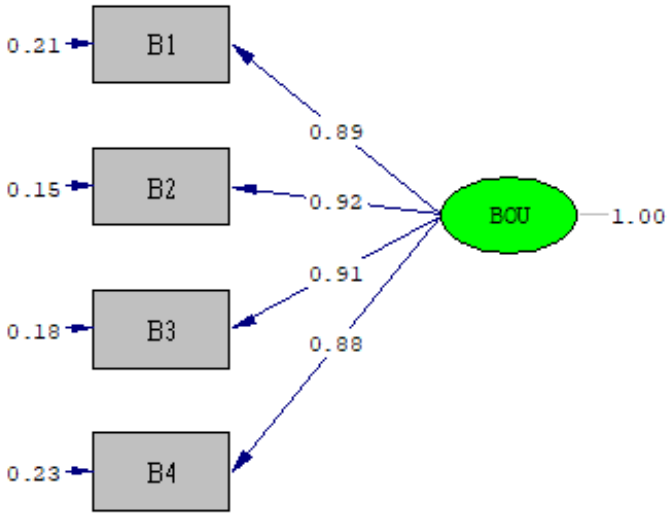
The goodness fit indexes related to the organizational alienation scale are given in Table 2.

Table 2. Values of compliance criteria for the established organizational alienation confirmatory factor analysis model

Compliance Criteria	Excellent Rapport	Acceptable Rapport	Developed Scale Belonging Values
$\chi 2/sd$	≤3	≤5	4,1
RMS	0 <RMSEA<0.05	0.05 ≤ RMSEA ≤ 0.10	,77
SRMR	0 ≤SRMR <0.05	0.05 ≤ SRMR ≤ 0.10	,06
NFI	0.95 ≤NFI ≤1	0.90 ≤NFI ≤ 0.95	,94
NNFI	0.95 ≤NNFI ≤1	0.90 ≤NNFI ≤ 0.95	,95
CFI	0.95 ≤CFI ≤1	0.90 ≤CFI ≤ 0.95	,95
GFI	0.95 ≤GFI ≤1	0.90 ≤GFI ≤ 0.95	,90
AGFI	0.90 ≤AGFI ≤1	0.85 ≤AGFI ≤ 0.90	,85
IFI	0.95 ≤CFI ≤1	0.90 ≤IFI ≤ 0.95	,95
RFI	0.95 ≤RFI ≤1	0.90 ≤RFI ≤ 0.95	,93

Source: Schermelleh-Engel and Moosbrugger, 2003).(RMSEA: Root Mean Square Error of Approximation, SRMR: StandardizedRootMeanSquareResidual, GFI: Goodness of Fit Index, AGFI: AdjustedGoodness of Fit Index)

As seen in Table 2, it was determined that the values related to the organizational alienation scale were within the acceptable fit index. As a result of the confirmatory factor analysis, it was found that the items confirmed the relevant factors at 99% confidence level (p<0.01 p=0.000), the fit indices were between acceptable fit values, and the fit of the model was between acceptable fit values (X2/df=755.70/183≤5).



BOU: Individual Organization Fit

Figure 2. Confirmatory factor analysis of the individual-organization fit scale

The goodness fit indexes related to the individual-organization fit scale are given in Table 3.

Table 3. Values of fit criteria for the established individual-organization fit scale confirmatory factor analysis model

Compliance Criteria	Excellent Rapport	Acceptable Rapport	Developed Scale Belonging Values
$\chi 2/sd$	≤3	≤5	3,9
RMS	0 <RMSEA <0.05	0.05 ≤ RMSEA ≤ 0.10	,25
SRMR	0 ≤SRMR <0.05	0.05 ≤ SRMR ≤ 0.10	,23
NFI	0.95 ≤NFI ≤1	0.90 ≤NFI ≤ 0.95	,97
NNFI	0.95 ≤NNFI ≤1	0.90 ≤NNFI ≤ 0.95	,91
CFI	0.95 ≤CFI ≤1	0.90 ≤CFI ≤ 0.95	,97

GFI	0.95 ≤GFI ≤1	0.90 ≤GFI ≤ 0.95	,94
AGFI	0.90 ≤AGFI ≤1	0.85 ≤ AGFI ≤ 0.90	,93
IFI	0.95 ≤CFI ≤1	0.90 ≤IFI ≤ 0.95	,97
RFI	0.95 ≤RFI ≤1	0.90 ≤RFI ≤ 0.95	,91

Source: Schermelleh-Engel and Moosbrugger, 2003).(RMSEA: Root Mean Square Error of Approximation, SRMR: StandardizedRootMeanSquareResidual, GFI: Goodness of Fit Index, AGFI: AdjustedGoodness of Fit Index)

As seen in Table 3, it was determined that the values related to the individual-organization fit scale were between the values of the perfect fit index. As a result of the confirmatory factor analysis, it was found that the items confirmed the relevant factors at 99% confidence level (p<0.01 p=0.000), the fit indices were between perfect fit values, and the fit of the model was between perfect fit values (X2/df=7.85/2≤5).

Findings

In this section, analyzes of the collected data are given. Normality analysis, descriptive statistics, correlation and hierarchical regression analyzes were made.

The normality analysis of the scales and their sub-dimensions is given in Table 4.

Table 4. Normality analysis of scales and sub-dimensions

Scales and Sub-Dimensions	$\bar{x}$	Median	Mod	sd	Skewness	Kurtosis
Organizational Alienation	70,56	71,00	68,00	13,58	-0,260	-0,412
Weakening	22,41	24,00	26,00	6,02	-0,503	-0,282
Meaninglessness	24,47	25,00	28,00	4,84	-0,231	-0,326
Self Alienation	23,67	24,00	26,00	5,46	-0,350	-0,399
Organization-Individual Fıt	12,52	14,00	16,00	4,37	-0,355	-0,861

As can be seen in Table 4, when the descriptive statistics of the data obtained using the scales and their sub-dimensions were examined, it was seen that the mean, median, and mode values were close to each other, and the skewness and kurtosis values were within ± 1.96 (Lin & Shao, 2002; Peryy & Shao 2002; George & Malley, 2010). It is thought that the data collected for our study are normally distributed. Based on this result, it was decided to use parametric test analyses for data analysis.

The descriptive statistics of the scale and its sub-dimensions used in the study are given in Table 5.

Table 5. Descriptive statistics on female sports employees

Scales	n	Minimum	Maximum	$\bar{x}$	sd
Organization-Individual Fıt	412	4	20	12,52	4,37
Organizational Alienation	412	33	104	70,56	13,58
Weakening	412	7	35	22,41	6,02
Meaninglessness	412	11	35	24,47	4,84
Self Alienation	412	8	35	23,67	5,46

As seen in Table 5, it was determined that the organizational alienation levels of women employees in sports organizations in the institutions where they worked were high ($\bar{x}$=70.56), the level of individual-organization fit ($\bar{x}$=12.52) was moderate, and among the organizational alienation subscales, Powerlessness was moderate ($\bar{x}$=22.41), Meaninglessness was moderate ($\bar{x}$=24.47), and self-alienation was high ($\bar{x}$=23.67).

The direction and strength of the relationship between the scales and their sub-dimensions are given in Table 6.

Table 6. Correlation analysis between the Scale and Sub-dimensions

Variables	Scale and Sub-Dimensions	$\bar{x}$	sd	1	2	3	4	5
1	Organization-Individual Fıt	70,56	13,58	1				
2	Organizational Alienation	22,41	6,02	,825**	1			
3	Weakening	24,47	4,84	,803**	,450**	1		
4	Meaninglessness	23,67	5,46	,864**	,549**	,612**	1	
5	Organization-Individual Fit	12,52	4,37	**-,561****	**-,469****	**-,444****	**-,483****	1

As seen in Table 6, a statistically negative and moderately significant relationship was found between the mean organizational alienation total scale score (r= -.561) and the sub-dimensions of Powerlessness (r= -.469), Meaninglessness (r= -.444), and self-alienation (r= -.483), and the mean score of individual-organization fit.

The effect of the independent variables on the dependent variable is given in Table 7.

Table 7. Impact analysis of organizational alienation on individual-organization fit

	Model 1					Model 2				
Independent Variables	**B**	**SH**	**β**	**t**	**p**	**B**	**SH**	**β**	**t**	**p**
Marital Status	-,817	,419	-,086	-1,951	0,052	,058	,357	,006	,163	0,871
Age	,030	,255	,005	,116	0,908	-,061	,211	-,011	-,286	0,775
Working Time	-,216	,251	-,039	-,863	0,389	-,198	,211	-,035	-,939	0,348
Weakening						0,190	0,032	**-,262**	5,922	**0,000****
Meaninglessness						0,171	0,042	**-,190**	4,097	**0,000****
Self Alienation						0,179	0,04	**-,224**	4,511	**0,000****
R		,10					,56			
R^2		,010					,31			
Adjusted R^2		,003					,30			
R^2		,010					,30			

**p<0,01; The dependent variable: Organization-Individual Fıt; Standardized values were used.

As seen in Table 7, it was determined that the variables of marital status, age, working time in the institution of female coaches in public and private sectors model 1 did not have a significant contribution to the regression model. In Model 2, it was determined that organizational alienation made a statistically significant contribution to the regression model, which includes the effects of Weakening, Meaninglessness, and self-alienation sub-dimensions on individual-organization fit [F(1-527)=34.389;p=.000;p<0.01). It was determined that the 31% variance in the individual-organization fit was explained by the sub-dimensions of organizational alienation, Weakening, Meaninglessness, and self-alienation. In addition, the inclusion of the powerlessness, meaninglessness, and self-alienation sub-dimensions in the regression model explained the additional 30% variance in the individual-organization fit, and this change in R2 was found to be significant [F(3-521)=77.615;p=.000;p<0.01]. When all independent variables are entered into the regression model, and coefficients are considered, Powerlessness (β= -.262; p<.01), Meaninglessness (β= -.190; p<.01), and self-alienation (β= -.224; p<.01) have a negative and significant effect on individual-organization fit. It was found that all independent variables explained the 31% variance in the individual-organization fit**.**

Discussion and Conclusion

In this study, which focuses on the effect of organizational alienation on individual-organization fit, it has been observed that female coaches in public and private sectors generally have a high level of organizational alienation and a moderate level of individual-organization fit (Table 3). It results in the disconnection of individuals who experience the concept of self-alienation with themselves and their connection with other people. Moreover, they can present their abilities and personality as a marketable product in order to gain status in the institution they work for. This approach can also distance individuals from their real existence (Neal, 1963; Dean, 1960). In the current study, it is thought that the reason for the high

level of alienation among female coaches in public and private sectors in the institution they work in is that the efforts of the women working in the institution to see, appreciate and reward their talents in order to achieve a certain status are not seen, appreciated and approved by the managers of the institution. In studies of (Saia et al., 2014; Nazari et al., 2019), which are in line with the results of the current study, the level of organizational alienation is seen as an important effect variable in female coaches. Unlike our study, in the studies of (Çelik & Damar, 2017; Gholipour et al., 2010; Özbek, 2011) a positive and significant relationship was found between organizational alienation and its sub-dimensions and individual-organization fit. It is thought that the reason for this is the difference in the sample and the answers given to the reverse items in the organizational alienation scale. a different study showed that women may stay away from seeking advancement opportunities in sports organizations as a result of inconsistencies between the identity standard of women and the inputs of others (reflective assessments) (Sartore & Cunningham,2007). In the present study, it was observed that there was a moderately significant negative relationship between the sub-dimensions of the organizational alienation experienced by female coaches in sports organizations in their institutions and the levels of individual-organization fit. According to these results, it has been determined that as the levels of Powerlessness, Meaninglessness, and self-alienation of women employees in sports organizations increase in their institutions, their fit with the organization they work in decreases. The concept of disempowerment in the literature refers to the fact that the individual does not have the right to speak about the activities they produce and perform in the process, and individuals who experience Powerlessness have the feeling that top managers make decisions on their lives (Seeman, 1959; Hoy, 1972). It has been stated that the reason for the feeling of Powerlessness is generally the areas of struggle where men persistently maintain their positions at the top of the organizational hierarchy (Piggott, 2019). In this respect, it is thought that the reason why female coaches in public and private sectors experience the feeling of Powerlessness in the institutions they work for is the result of not receiving their thoughts or ideas about the work they produce overtime or the result of the work, and not being given the right to speak. The concept of Meaninglessness occurs as a result of the inability of individuals to fully understand the difference between the work they produce and the work done by other colleagues in the enterprise (Shepard, 1972). In this sense, it is thought that female coaches in public and private sectors have no idea about the work they produce and the work their colleagues put forth while fulfilling the instructions from the senior management, and the fact that the female employees in the institution do not share the details of their duties with their colleagues are effective in the meaningless processes of the female employees, current study it was determined that demographic variables such as marital status, age and, working time did not have a significant effect on individual-organization fit. However, it was observed that the levels of Meaninglessness (β= -.190), Powerlessness (β= -.262), and self-alienation (β= -.224) of organizational alienation had a negative significant effect on individual-organizational fit. According to these results, it has been determined that female coaches in public and private sectors are alienated from their organization at the highest level of disempowerment. In order to minimize the level of disempowerment experienced by female employees towards the organizations they work for, measures such as senior management taking the opinions of women in the production process, including female employees in the production process at the meetings held by the manager of the unit they work for, their participation in the decisions taken and increasing the level of participation in the management can be taken, and their fit with the organization they work for can be increased. Furthermore, the dimension of Meaninglessness arising from the conflict of organizational goals with the personal roles of female employees (Shepard, 1972) prevents women from integrating with organizational goals. Although the female coaches, who constitute the sample of the current study within the framework of the division of labour in the organization, worked for the same unit directorate for years, and this led them to become experts in doing their own work, the fact that they did not have any idea about the work done in other units of the organization resulted in both their alienation and Meaninglessness. It is thought that this situation will make important contributions to the fact that female coaches are subject to rotation within the organization for certain periods, to dominate all the work done in

the organization over time, to reduce the level of Meaninglessness they experience, and therefore to better adapt to the organization; Since there are no studies in the literature on the effect of organizational alienation on individual-organization fit among female coaches in public and private sectors, studies that are parallel to the results of our study in some respects and conducted in different institutions have been encountered (Krouse, 2020) in his study on higher education institution employees, determined that organizational alienation is an important variable on individual-organization fit. In another study on teachers, (Nadı & Alsafi, 2014) revealed that there was a negative significant relationship between individual organizational fit and organizational alienation.

In this study, which deals with the effect of organizational alienation levels of female coaches in public and private sectors on individual-organization fit, it was determined that female coaches in public and private sectors generally have high levels of organizational alienation, and individual-organizational fit levels are moderate. Particularly, the further inclusion of female coaches in public and private sectors in the management, the value of their thoughts and ideas about the work they produce during the production process, is an important factor in their adaptation to the organization they work for, by reducing the feeling of Powerlessness, by which the alienation to the organization is at the highest level.

Conflict of interest

The authors declare that they have no conflict of interest

Ethics Committee Approval:

Ethical approval was obtained for the current study with the decision of Malatya Inonu University dated 22.09.2022 and numbered 2022/17-14.

Recommendations

In our study, the effect of organizational alienation experienced by female employees in institutions on individual-organization harmony was examined. In future studies, the relationship between individual-organization harmony and awareness can be examined.

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Debt Restructuring of the Big Four Clubs; Money Dependent Systems in The Globalizing Football Industry

Research Article

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ABSTRACT

It is observed that the debts of the big four clubs of the Turkish Super League have reached enormous sizes and this situation is not sustainable in the globalizing football industry market. The main purpose of this study, which uses the document analysis method, is to analyze the economic sustainability of the debt restructuring of the big four clubs. In the study, the literature related to the football industry was examined, and the economic data of the big four clubs and their league organizations from past to present were subject to document analysis and inferences for the purpose of the study were presented as a result of the information obtained. In conclusion, it can be stated that the debt situations of the big four clubs cannot be solved with the debt restructuring system, and the Turkish sports system lies at the root of the current economic problems.

Keywords:
Football industry, football clubs, debt restructuring

Introduction

Modern football, which emerged in England in the 19th century, has been in a process of change since the beginning of the 1990s and has turned into a large industry with a commercial dimension. Professionalism, removal of the wage ceiling, sponsorship and advertising agreements, matchday revenues, player contracts and the construction of new stadiums have been effective in the commercialization of football with the economic added value it creates in addition to being a sport branch. However, the lion's share of television in the industrialization of football should not be overlooked. With the widespread broadcast of football matches on television, football, which has gained a global identity, has become an industrial phenomenon by creating its own culture and economy. Of course, in addition to these positive developments, the level of indebtedness

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and budget deficits of football clubs reaching to significant figures are perceived as danger signals in industrial football (Güngör, 2014; Saban & Demirci, 2016).

Participating in high-budget international leagues and achieving athletic success from there provide serious financial resources to football clubs. The resources obtained from sports achievements play an important role in reducing the financing gap, which has become the most important problem of clubs both in Europe and in Turkey (Güngör, 2014). From the point of view created by this perception, Turkish Super League club managers see the championship as salvation with the numerous populist transfers they have made with the ambition of aiming only to set the championship as their goal, by not learning from the huge debts created by the wrong management styles of their successors in the historical process, and the expenses to play to the tribunes. However, it is clear for everyone that the incomes of the big four clubs of the Turkish Super League increase every year without meeting their accumulated debts, such financial risks as interest and exchange rate differences cause the debts to grow, they see minus digits in their equity and this situation is not sustainable. As a matter of fact, with the contributions of our Clubs and Banks Association, the Ministry of Youth and Sports and the Turkish Football Federation, they have prevented this problem from being made visible for now by restructuring the debts of our big four clubs to the banks under the patronage of politics. For this reason, the importance of financial management emerges for both clubs in international leagues and many institutions (Ademosu & Morakinyo, 2021).

The main purpose of this study is to analyze the economic sustainability of Turkish football by examining the debt restructuring of the big four clubs in the Turkish Super League on the axis of the dimensions of the globalizing football industry. In the study, the literature on globalization, the football industry and the economic and financial structures of football has been examined, and after economic dimensions of Turkish clubs and other European clubs from past to present and the relevant league organizations have been subject to document analysis in the light of current data, findings obtained were associated with the economic and financial structures of football and inferences for the purpose of the study have been presented.

Globalization and Football Industry

With the globalizing economy, the neo-liberal policies that allow the free movement of capital, the narrowing of the influence of the state monopoly, and the opportunity to broadcast to millions of people with new media technologies in this new world competitive order caused the giant media companies not to remain indifferent to football attracting massive demand. With the effect of encrypted broadcasting brought to life by the televisions and new technologies that came into our lives after private radios and the digital broadcasting system, football began to be marketed as a product and usage rights were incurred during the delivery of the created product to the masses. Thus, it gained an important commodity value of trillions of liras in match broadcasting rights and watching property relations. The football product, created by TV with the effect of technological developments, gained a much more valuable feature than live watching and offered economic gains to teams, leagues, organizations and athletes that they could not imagine (Saban & Demirci, 2016; Erdoğan, 2008). The globalization economy has become the determinant of its industrial power, especially the financial structure of both football and many international businesses and the institution. For this reason, financial management emerges as an important concept on both football and other financial structures (Sedegah & Odhiambo, 2021).

Financial Fair Play and its Effect on Debt Restructuring in the Globalizing Football Industry

The Union of European Football Associations (UEFA) imposes some sanctions, the degree of compatibility of which is determined by the financial performance criteria of the clubs, by taking into account the imbalances in revenue and expenditures on the basis of clubs, the negativities experienced in the transfer

budgets and the borrowing levels created by these. Ensuring that the financial structures of football clubs have a transparent, realistic, stronger and optimum debt structure is the main goal of the financial Fair Play being the most important of these sanctions. Thus, the balanced competition created in football will contribute to the sustainability of the football economy (Güngör, 2014).

The big four clubs of the Turkish Super League are in a financial dead-end because of their ever-growing debts. The big four clubs, which were dragged into debt swamp due to many reasons mentioned in the conclusion section of the research in detail, have come to a position where they cannot pay their accumulated debts, as well as adding new debts to their accumulated debts day by day by putting their financial sustainability into crisis.

Under the auspices of politics, with the coordination of the relevant institutions and as a result of the agreement reached between the Banks Association of Turkey, banks and clubs, the structuring, which was carried out for a total of 5 years, two years of which was without principal repayment, has been revised and it has been announced as far as it is reflected to the public that it will be restructured for 9 years without 2 years of principal payment through the agreements that each club will make with the bank to which it owes without disclosing the details.

Methodology

Qualitative research model was used in our study, which aims to determine the situation of Turkish football within the globalizing football industry. Document analysis technique was utilized in the process of obtaining and interpreting the data within the context of the qualitative research model. Collecting written and web-based information and documents related to the cases examined in the study, scanning them systematically and making descriptions, analyzing the revealed information with an inductive approach and making convincing generalizations is called document analysis (Bowen, 2009; Büyüköztürk, 2011; Creswell, 2002; Seale, 1999; Yıldırım, 1999). In this regard, written and web-based literature (articles, reports, KAP (Public Disclosure Platform) data and web-based newspapers) diversified in a way to enhance the reliability of the study, which is related to the globalization, football industry and the economic and financial structures of football, was examined. The data were collected by classifying the position of the Turkish football organization within the European football organization and the status of the Turkish Super League organization specific to the four big clubs. All data collected were sub-classified over the concepts that contain success, transfer and value comparison of European and Turkish football organizations, Turkish Super League team values and pool costs, financial balance sheets of the four big clubs for the last ten years, and the economic dimensions of the Turkish clubs and other European clubs and the league organizations they have taken part in from past to today were systematically scanned in the light of current data and turned into tables through which holistic descriptions would be made. The information revealed as a result of the analyzes was associated with the economic and financial structures of football, and the discussion and conclusion part of the research was obtained with the inferences reached for the purpose of the study.

Findings

Analysis of the Situation of the Globalizing Sports Industry with Examples from the Turkish and European Leagues

Analyzing the stage of the globalizing sports industry with examples from the Turkish and European Leagues in the light of some up-to-date data is important in understanding the management and structural problems of clubs and league organization and determining the dimensions of economic problems.

Table 1. Countries' performance in the last ten years in the football money league

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
1	Spain	Spain	Spain	Spain	Spain	England	England	Spain	Spain	Spain
2	Spain	Spain	Spain	England	Spain	Spain	Spain	Spain	Spain	Spain
3	England	England	Germany	Germany	England	Spain	Spain	England	England	Germany
4	Germany	Germany	England	Spain	France	Germany	Germany	Germany	Germany	England
5	England	England	France	France	Germany	England	England	England	France	England
6	England	England	England	England	England	France	England	France	England	England
7	Italy	England	England	England	England	England	France	England	England	France
8	Italy	Italy	England	England	England	England	England	England	England	England
9	England	England	Italy	England	England	England	England	England	England	England
10	Germany	Italy	Italy	Italy	Italy	Italy	Italy	England	Italy	Italy
11	England	Germany	Germany	Germany	Germany	Germany	England	Italy	England	England
12	England	Italy	England	Italy	England	England	Germany	Germany	Germany	Germany
13	Italy	England	Germany	England	Germany	Spain	Spain	Spain	Spain	Spain
14	France	Germany	England	Germany	Italy	Germany	England	Italy	Italy	Italy
15	Italy	Italy	Italy	Spain	Spain	Italy	Italy	Italy	Germany	Russia
16	Germany	France	Turkey	Italy	Italy	Italy	Germany	Germany	Italy	Germany
17	France	France	Germany	Italy	England	Russia	England	England	France	England
18	Germany	Germany	Turkey	Turkey	England	England	England	Italy	England	France
19	Spain	Italy	Italy	England	Italy	Italy	Italy	England	England	Italy
20	Italy	England	Spain	England	England	England	England	England	Italy	Germany
21	Portugal	Spain	Germany	England	Turkey	England	France	Italy	Italy	Spain
22	Spain	Portugal	Italy	England	England	England	Italy	England	England	England
23	Germany	Spain	Spain	France	England	England	Russia	England	Neth.	Portugal
24	England	Neth.	Brasil	Italy	England	France	Italy	England	Portugal	Germany
25	England	Germany	England	England	England	Turkey	Germany	Russia	England	England
26	Neth.	England	Portugal	Portugal	England	Turkey	England	Turkey	Spain	England
27	Germany	England	Neth.	England	England	Portugal	England	Spain	Germany	Neth.
28	England	England	Italy	Germany	England	Germany	England	France	Russia	England
29	England	England	England	England	England	England	England	England	Portugal	England
30	England	Turkey	France	England	Italy	Italy	Portugal	Portugal	England	Italy

Source: Deloitte Sports Business Group, 03 June 2021

When the data in Table 1, taken from the report published by Deloitte Football Money League, are analyzed, we see that the countries hosting the five major leagues clearly come to the fore in terms of the value they produce in monetary terms. Turkey took place in the ranking 8 times in total in 2013, with Galatasaray 5 times, Fenerbahçe 2 times and Beşiktaş 1 time included in the ranking.

Table 2. European countries organizations and market values

Country	League	Team	Player	Mean Age	Foreign Player	Total Market Value €
England	Premier Lig	20	517	27.3	63.10%	8.57 Billion
	Championship	24	674	26.3	48.02%	1.26 Billion
	FA Cup	125	3371	26.3	35.20%	10.08 Billion
	EFL Cup	92	2517	26.1	40.90%	10.06 Billion
	Community Shield	2	55	26.5	72.70%	1.56 Billion
Italy	Serie A	20	554	27.3	60.60%	5.14 Billion
	Serie B	20	576	26.6	28.60%	406.05 Million
	İtaItaly Cup	78	2152	26.3	29.70%	5.69 Billion
	Supercoppa Italiana	2	49	27.4	69.40%	1.21 Billion

Spain	La Liga	20	507	27.8	38.90%	4.90 Billion
	La Liga 2	22	568	27.1	26.90%	455.05 Million
	Copa del Rey	127	2911	27.2	20.40%	5.54 Billion
	Super Copa	4	104	26.6	34.60%	1.13 Billion
Germany	Bundesliga	18	529	25.7	54.60%	4.56 Billion
	Bundesliga 2	18	503	26.4	29.80%	341.05 Million
	DFB Pokal	64	1786	25.9	31.04%	4.98 Billion
	DFL Super Cup	2	56	25.7	51.80%	1.41 Billion
France	Ligue 1	20	556	25.6	48.70%	3.63 Billion
	Ligue 2	50	579	25.7	35.90%	369.03 Million
	Coupe De France	174	4313	26.6	25.90%	4.12 Billion
	Super Coupe	2	63	25.6	57.10%	1.05 Billion
Portugal	Liga Nos	18	504	26.1	62.50%	1.16 Billion
	Liga Portugal 2	18	502	26.2	45.20%	102.01 Million
	Taça Del Portugal	163	3169	26.2	36.90%	1.29 Billion
	Super Taça	2	55	26.6	65.50%	527.90 Million
Netherlands	Eredivisie	18	490	24.8	45.50%	1.03 Billion
	Keuken Divisia	20	558	23.2	25.80%	179.53 Million
	Toto Beker	110	2465	25.3	16.30%	1.14 Billion
Russia	Premier Liga	16	402	26.8	33.30%	981.08 Million
	1. Division	22	616	25.8	9.10%	179.66 Million
	Kubok Rossii	90	2363	25.5	8.30%	1.29 Billion
	Superkubok Rossii	2	48	25.3	34.30%	258.88 Million
Turkey	Super League	21	618	26.2	51.50%	827.88 Million
	1st League	18	535	27.4	26.00%	109.78 Million
	Turkish Cup	145	4083	25.5	12.70%	1.02 Billion
	Super Cup	2	61	26.6	44.30%	146.18 Million

Source: Transfermarkt, 07 May 2021

According to Table 2, Premier League ranks first by far with a value of 8.57 Billion Euros while Super League is the ninth league in Europe with a value of reaching to 827.88 Million Euros. With a value of 8.57 Billion Euros, the Premier League generates more than ten times the value of the Super League. In addition, we see in Table 3 that the Premier League has doubled the other leagues on average in terms of the cup organization created and the lower leagues in terms of market value, it is way ahead of the Super League and Super League is in the ninth place in this lane as well in terms of its total value. The league with the highest number of foreign players is the Premier League, which is a group of stars. Our country league is the leader in this regard with the number of 618 players. While the percentage of foreign players in the Premier League reaches 63.10%, the percentage of foreign players in our country reaches 51.50%. We can see the globalizing dimension of the sport just by looking at the percentage of foreign players.

Table 3. 2020-21 Season values of super league clubs

No.	Club	Number of Players	Mean Age	Number of Foreign Players	Total Market Value €
1	Galatasaray SK	28	28	16	99.03 Million
2	Fenerbahçe SK	29	28.1	16	96.28 Million
3	Beşiktaş JK	27	26.4	15	87.25 Million
4	Trabzonspor	29	24.8	12	86.85 Million
5	İstanbul Başakşehir FK	32	27.8	15	65.38 Million
6	Alanyaspor	25	27.5	11	40.63 Million
7	Hatayspor	25	27.7	15	30.15 Million

8	Kasımpaşa	31	26.6	17	35.90 Million
9	Sivasspor	25	30.1	15	26.80 Million
10	Göztepe	30	26.1	12	30.83 Million
11	Gaziantep FK	29	29	16	27.18 Million
12	Çaykur Rizespor	31	28.1	20	27.63 Million
13	Fatih Karagümrük	34	27.5	20	28.35 Million
14	Antalyaspor	29	27.1	10	23.25 Million
15	Konyaspor	33	26.6	18	26.28 Million
16	Yeni Malatyaspor	30	26.5	15	19.78 Million
17	Kayserispor	33	27.6	21	19.90 Million
18	MKE Ankaragücü	35	25.4	17	20.60 Million
19	Erzurumspor	24	29.3	12	11.20 Million
20	Denizlispor	29	26.7	12	13.10 Million
21	Gençlerbirliği	30	27.4	13	11.55 Million
	Total	**618**	**27.3**	**318**	**827.88 Million**

Source: Transfermarkt, 07 May 2021

According to Table 3, we can state that the average market value is around 827.88 Million Euros with a total of 618 players from 21 teams in the Super League

Table 4. Super league pool fees 2020-21 season values

No.	Club	Share	Sports Achievement Bonus			Success Ranking Bonus	Past Championship Bonus (4,2)	Total Payment
			Win Bonus (2,7)	Draw Bonus (1,4)	Total Success Prize			
1	Beşiktaş JK	43	70.2	8.4	78.6	49	63	233.6
2	Galatasaray SK	43	70.2	8.4	78.6	37	92.4	251
3	Fenerbahçe SK	43	67.5	9.8	77.3	28	79.8	228.1
4	Trabzonspor	43	51.3	19.6	70.9	18	25.2	157.1
5	Sivasspor	43	43.2	23.8	67	9		119
6	Hatayspor	43	45.9	14	59.9	4		106.9
7	Alanyaspor	43	45.9	12.6	58.5			101.5
8	Karagümrük	43	43.2	16.8	60			103
9	Gaziantep FK	43	40.5	18.2	58.7			101.7
10	Göztepe	43	35.1	16.8	51.9			94.9
11	Konyaspor	43	32.4	19.6	52			95
12	Başakşehir	43	32.4	16.8	49.2		4.2	96.4
13	Çaykur Rizespor	43	32.4	16.8	49.2			92.2
14	Kasımpaşa	43	32.4	14	46.4			89.4
15	Y.Malatyaspor	43	27	21	48			91
16	Antalyaspor	43	24.3	23.8	48.1			91.1
17	Kayserispor	43	24.3	19.6	43.9			86.9
18	Erzurumspor	43	27	14	41			84
19	Ankaragücü	43	27	11.2	38.2			81.2
20	Gençlerbirliği	43	27	11.2	38.2			81.2
21	Denizlispor	43	16.2	14	30.2			73.2
	Total	903	815.4	330.4	1.153.50	145	264.6	2.458.40

Source: Devecioğlu, 16 May 2021; Fanatik Gazetesi, 25 May 2021; TRT Spor, 17 May 2021

4% of this season's broadcast revenue amounting to 3 billion TL in Super League is reserved for the Turkish Football Federation and 14% for the lower leagues. The remaining revenue of 2 billion 460 million is divided into 21 clubs according to paying footing and performance and past championships with 37% of the money. The total pool revenue distributed to 21 Super League clubs through the Turkish Football Federation in the 2020-21 season reached 2.458,40 Million TL.

Analysis of Turkish Super League Transfer Data with the Dimension of Globalizing Football Industry

In the globalizing football industry, the size of the losses caused by the fact that the transfers made by the clubs are not performed by considering the revenue-expenditure balance cause the financial structures of the clubs to deteriorate and they are dragged into economic instability. In this context, it is important to analyze the transfer dimension in detail by taking into account the situation of our clubs, which are in debt.

Table 5. Comparison of transfer types for 2020-2021 season

Transfer Age Range	ENGLAND	GERMANY	SPAIN	ITALY	FRANCE	PORTUGAL	RUSSIA	TURKEY
0-20 %	20	19	11	17	18	11	25	8
21-23 %	27	30	21	28	36	26	26	18
24-26 %	23	22	24	26	21	25	24	23
27-29 %	19	17	25	12	18	21	16	25
30-32 %	7	9	11	12	4	14	6	18
30+ %	4	2	8	5	4	4	4	9
Foreign Transfer %	68	58	49	61	57	45	57	71
Free Transfer %	16	26	31	20	24	38	52	68

Source: Türkiye Futbol Araştırmaları Grubu (TÜFAR), 29 May 2021

In the light of the data in Table 5, it is seen that Turkey ranks first in the percentage of foreign transfers, free transfers and transfers over the age of 30, and in the last place in transfers under the age of 23.

Table 6. Comparison of the 10-year transfer results of the big four super league clubs (Million €)

Season	Beşiktaş	Galatasaray	Fenerbahçe	Trabzonspor	Total
2011-2012	-12.68	-7.78	-7.8	-14.73	**-42.99**
2012-2013	-3.74	-28.16	-29.9	1.44	**-60.36**
2013-2014	-12.1	-43.04	-25.1	0.17	**-80.07**
2014-2015	-13.12	-11.59	5.9	-22.88	**-41.69**
2015-2016	12.95	10.76	-22.03	-0.05	**1.63**
2016-2017	-1.4	-9.86	1.4	-9.79	**-19.65**
2017-2018	21.05	-8.09	-3.32	-12.6	**-2.96**
2018-2019	8.99	2.31	-0.41	-14.07	**-3.18**
2019-2020	-14.98	-1.12	-2.14	13.6	**-4.64**
2020-2021	-1.68	3.89	3.89	-13.35	**-7.25**
Total	**-16.71**	**-92.68**	**-79.51**	**-72.26**	**-261.16**

Source: Transfermarkt, 07 May 2021

It has been concluded from the data in Table 6 that the 10-year transfer results of the four major Super League clubs are -261.16 Million Euros, and the Galatasaray club is in the first place with a balance of -92.68.

Financial Analysis of the Economic Data Belonging to the Big Four Super League Teams

The economic growth of clubs in the globalizing football industry causes them to take part in a ruthless competition cycle at the national and international level. These globalizing and industrializing economic gains have different dimensions such as sportive success, brand value, national championships, level of participation in international tournaments, revenue-expenditure balance, transfers and team value, and

matchday revenues. In this regard, analyzes to be conducted considering the situation of our clubs are important in terms of approaching the issue holistically.

Table 7. General information of big four super league teams

	Beşiktaş JK	Galatasaray SK	Fenerbahçe SK	Trabzonspor SK
Brand Value (2020)	62 Million Dollars	$ 60 Million Dollars	$ 62 Million Dollars	22 Million Dollars
Team Value (2021)	87 Million Euros	99 Million Euros	96 Million Euros	86 Million Euros
Revenues (2021)	360 Million TL	422 Million TL	484 Million TL	347 Million TL
League Championship	16	23	19	6
Turkish Cup Championship	10	18	6	9
Number of Cups in Europe		2		
Stadium Capacity	41.903	52.223	47.834	41.461
Mean Audience (2019-2020)	28.242	34.947	38.018	29.835
Occupancy Rate (2019-2020)	67%	67%	79%	73%

Source: Deloitte Sports Business Group, 03 June 2021; Transfermarkt, 07 May 2021; Türkiye Futbol Federasyonu (TFF), 03 June 2021; Kamuyu Aydınlatma Platformu (KAP) 03 June 2021; Brand Finance, 02 June 2021

As indicated in Table 7, we have determined that the other three clubs are close to each other except Trabzonspor in terms of brand value, Galatasaray is in the first place with 99 Million Euros in terms of team value, Fenerbahçe is ahead with a value of 484 million TL in revenues, the team with the highest number of championships is Galatasaray in the league (23) and in the Turkish Cup (18), it has 2 championships in European Cups, and according to the data of the 2019-2020 season, Fenerbahçe is in the first place in these lanes with an average stadium audience of 38.018 and a stadium occupancy rate of 79%.

Table 8. Summarized financial data of the big four clubs for the period 06/2020-28/02/2021 (million tl)

Club	Total Revenue	Profit/Loss	Cumulative Loss	Total Debt	Bank Loans	Financing Expense	Total Equity
Beşiktaş JK	360	-277	-1.537	3.711	2.107	-297	-1.57
Galatasaray SK	422	-3.21	-1.508	2.587	1.803	-196	-641
Fenerbahçe SK	484	-104	-1.143	3.439	2.422	-305	-904
Trabzonspor SK	347	-141	-843	1.548	938	-140	-522
Total	1.614	-843	-5.031	11.285	7.270	-937	-3.637

Source: Akşar, 02 June 2021

According to the data in Table 8, the total annual losses of the clubs were 843 million TL while the cumulative losses from the previous years reached 5.031 million TL. The bank loans of the clubs, whose total debts are 11.285 million TL, have been 7.270 million TL as of this period. The clubs made a total of 937 Million TL financing expenses as of the nine-month period in return for the loans used. As a result of the increased losses, equity turned into negative by 3.637 Million TL. While the average revenue of the four clubs was 403 Million TL, their consolidated revenues amounted to 1.614 Million TL in total and the average cumulative loss per club reached -1.258 Million TL (Akşar, 14 APRIL 2021).

Discussion and Conclusion

When we analyze the data in Table 1 taken from the last ten-year report published by Deloitte Football Money League, we see that the countries hosting the five major leagues clearly stand out in terms of the

monetary value they produce. As a matter of fact, the data in Table 2 show that the leagues of these countries (Premier League, Serie A, La Liga, Bundesliga and League 1) have a great advantage in terms of the market value provided by league organizations. In addition, it is seen from the Table 2 that the countries being in the leading position in the money league and sportive success ranking create huge values in the lower league and cup organizations as well as their main leagues and they can also support their teams in this field with a budget that they will not fall behind in the competitive order of the market. The processes in terms of national and international stock, recognition and other material value of many international league member clubs are also important in terms of providing monetary power (Vrînceanu, Horobeț, Popescu & Belaşcu, 2020).

In the study of Solbert and Gratton (2004) conducted on the data of important football teams in Europe between 1994-2000 and the study of Güngör (2014) titled "Analysis of the Relationship Between Sportive Success and Financial Performance in the Football Industry and its Application in Turkey.", they concluded that the championships of teams in the national league, participating in international football organizations and achieving success there would increase their uniform sales, advertising, sponsorship, stadium and broadcast revenues, and especially the economic income provided by organizations such as the Champions League and UEFA Cup is of great importance for the financial resources of the clubs.

It should be seen that our clubs, which are struggling with financial inadequacies, are not at a level to compete especially in UEFA organizations and if the current situation being deprived of income here continues, they will completely lose their competitive power. It is obvious that the big four clubs will want to use more public funds with the support of politics in order to maintain their superiority in the national league, especially in the structured loans. The sustainability of the existing structural and economic order should be questioned on behalf of Turkish football, as it will cause both unfair competition and an increase in foreign dependency of football clubs (Akşar, 27 November 2016).

According to the data in Table 3, the total market value of 21 teams in the Super League is around 827.88 Million Euros. We see that the big four clubs make up 45% of the total value with a value of 370 Million Euros, and the average value of the other clubs corresponds to 26 Million Euros.

In addition, when we look at the pool revenue data in Table 4, it is observed that the big four clubs have earned 37% of the total revenue with a total revenue of 870 Million TL, and the difference between the leader Beşiktaş and Denizlispor in the last place is more than 3 times. In the Premier league, which is the leader in terms of market value, this ratio is 0.3 times as much as Man. City's €163M and Sheffield United's earnings of €125M (Fanatik Gazetesi, 14 May 2021).

In the study conducted by Güngör (2014), it is stated that the increase in the budget difference between the big clubs and the others causes the competition in the leagues to decrease and as a natural result of this, the big clubs cannot achieve sports success in international organizations and the consumer fans do not enjoy football competition and this situation poses a risk for the rapidly growing Turkish football industry. The report of Cies which includes the opinions of football fans supports the data that almost four out of five fans express the opinion that the cup-winning teams are sustainable and the local leagues cannot create a competitive environment (Poli, Ravenel, & Besson, 2021), the monetary difference between the big four in the Turkish Super League and the other clubs is high and as a result, league championships are shared among these four big clubs except special cases. In addition, it has been stated in the study conducted by Depken and Globan (2021) that marginal improvements in the competitive balance achieved in the domestic league can result in a one-third win increase for UEFA League participants. It should not be overlooked that the regulations that support the balance of competition for the Turkish Super League will not only affect the local league, but also affect the success graph of our clubs in the European Leagues, thus increasing the economic gain to be obtained from this and the commercial revenues such as indirect advertising and sponsorship.

In the light of data in Table 5, we have determined that Turkey ranks first in the percentage of foreign transfers, free transfers and transfers over the age of 30, and is in the last place in transfers under the age of 23. The fact that we are in the last place in the transfers under the age of 23 especially for the country football causes us to be in the first place in the transfer market over the age of 30 as a result of the fact that our infrastructure problems in football training continue and there are not enough players from the youth setup in the market. It is necessary to state that we have achieved a rate of 71% in foreign transfers and 68% in free transfers, and the majority of our transfer foreign currency flow goes abroad and this will not benefit the country's football market. Based on the data in Table 6, it is required that the free transfer issue, which our clubs feel obliged to do, should be analyzed well by taking into account their debt- spiral situation. The inability of free transfers to hold on to the country or team they are in and the psychological pressure created by this negativity pose a great risk for our teams planning the future. In addition, we can also mention that the free transfers and rental football players carried out by the big four clubs in order to comply with the financial Fair Play criteria cause the clubs to experience deficits in their transfer budgets and to have difficulties in terms of sports success by not creating staff stability.

In this regard, if we examine the transfers and the foreign-dependent (foreign football player) situation of our system, Devecioğlu have expressed that it will be possible to train football players from the youth setup with the following statements: raising star football players is possible with the spread of the football environment in the triangle of a healthy school, family and club, talent selection, institutional club structures, infrastructure facility adequacy, coordination with physical education teachers and equipped coaches and structural reforms in which the financial resources that will provide the financing of this structure are addressed as a whole (Devecioğlu, 2020).

When Table 7 is analyzed, it has been determined that the other three clubs, excluding Trabzonspor, are close to each other in terms of brand value, Galatasaray is in the first place with a value of 99 million Euros in terms of team value, and Fenerbahçe is ahead with a value of 484 million TL in the revenue item. The dimensions reached by these data appeared in the plus numbers have created value for Turkish football and ensured the growth of the football economy market.

However, it is observed from Table 8 that the total annual losses of the clubs are 843 million TL, the cumulative losses from previous years have reached 5.031 million TL, their total debts are 11.285 million TL, bank loans are 7.270 million TL and they have paid a total of 937 Million TL of financing expenses as of the nine-month period in return for these loans. We see that as a result of increasing losses, the average revenue of the four clubs whose equities turned negative with a value of 3.637 Million TL, is 403 Million TL, their consolidated revenue total is 1.614 Million TL, the average cumulative loss per club is -1.258 Million TL, and the average debt amount per club has increased to 2.821 Million TL (Akşar, 14 April 2021).

In the study of Pınar, Nardalı, Alkibay and Girard (2017), they state that the primary way for the league and teams to gain value through branding is to create a strong league brand, and that the Turkish Super League and the teams being a strong brand together will transform the Super League into a system where a win/win strategy will be formed for all teams and all other interest groups. In the study of Havard & Dalakas (2017) titled "Understanding the marketing impacts of sports competition", they mentioned the media coverage of the phenomenon of competition in sports events and the importance given to the concept of competition while determining the marketing strategies of sports media. In the marketing phase of the Turkish Super League, knowing the importance of the media part by all interest groups and addressing the visibility of the product in the media with this awareness, paying due attention to the marketing strategies especially by media groups will increase the brand value of the product.

Turkish Super League clubs, especially the big four must realize that they can succeed by making their plans with promising and solid projects, and being a brand is actually presenting this attitude. In addition, it

is essential that the TFF (Turkish Football Federation) realizes that it is managing a brand as clubs and the league it manages, and takes protective measures against the league and clubs, and acts with current market solutions such as the transfer ceiling limit, which is also on UEFA's agenda, or the club transfer ceiling limit exceeding it.

The fact that the process of restructuring the debts of the big four clubs in the Turkish Super League is realized with the coordination of the institutions related to the directives of the political power has revealed the relationship between politics and football. We see that the autonomous structure of our football has remained so-called, it has not achieved a democratic function, and politics has not ceased to benefit from the power of football that affects the masses by leaving football in a structure that it can use for political dominance when necessary. As a matter of fact, we see from the studies in the literature that sports and politics have intertwined structures, the political and economic image of football has affected the global competitiveness throughout history, and its use on the basis of political interests has become more widespread in modern times (Şahin & İmamoğlu, 2011; Karpavicius & Jucevicius, 2009).

It is frequently addressed in the literature that the main source of the problems constituting the majority of the clubs is financial problems, the financial problems stemming from the commercial incomes are caused by the legal framework of the association and company structure, the clubs managed by the association structure have economic difficulties due to not being able to generate income, and in general this situation is caused by the existence of financial, functional and structural problems (Devecioğlu, Çoban & Yıldırım, 2003; Öğüt & Şahin, 2017; Fişek, 1998; Erturan Öğüt & İmamoğlu, 2011; State Planning Organization (DPT), 2000).

Moreover, there are many studies in the literature stating that Turkish football has structural, institutional and economic problems due to its current situation and the football organization should be reconstructed at a modern level (Devecioğlu, Çoban & Yıldırım, 2003; Sunay, 2009; Özen, Koçak, Boran, Sunay & Gedikli, 2012; Öğüt & Şahin, 2017; Ilgar & Cihan, 2019).

Suggstions

In conclusion, we are of the opinion that the debt situations created by the revenue-expenditure imbalance of football clubs in Turkey are not sustainable with the current system, these financial debt piles created by economically supported daily projects cannot be overcome, the current economic problems stem from the problems in the organizational structure of the Turkish sports system and there is a need for restructuring.

The following recommendations can be made regarding the study;

(1) The sports system should be revised and legal arrangements should be made regarding the clubs,

(2) The Clubs Law, being included in the legal regulations, should be created and implemented in a consensus environment where the contributions of the sports community from all walks of life are received, with a large and effective sports council workshop,

(3) The so-called autonomous structure of the TFF should be revised and transformed into a politically-free structure,

(4) Clubs should be freed from the structural problems created by this paradox by preventing them from being managed with both association and company status,

(5) The Premier League should be examined and the Super league should be managed as a company similar to this structure,

(6) The Clubs Association should be structurally revised, the management of the super league company to be established and the provision of brand value should be carried out with a professional management style,

(7) The pool revenue system should be made more egalitarian.

Conflict of interest

The authors declare that they have no conflict of interest.

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Investigation of the Relationship Between Teachers' Lifelong Learning Tendencies and Professional Development Self-Efficiencies

Research Article

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ABSTRACT

The aim of this study is to determine the lifelong learning tendencies and professional development self-efficacy of teachers and to reveal the relationship between lifelong learning tendency and professional development self-efficacy. The research is in correlational survey model and was carried out with 282 teachers working in secondary schools in Nevşehir province. The data in the study were obtained with the "Lifelong Learning Scale" developed by Wielkiewicz and Meuwissen (2014) and adapted into Turkish by Engin, Kör and Erbay (2017) and the "Professional Development Self-Efficacy Scale of Teachers" developed by Yenen and Kılınç (2021). As a result of the research, it was determined that teachers' lifelong learning tendencies and professional development self-efficacy perceptions were at a good level. In addition, it was determined that there was a moderately significant positive correlation between teachers' lifelong learning tendencies and their professional development self-efficacy perceptions.

Keywords:
Lifelong learning, professional development, teacher

Introduction

In today's world, the importance of education is increasing in terms of increasing the quality of the workforce and keeping up with the scientific and technological changes of societies. Because the sustainability of social development in many fields from economy to health, from agriculture and animal husbandry to industry, from culture and literature to politics is based on the knowledge infrastructure provided by education. The modern understanding of education that provides this knowledge infrastructure can only be gained with good trainers, in other words, with a professional staff of teachers (Elçiçek, 2016). Changes and developments in science and technology affect many areas of life. This area of influence pushes individuals to

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be better equipped to keep up with the changing and developing age. This situation shows that the concept of lifelong learning has ceased to be a slogan and has become a social necessity and necessity (Kaya & Önder, 2002). Laal (2011) stated that due to advances in access to information, rapid technology, global relations, industrial changes and skills requirements, the need for skill development through lifelong learning opportunities has increased. Lifelong learning encompasses all learning activities carried out with the aim of developing personal, social and professional knowledge, skills and competencies that individuals experience from birth to death (Lewis & Whitlock, 2002). Today, since education is seen as a life-long process, it is necessary to train teachers with some educational activities to be organized by relevant institutions and also to develop themselves (Taymaz, 2005).

Fullan and Hargreaves (1996) stated that lifelong learning teachers are academically successful and that while teachers develop themselves personally, their students can also improve. In today's world, where future generations gain importance for societies, teachers should also constantly worry about updating and improving themselves and how they can be more beneficial to students (Çelikten, Şanal & Yeni, 2005). The necessity of teachers to be individuals who are open to change and development and who are lifelong learners is emphasized in the literature. The common denominator of these points is seen as adopting and realizing life-long development and guiding students in this sense (Budak, 2009). Studies have shown that when teachers have a development-oriented mindset, their students are educated in a more effective learning environment (Leroy et al., 2007).

One of the main factors affecting the quality of education is the professional development of teachers. The developments in the field of education, the changing needs of the society, the developments in the technological field, the change in the student profile and the changing new paradigms based on education in the 21st century are among the main reasons for the professional development needs of teachers (Odabaşı & Kabakçı, 2007). The quality of the teacher is primarily related to the quality of the teacher at the beginning of the profession and the competence in his service, as well as his professional development that enables him to develop his knowledge and skills according to the requirements of the age (Hamdan & Lai, 2015; Özer, 2005). In this context, considering today's needs, professional development is a life-long process and it is necessary to accept lifelong learning as a skill that should be acquired by teachers.

Many researches are carried out in the country and abroad regarding the professional development self-efficacy of teachers and lifelong learning. When the literature is examined, there are not many studies examining the relationship between teachers' lifelong learning tendencies and professional development self-efficacy in Turkey. Therefore, it is thought that the results of this research will contribute to the literature in terms of developing professional development self-efficacy in teachers, understanding the importance of lifelong learning, and seeing the relationship between them. The aim of this study is to determine the lifelong learning tendencies and professional development self-efficacy of teachers and to reveal the relationship between lifelong learning tendency and professional development self-efficacy. For this purpose, the following sub-objectives have been determined.

- What is the lifelong learning tendency level of teachers?
- What is the professional development self-efficacy level of teachers?
- Is there a relationship between teachers' lifelong learning tendencies and professional development self-efficacy?

Methodology

Research Model

In this study, it was aimed to determine teachers' lifelong learning tendencies and professional development self-efficacy and to reveal the relationship between them. For this purpose correlational survey

model, one of the survey models, was used as a research design to reveal the current situation. "Correlational survey models aim to determine the existence and degree of co-variance between two or more variables" (Karasar, 2012).

Study Group

The study group of the research consists of teachers working in secondary schools in Nevşehir province in the 2022-2023 academic year. While choosing the study group, convenient sampling was used to form the sample group, considering that it would be easily accessible in terms of time, labor or cost. 282 teachers working in secondary schools in Nevşehir city center participated in the research. Personal characteristics of the teachers participating in the research are given in Table 1.

Table 1. Demographic information of the participants

Gender	**f**	**%**
female	159	56.4
male	123	43.6
Professional Experience		
0-10 years	94	33.3
11-20 years	132	46.8
21 years and more	56	19.9
Educational Degree		
bachelor's degree	222	78.7
graduate	60	21.3
Total	**282**	**100**

When Table 1 is examined, it is seen that 159 (56.4%) of the teachers constituting the study group are female and 123 (43.6%) are male. 94 (33.3%) of the teachers have 0-10, 132 (46.8%) 11-20 and 56 (19.9%) of them have 21 years or more experience. 222 (78.7%) of the teachers are have bachelor's degree and 60 (21.3%) graduates degree.

Data Collection Tools

In the research, "Lifelong learning scale" consisting of 15 items in 5-point Likert type, developed by Wielkiewicz and Meuwissen in 2014 and adapted to Turkish by Engin, Kör and Erbay (2017) was used to determine the lifelong learning tendency of teachers. As a result of the analyzes made, the Cronbach Alpha reliability value for the whole scale was calculated as .92, the Spearman-Brown correlation value as .87 and the Guttman split-half value as .87. In addition, to determine the professional development self-efficacy of teachers, the "Professional Development Self-Efficacy Scale of Teachers" consisting of 20 items and four factors in 5-point Likert type developed by Yenen and Kılınç (2021) was used. As a result of the analyzes made, the Cronbach Alpha reliability value for the whole scale was calculated as .90, the Spearman-Brown correlation value as .92 and the Guttman split-half value as .91. This study was approved by the Nevşehir Hacı Bektaş Veli University Ethics Committee with its decision dated 20.09.2022 and numbered 2022.10.294.

Analysis of Data

The data obtained from the research were analysed with the statistical package program. Frequency and percentage values of data on demographic information of teachers were calculated. Arithmetic mean and standard deviation values from descriptive statistical techniques were used to determine professional development self-efficacy and lifelong learning tendencies. Pearson product-moment correlation coefficient analysis was used to examine the relationship between lifelong learning tendencies and professional development self-efficacy. The correlation relationship was interpreted by considering the intervals determined by Büyüköztürk (2018) (1.00-0.71-high; 0.70-0.31-medium; 0.30-0.00-low). In the scale, to

determine the level of scale of each code, completely agree (5), agree (4) partially agree (3), disagree (2), completely disagree (1) grades were used. In the interpretation of arithmetical mean the average value between 1.00-5.00: is for "completely agree": 4.21-5.00; "agree": 3.41-4.20; "partially agree": 2.61-3.40; "disagree": 1.81-2.60; "completely disagree" 1.00-1.80. The significance level was evaluated as 0.05.

Findings

In this research, firstly, descriptive analysis was conducted to determine teachers' lifelong learning tendencies and professional development self-efficacy levels. The arithmetic mean and standard deviation values of teachers' lifelong learning tendencies are given in the table below.

Table 2. Arithmetic mean and standard deviation values of teachers' lifelong learning tendencies

Lifelong Learning	$\overline{X}$	**sd**
I read to learn something new.	4.17	0.74
I share what I have learned with others	4.30	0.70
I like to analyse problems and issues in depth.	4.14	0.84
I see myself as a life-long learner.	4.38	0.70
Reading is among my regular activities.	3.95	0.88
Writing is among my regular activities.	3.15	1.08
I am a self-motivated learner	4.00	0.86
I wander through libraries and bookshops to find interesting books and magazines	3.56	1.08
I make interesting contributions to discussions in the classroom, at work, or in conversations with friends.	3.81	0.85
My activities involve critical thinking.	3.79	0.87
I read for fun and entertainment.	4.17	0.75
I am a person who is curious about many things.	4.39	0.66
My interests in learning are very broad.	4.16	0.86
I like to learn new things.	4.52	0.65
I read a lot of things that are not necessary in class or in my job.	3.77	1.19
Total	4.02	0.58

When the opinions of the teachers in Table 2 regarding the lifelong learning tendencies are examined, the highest level of opinion is; “I like to learn new things” ($\overline{X}$= 4.52), “I am curious about many things” ($\overline{X}$= 4.39), “I consider myself a life-long learner” ($\overline{X}$= 4.38), and “I share what I have learned with others” ($\overline{X}$= 4.30) stated the items. They expressed an opinion at the level of "completely agree" with these items. The lowest stated the items "I wander around the libraries and book stores to find interesting books and magazines" ($\overline{X}$= 3.56) and "Writing comes among my regular activities" ($\overline{X}$= 3.15). When the total arithmetic mean of the teachers regarding their lifelong learning tendencies is examined, it is seen that they express their opinions at the level of "agree" ($\overline{X}$= 4.02) (high level). According to this result, it can be stated that teachers have a high level of lifelong learning tendencies and they consider themselves sufficient in this regard. The arithmetic mean and standard deviation values of teachers' professional development self-efficacy sub-dimensions are given in Table 3.

Table 3. Arithmetic mean and standard deviation values for professional development self-efficacy

	Professional Development	$\overline{X}$	**sd**
Self-improvement	I feel competent in planning my work life and time management.	3.98	0.86
	I need to improve my anger management and stress coping skills.	2.78	1.31
	I can communicate effectively with my students and colleagues.	4.41	0.70
	I participate in cultural and artistic activities to develop my personal and professional sensitivities.	3.98	0.81

	I think that I should have knowledge about verbal and nonverbal communication skills.	2.65	1.11
	Self-improvement Total	3.65	0.51
Instructional Development	I can use information and communication technologies for teaching purposes.	4.47	0.48
	I feel the need to improve myself in preparing suitable learning environments.	2.04	0.81
	I am successful in teaching environment and classroom preparation activities.	4.14	0.58
	I feel competent in applying different teaching methods and techniques.	4.01	0.71
	I have sufficient knowledge about designing and using instructional materials	3.93	0.86
	I can develop and use appropriate and different measurement tools to evaluate learning outcomes.	3.89	0.93
	Instructional Development Total	3.75	0.49
Field Development	I need information on how to take part in national and international projects and events related to the field I work in.	4.27	0.72
	I have sufficient knowledge about research methods related to my field.	2.27	1.06
	I follow scientific publications related to my field.	3.85	0.84
	I can use information technologies for scientific research	3.93	0.79
	Field Development Total	3.58	0.51
Institutional Development	I have sufficient knowledge about the institutional structure and operation.	3.81	0.92
	I feel the need to improve myself about teamwork activities for the needs of the school.	3.94	0.85
	I have the courage to take on responsible school-related tasks.	4.18	0.74
	I can take responsibility for solving the problems of the school and my colleagues.	4.29	0.77
	I can contribute in taking the necessary measures to contribute to the development and improvement of the school.	2.71	1.29
	Institutional Development Total	3.79	0.57
	Professional Development Self-Efficacy Total	3.87	0.43

When the opinions of the teachers in Table 3 on their professional development self-efficacy are examined, the highest level of opinion of the teachers in the sub-dimension of self-improvement is; "I can communicate effectively with my students and colleagues" ($\overline{X}$= 4.41), "I feel competent in planning my work life and time management" ($\overline{X}$= 3.98) and "I participate in cultural and artistic activities to improve my personal and professional sensitivities" ($\overline{X}$= 3.98) stated their items. The lowest were stated in the items "I need to improve my anger control and coping with stress skills" ($\overline{X}$=2.78) and "I think I should have information about verbal and nonverbal communication skills" ($\overline{X}$=2.65). When the total arithmetic mean of personal development self-efficacy belief is examined, it is seen that teachers express their opinions at the level of "agree" ($\overline{X}$= 3.65) (high level). According to this result, it can be said that teachers' personal development self-efficacy beliefs are at a high level and they see themselves as sufficient in self-improvement.

The highest level of opinion of teachers in the instructional development sub-dimension; "I can use information and communication technologies for teaching purposes" ($\overline{X}$= 4.47), "I am successful in teaching environment and classroom preparation activities" ($\overline{X}$= 4.14) and "I feel competent in applying different teaching methods and techniques" stated their items. The lowest were stated in the items "I have sufficient knowledge about designing and using instructional materials" ($\overline{X}$= 3.93) "I can develop and use appropriate and different measurement tools to evaluate learning outcomes" ($\overline{X}$= 3.89), and "I feel the need to improve myself in preparing suitable learning environments" ($\overline{X}$= 2.04). When the total arithmetic mean regarding the instructional development self-efficacy belief is examined, it is seen that the teachers expressed their opinions at the level of "agree" ($\overline{X}$= 3.75) (high level). According to this result, it can be said that teachers' instructional development self-efficacy beliefs are at a high level and they see themselves as sufficient in instructional development.

The highest level of opinion of teachers in the sub-dimension of field development; “I need information on how to take part in national and international projects and events related to the field I work in” ($\bar{X}$= 4.27), “I can use information technologies for scientific research” ($\bar{X}$= 3.93), and "I follow scientific publications related to my field" ($\bar{X}$= 3.85) stated their items. The lowest was stated in the item "I have sufficient knowledge about research methods related to my field" ($\bar{X}$= 3.93). When the total arithmetic mean regarding the spatial development self-efficacy belief is examined, it is seen that the teachers expressed their opinions at the level of "agree" ($\bar{X}$= 3.58) (high level). According to this result, it can be said that teachers consider themselves sufficient in terms of field development.

In the institutional development sub-dimension, the highest level of teachers' opinion; “I can take responsibility for solving the problems of the school and my colleagues” ($\bar{X}$= 4.29), “I have the courage to undertake school-related tasks that require responsibility” ($\bar{X}$= 4.18) “I feel the need to improve myself about teamwork activities for the needs of the school” ($\bar{X}$= 3.94), and “I have sufficient information about the institutional structure and functioning” ($\bar{X}$= 3.81) stated their items. The lowest was stated in the item "I can contribute to the development and improvement of the school in taking the necessary measures" ($\bar{X}$= 2.71). When the total arithmetic mean of organizational development self-efficacy belief is examined, it is seen that the teachers expressed their opinions at the level of "agree" ($\bar{X}$= 3.79) (high level). According to this result, it can be said that teachers' institutional development self-efficacy beliefs are at a good level and they see themselves as sufficient in institutional development.

When the total arithmetic mean of professional development self-efficacy belief is examined, It was determined that teachers expressed their opinions at the level of "agree" ($\bar{X}$= 3.87) (high level). Accordingly, it can be said that the teachers participating in the research have a good level of professional development self-efficacy beliefs and consider themselves competent in professional development. The results of Pearson product-moment correlation analysis performed to reveal the relationship between teachers' professional development self-efficacy and lifelong learning tendencies are given in Table 4.

Table 4. Correlation analysis of the relationship between teachers' lifelong learning tendencies and professional development self-efficacy

	1	2	3	4	5
Lifelong Learning	-				
Professional Development	.560*	-			
self-improvement	.342*	.564*	-		
instructional Development	.443*	.844*	.369*	-	
field Development	.451*	.847*	.485*	.734*	-
institutional Development	.443*	.857*	.559*	.572*	.674*

p < .05 *

When Table 3 is examined, it has been determined that there is a moderately significant positive correlation between teachers' lifelong learning tendencies and professional development self-efficacy (r = .560, p<.05). Similarly, teachers' lifelong learning tendencies and professional development self-efficacy sub-dimensions are self-improvement (r = .342, p<.05), instructional development (r = .443, p<.05), field development (r = .451). , p<.05) and institutional development (r = .443, p<.05) sub-dimensions were found to be positively moderately significant.

Conclusion and Discussion

In this study, it was aimed to determine the relationship between teachers' lifelong learning tendencies, professional development self-efficacy beliefs, lifelong learning tendencies and professional development.

According to the results of the research, it has been concluded that teachers have a high level of lifelong learning tendencies and they consider themselves sufficient in this regard. In some studies, it has been found that teachers have a high level of lifelong learning tendencies, which supports our research result. (Ayaz, 2016; Ayra, 2015; Erdamar et al., 2017; Kazu & Erten, 2016; Özçiftçi, 2014; Şahin & Arcagök, 2014; Yaman, 2014). Today, in order for individuals to continue their lifelong learning, learning environments should be arranged accordingly and teachers working in these learning environments should make lifelong learning a philosophy of life. Teachers are of great importance in lifelong learning (Demirel, 2009). The fact that teachers have a high tendency towards lifelong learning shows that the teachers participating in the research are willing to improve themselves and are curious about learning. It is important for teachers to be in a lifelong learning trend for both personal and professional development and to maintain this throughout their lives. The high level of lifelong learning tendencies of teachers, who will provide students with the basic knowledge and skills related to lifelong learning, may contribute to the increase of lifelong learning tendencies and skills of the students they train and will also contribute to the spread of this habit in the society (Ayra, 2015).

According to the results of the research, it was determined that teachers' professional development self-efficacy scale sub-dimensions of self-improvement, instructional development, field development and institutional development self-efficacy beliefs were at high levels and they considered themselves competent in these subjects. In some studies conducted in the literature, it has been concluded that teachers' professional efficacy beliefs are at a high level supporting our research result (Aksoy, 2011, Ayra, 2015; Benzer, 2011; Çimen, 2007; Doğan, 2013; Gençtürk, 2008; Göçmen, 2014; Kasap, 2012; Korkut, 2009; Özata, 2007). Hoy and Woolfolk (1993; cited by Zengin, 2003) stated that people with a low sense of efficacy in achieving a job show avoidance behavior, while those who feel competent work harder and strive for longer than those who feel inadequate when faced with difficulties. The ability of teachers to fulfill the competencies required by the profession is closely related to their belief that they can fulfill their duties and responsibilities as well as receiving a good education (Yılmaz et al., 2004). It has been determined that teachers with high self-efficacy beliefs do not give up on their goals in the face of failure, are flexible when applying education programs, apply new teaching methods and approaches, therefore they get better results in terms of student success and motivate their students to learn better (Gibbs, 2002). Özata (2007) stated that teachers with high professional self-efficacy beliefs will look more favorably towards innovation and change, while teachers who see themselves as inadequate will have a negative view and resist change. In this context, it can be said that the level of professional development self-efficacy belief is one of the important factors affecting the success of teachers.

Another finding obtained as a result of the research is that there is a significant relationship between teachers' lifelong learning tendencies and their professional development self-efficacy. As a result of the analysis of the data obtained from the scales, it was concluded that there is a positive and moderate relationship between teachers' lifelong learning tendencies and their teaching professional development self-efficacy. Accordingly, it was concluded that as the lifelong learning tendencies of the teachers within the scope of the research increased, their professional development also increased. In some studies conducted, results supporting our research results were obtained (Akpınar, 2020; Ayra, 2015; Özçiftçi, 2014; Selvi, 2011; Şen, 2021). In the study conducted by Ayra (2015), it was determined that there is a positive and significant relationship between lifelong learning tendencies and professional self-efficacy beliefs. As a result of the research conducted by Özçiftçi (2014), it was seen that there is a positive and significant relationship between teachers' lifelong learning tendencies and their self-efficacy. Similarly, in the study conducted by Selvi (2011), it was emphasized that there is a significant relationship between the two variables and that lifelong learning competencies are required to be a qualified teacher. Therefore, it has been determined that this result in the research is consistent with the results of other studies in the literature. As a result, it can be said that if teachers' lifelong learning tendencies increase, their professional development self-efficacy will also increase.

Ethics Committee Approval:

This study was approved by the Nevşehir Hacı Bektaş Veli University Ethics Committee with its decision dated 20.09.2022 and numbered 2022.10.294.

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Investigation of Pre-service Mathematics Teachers' Awareness of Mathematical Connections

Research Article

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ABSTRACT

This study aims to determine what pre-service teachers know about on connections skill in mathematics teaching before starting teaching, to understand for what purpose and how connections are made, and to examine changes in their views on why this skill is important in the education process. Drawing on the case study research design, one of the qualitative research methods, this study was performed with a total of 40 junior-level pre-service mathematics teachers (20 female and 20 male) that pursue their education in a public university in Turkey. An interview form with two questions was used to collect data. The data were analyzed through content analysis method. The preliminary interview conducted in this study revealed that 4 of the pre-service teachers did not have any knowledge on mathematical connections at the beginning of this study, and that those who successfully made connections had a low level of awareness. At the end of this course on connections in mathematics teaching offered, all pre-service teachers prepared assignments where they presented different types of connections across various learning outcomes. The knowledge, skills and awareness of the pre-service teachers on mathematical connections increased, as observed in the last interview performed.

Keywords:
Connections in mathematics teaching, connections skill, pre-service mathematics teachers

Introduction

Teaching of mathematics benefits from certain connections to support students' reasoning and problem-solving skills, to concretize abstract concepts, and to strengthen their understanding. The NCTM [National Council of Teachers of Mathematics] (2000) process standards presents the following indicators that are must-haves for connections skills:

- To recognize and use connections among mathematical ideas,

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• To understand how mathematical ideas interconnect and build on one another to produce a coherent whole,

• To recognize and apply mathematics in contexts outside of mathematics (Van De Walle, Karp, & Bay-Williams, 2014).

Considering these indicators, it seems that the main goal here is to give students the ability to access information by making research, establishing relationships, reasoning, instead of directly conveying information to them.Discussion on the connections skills in mathematics teaching in the literature falls under mainly four categories. These categories are making connections with real world, making connections between different representations, making connections between concepts, and making connections with different disciplines (Flores, 1992; Schwalbach & Dosemagen, 2000; Mosvold, 2008; Hough, O'Rode, Terman & Weissglass, 2007; Hilbert & Renkl, 2008; Doruk & Umay, 2011; Osman, Hiong & Vebrianto, 2013; Bingölbali & Coşkun, 2016; Özgen, 2016). There are several approaches that consider only three categories in the classification of mathematical connections (connections with real world, connections with different disciplines and connections within mathematics) (Coxford, 1995; Eli, 2009; Lockwood, 2011).

The first of these categories is making connections with "real world." Pepin & Haggarty (2001) emphasized the importance of making connections with real world during lessons, and stated that it is possible through connections with real world to ensure permanent and effective learning. They further reported that such connections allow students to apply what they have theoretically learned in real-life problems. However, according to Gainsbourg (2008), as the situations that an individual will encounter in real life may be limited, real-life connections should be treated as situations that are encountered or are likely to be encountered, in this process of making connections. The second of these categories is making connections "between different representations." Making connections between different representations through transitions and transformations, for example, using diagrams, graphs, tables and symbols to express mathematical ideas and connections, enables students to understand and retain what they understand (Van De Walle, Karp, & Bay-Williams, 2014). The third category is making connections "between concepts." Mathematical concepts, operations and transitions between them are key in the connections between concepts. Conceptual, procedural knowledge includes transformations and relations between them (Bingölbali, Coşkun, 2016). The last category is making connections "between different disciplines." This includes the connections of mathematical concepts with different disciplines (Furner & Kumar, 2007; Osman, Hiong, & Vebrianto, 2013). Coxford (1995) defined connection as "a very broad set of ideas and processes ide range of ideas and processes that can be used to link different topics in mathematics."

Different studies show that different connections used by teachers in mathematics teaching support students to have deeper meanings about concepts (Hiebert & Carpenter, 1992; Duval, 1999). Research on teachers have focused on their mathematical connection skills and information, whether they make connections in the classroom environment and how they make these connections. Coşkun (2013) sought to determine to what extent and how teachers include connection in their classroom practices in mathematics lessons. The researcher concluded that teachers mostly benefit from connections between concepts and real world, less prefer connections between different representations, and hardly make connections with other disciplines in their classroom practices. From the point of view of pre-service teachers, it is reported that unless pre-service teachers recognize the importance of making different connections and of connections skills in mathematics teaching, they may be insufficient to support their problem-solving skills of students when they become teachers (Eli, Mohr-Schroeder & Lee, 2011). In this regard, one thing is notable that teachers who are new in teaching make connections at a level that can be called minimal, and that even if they make some connections, they are not aware of them (Bartels, 1995).

In this study, the primary aim was to investigate the level of knowledge of pre-service teachers about what the connections skill means, for what purpose and how mathematical connections can be made, before the lesson on mathematical connections. After the studies, activities and assignments within the scope of the mathematical connections course, the second aim of the research was determined as how the pre-service teachers developed in terms of their knowledge, purpose and way of making connections (how).

With these two aims determined in the research, it was aimed to raise the awareness of pre-service teachers about the use of these features of mathematics, which is related to many disciplines, related to different subjects in itself, used actively in daily life and can be represented with different representations.

1) What do the pre-service mathematics teachers think about mathematical connections prior to this study?

2) What do the pre-service mathematics teachers think about mathematical connections after this study?

Methodology

Research Design

The aim of this study is to reveal the knowledge of pre-service mathematics teachers about what mathematical connections is, for what purpose and how to do it before and after the mathematical connections lesson, and thus the change in their knowledge.

For this reason, the research design of this study is the case study design, one of the qualitative research methods. The illustrative case studying is used to give information about a case (Dawey, 2009).

Participants

The participants of this study are 40 pre-service teachers (20 female and 20 male) who are junior-level students at the faculty of education in a public university in Turkey. The reason for selecting the participants from junior-level students is that the research data would be collected during the course titled "connections in mathematics teaching." Therefore, the pre-service teachers participating in this study were selected through purposive sampling method. Only those who were willing to take part in were included in the sample.

Data Collection Tool

An interview form was used to collect data for this study. This interview form consists of two questions. The interview questions were designed considering the literature; consequently, two questions were formed to reveal what pre-service teachers know about mathematical connection, how and on what subjects they make connections. These questions were evaluated by a linguist in terms of Turkish language use. The questions were then revised based on the feedback given, and to perform a pilot study, these questions were asked to five pre-service teachers who are junior-level students in another university. After the pilot interviews, the questions were finalized. The final version of these questions are as follows:

1) What does mathematical connection mean?

2) How and for what purpose do you use mathematical connections in mathematics teaching?

Prior to the interviews, the researcher made sure that each pre-service teacher was willing to participate and stated that the interview would be audio-recorded. The researcher further articulated that the interviews should not be considered like a test of any kind as they only intended to reveal what they think about the subject. These interviews were individual interviews that lasted about 20 minutes for each pre-service teacher. The questions were presented in the same order for each pre-service teacher.

Research Plan and Process

Prior to the mathematical connection course, preliminary interviews were conducted with the participants. Following that, they were given 5 weeks of education on the mathematical connection process. During this training, different connections skills were introduced and various examples were presented. The educational content offered to the pre-service teachers and the examples of mathematics connections presented were determined considering the studies by Özgeldi & Osmanoğlu (2017), İncikabı (2017) and Özgen (2017). The pre-service teachers were also given assignments related to mathematical connections. These assignments required them to make mathematical connections for the grade level, learning area and achievements that they would determine themselves in the curriculum for mathematics course given at the secondary school level in Turkey. Below are some of the examples provided by the pre-service teachers.

1.Example of Assignments

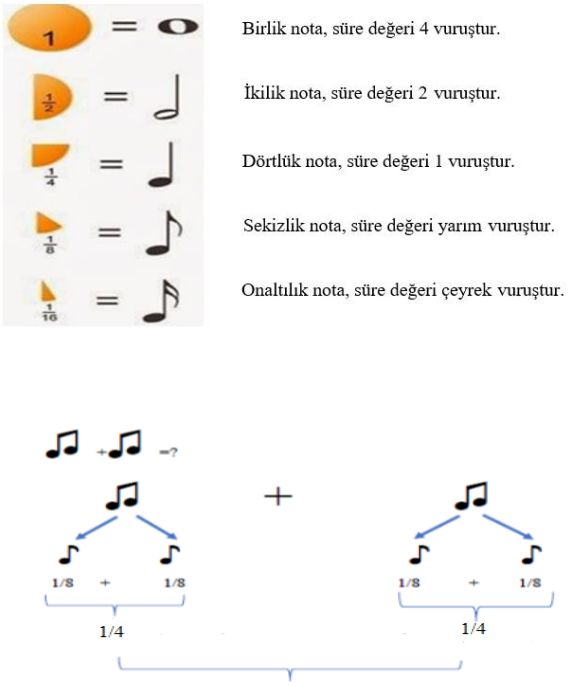


Figure 1. Example of Connecting Mathematics with Different Disciplines

2.Example of Assignments

- ✓ (For the first picture) The picture given shows four different inclines and four people who have climbed these inclines. Which incline do you think was more difficult to climb? Why?
- ✓ (For the second picture) Do you think one would encounter an incline while walking straight? Is it easy or difficult to walk on a stable flat ground?
- ✓ (For the third picture) You can see inclines in 5 different colors and the drawing of a graph illustrated for these inclines. Where in the drawing is the incline greater?

Figure 2. Example of Connecting Mathematics with Real Life

Figure 2 shows the assignment of a pre-service teacher who used the following 8th grade achievement: "The student can successfully explain the incline of a line with models, and relate linear equations and graphs to incline." It seems that the teacher has constructed models on the subject of the incline of a line with situations that can be encountered in daily life, and attempted to establish connections by asking thought-provoking questions over these models.

3.**Example of Assignments**

✓ As in the figures given below, when the containers fill with water, what would be the relationship between time and the volume of water in the containers?

✓ In these two observations, through which you are asked to examine the relationship between time and volume, which of the quantities is the dependent variable and which is the independent variable?

✓ Although the rate of change of both of these relationships is the same, why are their equations different?

✓ Please draw a graph of the resulting two equations.

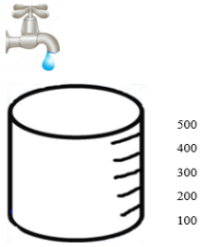
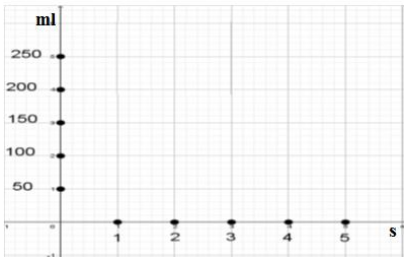
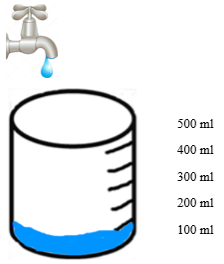
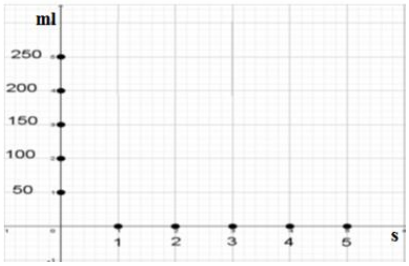
	Time (s) Volume (ml) 0 0	 Change of Water in an Empty Container by Time
	Time (s) Volume (ml) 0 100	 Change of Water in a Full Container by Time

Figure 3. Example of Connecting Mathematics with Different Representations

As you can see in Figure 3, the assignment of the pre-service teachers is related to the 8th grade achievement that reads "the student can successfully draw a graph of linear equations." This assignment seeks to establish connections through different representations, such as tables and graphs, on the subject of drawing a graph of linear equations. Further, it requires one to consider a graph and table starting from zero and starting from a value different than zero.

4. Example of Assignments

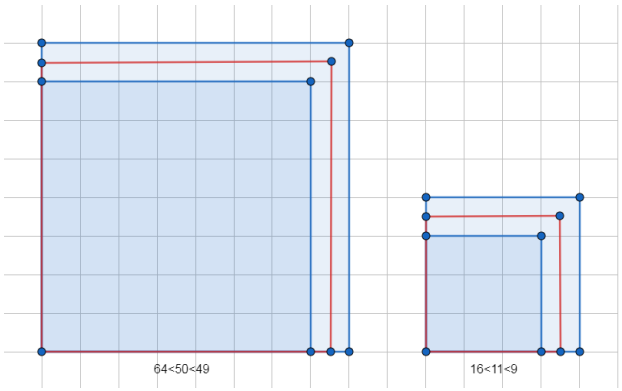
<table>
<tr>
<td> 
</td>
<td>✓ Calculate the areas of the shapes given in the form of a square on the left.
✓ Please explain the relationship of these areas with each other.
✓ Considering Figure 1, can you establish a relationship between the numbers √50, 8 and 7?
✓ Consequently, √50 is between which two integers?
✓ Considering Figure 1, can you establish a relationship between the numbers √11, 3 and 4?
✓ Consequently, √11 is between which two integers?</td>
</tr>
<tr>
<td colspan="2">Once the student conceptually grasps the content of the achievement intended through these questions, the following question may be asked to test knowledge on the related operations:</td>
</tr>
<tr>
<td></td>
<td>(The figures in the picture refer to the length of the runway in meters)
Carl Fredricksen (grandfather), Russell (child) and their dog Bob Peterson decide to run a competition. Accordingly, please answer the following questions:
1. Given that Bob Peterson has traveled √20m, at what point is he now?
2. Given that Russell has traveled √11m, at what point did he last pass?
3. Given that Carl F. has traveled √28m, at what range is he now?</td>
</tr>
</table>

Figure 4. Example of Connecting Mathematics Conceptually and Operationally

As you can see in Figure 4, the assignment of the pre-service teachers is related to the 8th grade achievement that reads "the student can successfully determine between which two natural numbers a square root number that is not a perfect square lies." This assignment makes both conceptual and operational connections on the subject of determining between which two natural numbers a square root number that is not a perfect square lies. First, the concept of "square root" is introduced through the use of a square with three different side lengths to calculate the range of the numbers; then, operations related to "square root" are performed through the numbers and letters in the question. These two questions seek to make conceptual and operational connections on square root numbers.

Following the submission of the assignments by the pre-service teachers, the final interviews were carried out. The questions asked in the final interviews were the same as in the preliminary interviews.

Data Analysis

The content analysis technique was used to analyze the collected data. The analysis was carried out in stages. In the first stage, the data obtained as audio recording during the preliminary interviews were analyzed

and later checked by a person other than the researcher. The data were then coded by the researcher. Also, the data were analyzed by a different researcher outside the research team, and 88% agreement was ascertained between the identified codes. For the codes not agreed upon, the data and codes were reviewed again; then, the codes were revised considering the consensus reached between the researchers. A similar process was applied to the final interviews. In the analysis of the final interviews, 89% agreement was found with the other researcher.

To improve the internal validity of this study, the literature was taken into account when designing the interview questions. The agreement of the codes with the themes emerged from the data was reviewed to ensure integrity. For the pre-service teachers to be able to express their opinions easily without any concerns, information was provided by the researcher about the content of the research and the teachers were told that the interviews are not a test of any kind, prior to the interviews. In this way, it was ensured that the data to be collected during the interviews would represent the reality as much as possible. To further improve internal reliability, the findings are presented without interpretation. After the coding on the data were made by the researcher, a different researcher was also allowed to perform coding, and the resulting codes together were together reviewed to calculate the percentage of agreement. To support the external reliability of this research, the data that underlie this research have been stored by the researcher to allow them to be validated and re-used in the future.

Findings

Views of the Pre-Service Teachers on Mathematical Connections Prior to the Course

Interviews were conducted to reveal what the pre-service teachers know about the mathematical connections process in mathematics teaching and to determine the challenges they encounter in this regard, if any. Table 1 presents the findings for the question "What does mathematical connections mean?" asked in the individual interviews.

Table 1. Definitions of mathematical connections made by the pre-service teachers

What does mathematical connections mean?	*Frequency (%)*
It is to relate some situations in real life with mathematics.	22 (55%)
It is to make connections between operations.	14 (35%)
I've never heard of it; I don't know.	4 (10%)
Total	40 (100%)

Table 1 indicates that more than half of the pre-service teachers (55%) define mathematical connections as making connections with real life. A striking finding is that 4 of the pre-service teachers (10%) stated that they had never heard of this subject and did not know it, even though they will graduate next year. Also, 14 pre-service teachers defined mathematical connections as operations and numbers. One of these pre-service teachers stated:

"Think about it like this, repeated addition is actually a multiplication; repeated subtraction is a division. So, there is a relationship between operations. This is actually a mathematical connection…"

The second question asked following this one that reads "How and for what purpose do you use mathematical connections in mathematics teaching?" was left unanswered by the pre-service teachers who did not provide any answer on what mathematical connections is or stated that they did not know what it is. Table 2 presents the answers given to this question under different categories.

Table 2. Answers of the Pre-service Teachers on How and for What Purpose They Use Mathematical Connections

How do you use mathematical connection?	*For what purpose do you use this connection?*	*Frequency*
In all subjects related to "real life" situations in mathematics course (connections with real life)	To make mathematics easier and comprehensible.	10 (25%)
	To reduce math anxiety.	9 (22%)
	To show that mathematics is omnipresent.	3 (8%)
In situations involving the transition from one operation to another (connections with operations)	To teach the order of operations in problems.	8 (20%)
	To demonstrate that each operation is relatable to each other (repeated addition= multiplication, repeated subtraction=division)	6 (15%)
No answer; I have no idea.		4 (10%)
Total		40 (100%)

A remarkable finding in Table 2 is that the participants divided over the purpose of mathematical connections. More specifically, while 55% of the participants reported that they use mathematical connections "to make mathematics easier, to reduce math anxiety and concerns, to show that mathematics underlies the universe, under the heading of connections with real life", 35% of them stated that they aimed "to teach mathematics traditionally based on only numbers and operations, under the heading of connections with operations." Some of the statements of these pre-service teachers in two different groups are as follows:

"I can use mathematical connections in all situations in real life. Students are afraid of mathematics and find it difficult; I think we need to establish a connection with real life to eliminate such fear and concerns…"

"Mathematics operation, mathematics number... mathematical connection should relate to operations. We need to use this connection, for example, to teach students the order of operations…"

Based on the findings in Table 1 and Table 2, it seems that the pre-service teachers do not know and cannot exemplify different types of mathematical connections. Moreover, the purposes of using different types of mathematical connections they specified were limited.

Views of the Pre-Service Teachers on Mathematical Connection After the Course

Following the course and the submission of the assignments, the pre-service teachers were asked the questions of "What does mathematical connection mean?" and "How and for what purpose do you use mathematical connection?" once again. Then, regarding the efficiency of the course given, they were asked "How do you find the course on mathematical connection you attended? How would you describe this course?" All of the pre-service teachers, 40 in total, referred to the types and features of connections in mathematics teaching in their answers to the question of "What does mathematical connection mean?" Including the four pre-service teachers who stated that they had never heard this concept before, as can be seen in Table 1, all of the pre-service teachers reported that mathematics can be connected with daily life, different disciplines, different representation forms, conceptually and operationally, which can be understood from Table 3. As for the second question, it is remarkable that the purpose of making mathematical connections was no longer to teach the order of operations in problems; Table 4 clearly indicates that this has been replaced by to make mathematics subjects comprehensible and to indicate that mathematics is omnipresent in every area of life.

Table 3. Definitions of mathematical connection made by the pre-service teachers after the course

What does mathematical connections mean?	*Frequency (%)*
It is to connect mathematics with everyday life, different disciplines and forms of representation, both conceptually and operationally.	40 (100%)
Total	40 (100%)

Table 4. Answers of the Pre-service Teachers on How and for What Purpose They Use Mathematical Connections After the Course

How do you use mathematical connections?	*For what purpose do you use this connections?*	*Frequency*
In all subjects related to "real life" situations in mathematics course (connections with real life)	To make mathematics easier and comprehensible.	15 (37.5%)
	To reduce math anxiety.	12 (30%)
	To show that mathematics is omnipresent.	5 (12.5%)
In other courses	To show that mathematics is present in other courses and to help students love math	5 (12.5%)
Making connections within mathematics/between representations	To ensure a better conceptual understanding of mathematics	3 (7.5%)
Total		40 (100%)

Some of the answers of the pre-service teachers regarding Table 3 and Table 4 are as follows:

"Attending the training on mathematical connections has given me a lot; I didn't have any knowledge about the subject before, but now I feel very equipped... (T3)"

"I used to connect mathematics only with daily life; my discourse always focused on that. Through this training, I found out that I could not even relate mathematics to daily life and learned how to do that... (T22)."

"When it comes to mathematical connections, the thing that occurred to me was always numbers, numbers-operations, and the order of operations, and so forth... But, upon attending this education, I learned that connections are something else... (T17)"

"As a matter of fact, mathematics is present in all courses. I understood this better through this connections training. Through connection, we can make a student who dislikes mathematics, but likes other subjects such as biology and physics like mathematics (T34)."

"Having participated in this training, I will use different types of mathematical connections to make my students love mathematics and render it comprehensible (T39)."

Discussion, Conclusion and Suggestions

The aim of this study is to reveal the knowledge of pre-service mathematics teachers about what mathematical connections is, for what purpose and how to do it before and after the mathematical connections lesson, and thus the change in their knowledge. The findings revealed that 10% of the pre-service teachers did not know anything about mathematical connections and the rest of them defined it simply as "making connections with daily life" and "making connections with numbers and operations" before the training offered under this study. Moreover, the purposes of using different types of mathematical connections they specified were limited. The pre-service teachers who offered a definition, divided over the purpose of

mathematical connections. Indeed, this study ascertained that while 55% of the participants reported that they use mathematical connections "to make mathematics easier, to reduce math anxiety and concerns, to show that mathematics underlies the universe, under the heading of connections with real life", 35% of them stated that they aimed "to teach mathematics traditionally based on only numbers and operations, under the heading of connections with operations." The finding that the pre-service teachers often mentioned the connections with 'real life' and 'numbers-operations', is plausible considering the fact that traditional real life problems are abundant in textbooks, as determined by several studies in the literature (Gainsbourg, 2008; Özgeldi & Osmanoğlu, 2017). The pre-service teachers pointed to mostly connections with operations, which is consistent with the findings of Eli (2009), demonstrating that the secondary-school-level pre-service mathematics teachers make predominantly operational connections rather than conceptual ones.

This study ascertained that the pre-service teachers did not have any knowledge on different types of mathematical connections prior to this study and that failed to exemplify the types of connections they could define. This finding is supported by the study Leikin & Levav-Waynberg (2007), who reported that teachers have difficulty giving an example of connection activity and that this is caused by their lack of experience on connection.

In conclusion, it is reasonable to argue that the mathematical connections lessons by the researcher was useful for the pre-service teachers and improved their skills on mathematical connections, considering the group assignments submitted by them as required by the mathematical connections lesson plan. Indeed, including the four pre-service teachers who stated that they had never heard the concept of connection before, all pre-service teachers stated after the training that they could make mathematical connections with "daily life, other disciplines, different representations, conceptually and operationally, as well as elements of entrepreneurship education", and could present examples of connections in the group assignments they submitted. Performing a study with pre-service teachers, Özgen (2017) emphasized the need to develop the skills of pre-service teachers to make mathematical connections with different disciplines and reported that to achieve this, it is necessary to offer trainings for pre-service teachers to design connection activities. Similarly, Eli, Mohr-Schroeder & Lee (2011) studied connection with a sample of pre-service teachers and concluded that they have in-depth knowledge on connection process in mathematics teaching and that they improve their knowledge before they start teaching. In addition, in the studies of Dişbudak-Kuru and Işıksal Bostan (2023), it was observed that pre-service teachers' mathematical connections skills improved as a result of training on mathematical connections skills.

Importantly, this study underlined how important it is to formally learn mathematical connections for pre-service teachers before starting teaching and to incorporate what they have learned into activities considering the learning areas and achievements in the mathematics curriculum. The importance of this is also evident in the findings of this study. Because, the pre-service teachers, who had a shallow knowledge of mathematical connections before this study, presented different connections and submitted creative, original assignments after the study. Hines (2002) determined that when teachers give students the opportunity to create and interpret different representations, students have better conceptual learning and emphasized that teachers should have well-established connection skills in this process. This emphasis is appropriate given the connection knowledge and skills of the pre-service teachers in this study before and after the training offered.

Considering the learning areas in the mathematics curriculum, it has been seen that mathematical connections can be made more in some learning areas, while in others they are limited or even not made. In this sense, it is recommended that researchers and educators design different mathematical connections activities for learning areas. A study like this one could be conducted with many pre-service teachers who attended the same course in other universities, and the results obtained would be useful for comparison. Also, a similar study could be performed with the pre-service teachers in different levels at university to offer more

extensive findings. The knowledge of mathematics teachers of mathematics teaching and connections skills can be explored through a case study, and the results can be compared with the findings of the studies on pre-service teachers. Based on the results of this study, future research may evaluate the courses given on the connections skills in undergraduate education and the efficiency of these courses.

Ethics Committee Approval

In this study, all the rules specified to be followed within the scope of "Higher Education Institutions Scientific Research and Publication Ethics Directive" were complied with.

Ethics committee permission information

Name of the committee that made the ethical evaluation = Abant İzzet Baysal University Human Research Ethics Committee in Social Sciences

Date of ethical evaluation decision=01.06.2021

Ethics assessment document issue number=2021/217

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The Predictive Power of Students' Pygmalion Perceptions on Broken Window Theory: An In-Class Empirical Research

Research Article

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ABSTRACT

The self-fulfilling prophecy theory has entered the literature with the assumption that false belief patterns can turn into reality over time. Then, it has been applied to the classroom in educational sciences disciplinary and has been examined by researchers for more than fifty years in the literature as the "Pygmalion effect" with their findings on how the positive expectations of teachers affect the future academic success of students. The broken windows theory, which constitutes the other theoretical framework of the research, set out with the assumption that if small problems that are ignored are not intervened, they will grow like in the snowball metaphor and cause social events that cannot be overcome. This theory has entered educational sciences as a zero-tolerance policy and many negative results have been reported. When the literature is examined, it has been revealed that aspects of the Pygmalion effect have not been investigated except for its impact on academic or work performance. In line with this blind spot, the main purpose of the research is to discover the predictive power of the Pygmalion effect on organizational broken windows. The population of the present research consists of 400 students in the physical education and sports college of a state university. The research was carried out with a total of 195 samples using the simple random sampling method. In the data analysis, simple regression analysis, correlation, and regulatory effect analysis were performed, respectively. Looking at the results of the research, it was seen that the Pygmalion effect had a negative impact of -36% on the organizational broken window, and at the same time, sex and age variables did not have a regulatory effect on this impact. It has been observed that the sub-dimensions of the Pygmalion effect (social-emotional learning environment and input-opportunities-feedback) have a negative effect on the managerial factor, which is the sub-dimension of the organizational broken window scale. When the results of this study are considered holistically, it is thought to serve as an information marker for future research, as it reveals the effect of the Pygmalion effect upon reducing negative behavioral attitudes in broken windows theory in a broader understanding.

Keywords:
Pygmalion Effect, Broken Window, Feedback, Social-Emotional Learning Environment.

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Introduction

Broken Window Theory

The concept of broken window, which seems like an object that has lost its property when first heard, is a theory put forward by Wilson and Kelling (1982) as a result of the experimental studies of Zimbardo and his students in order to make sense of some organizational problems. Zimbardo carried out his experiment with his students in 1969. Two cars of the same model, whose engine covers were left open and the license plates were removed, were used for the experiment. One of the vehicles was placed in a neighborhood that could be called a suburb, and the other vehicle was placed in a neighborhood with a slightly more advanced education level. In the continuation of the process, the first vehicle left was looted within minutes, and no one touched the other vehicle. One week after the experiment, when the researchers broke a window of the vehicle placed in the neighborhood with a high level of education, they soon saw that this vehicle was looted, too. This experiment was repeated not only in vehicles but also in abandoned buildings, and the same result emerged (Welsh, 2015; As cited in Kayral, 2019). All researchers agree that when a window of a building is broken, and if a new one is not installed, other windows will be broken. This situation is valid in suburban neighborhoods as well as in neighborhoods with a high level of education and morality. The source of the difference; while there are people determined to break windows on one side, there are windows lovers on the other (Sridhar, 2006). When we look at the negative mass behaviors that occur in organizations, it is seen unethical behaviors that are neglected and ignored at first cause problems after a while. If no sanction is applied to a person who does their work sloppy in the organization, it can be seen that other people disrupt their work after a while (Bektaş et al., 2019).

According to Wilson and Kelling (1982), broken windows theory states that if the places that cause the perception of lack of ownership, lack of control, lack of maintenance or repair are not under control, this situation will cause more crime. According to the theory of broken window, the most important factor in the occurrence of this crime is mass psychology. Le Bon (1997) claims that in mass psychology, the individual gains an invincible power by abandoning the instincts that one can restrain when they are alone, with a feeling of excess number. Because the masses are nameless and irresponsible, they completely alienate one from their sense of responsibility and make them more easily give up on their instincts. Wilson and Kelling (1982) advocated broken windows theory in that if the need for security in the public order as well as the irregularities in the physical environment are not corrected they will increase. They stated that the irregularity of the physical environment causes the perception society is not taken care and that people who are prone to crime turn these irregularities into opportunities and turn to crime.

If broken window situation has occurred within an organization, there may be situations such as a decrease in the productivity of the employees, a decrease in their loyalty, and avoidance of self-sacrifice. Social control mechanisms are needed to prevent the destructive effect of the broken window situation (Nalçacıgil, 2020). Broken windows theory is a social order theory that is as valid as perception, from low-level situations such as crossing the road, trespassing, and drunkenness in the social environment, to aggression, and murder (Green, 2015). Many people can give subjective examples of the broken windows theory through observation. Temir (2020) exemplifies the broken windows theory with the classroom setting. According to this, failure to give the necessary warning to someone who talks in the classroom environment may cause the whole class to talk, throwing garbage in a place where garbage cannot be thrown may cause everyone to throw garbage there.

Pygmalion Effect

The Pygmalion effect emerged as a psychological metaphor. We see that Merton (1948) applied the metaphor of Pygmalion, which creates a positive effect as a result of expectations, to educational psychology.

The concept of Pygmalion also appears as a self-fulfilling prophecy. Since the concept was adapted to education by Rosenthal and Jacobson (1968) in the historical process, it is also called the 'Roshental effect' (Dönertaş, 2021).

The Pygmalion effect occurs when teachers' expectations about students' performance become self-fulfilling prophecies. If we use another expression for the Pygmalion effect; students may perform above or below their teachers' expectations (Benton, 1991). Tauber (1998) stated, related to this issue, that the expectation of the teacher from the student can have both positive and negative effects on the student. Even an artificial expectation that teachers set up in their own minds can have effects on students' performance (Rosenthal & Jacobson, 1968). Hock (2009) stated that the students to whom the teachers paid special attention achieved positive development. According to the research of Reynolds (2007), it was mentioned that the positive verbal suggestions of the teachers to the students can also affect the performance of the students negatively (As cited in Balcı & Ağ, 2018).

Locke and White (2000) indicate that the Pygmalion effect is also related to the concept of leadership. Managers' attitudes towards their subordinates have a direct positive or negative effect on their performance. In general, a manager who acts harshly and rudely can have negative effects on the performance of his subordinates. Contrary to this situation, if the managers are too indifferent to their subordinates, the subordinates will not try to improve their own performance. In this case, it can also cause negative effects. If the manager wants to get a performance in favor of the organization, they should be firm when necessary, but also gentle when necessary (Bridge, 2003; as cited in Gündüzalp & Özan, 2019). Employees whose leaders expect them to show a high level of performance are more motivated toward development than employees whose leaders have low expectations (Bezuijen et al, 2009).

When we look at the relationship between leadership style and the Pygmalion effect; there is a reciprocal relationship between the leader and his followers, teachers and students, managers and the managed. From this point of view, the way leaders, teachers, or managers guide their subordinates and the way they express their expectations are very important factors on the expected performance (Dönertaş, 2021). Locke and White (2000) stated that it is impossible for the superiors in an organization to ignore the expectation phenomenon from the subordinates in order to get efficiency. The communication of managers and leaders who expect performance from their subordinates and how they treat them have a great effect on the performance of these people, either positively or negatively. This kind of behavior exhibited can have great effects on a person's career development also.

Rubie-Davies (2014) defines the deep-rooted expression 'teacher expectations' as judgments about when and what they can achieve in academic or other abilities by following the information received from students. It is seen that the concept known as the Pygmalion effect in the field of educational sciences takes place in the literature as "teacher expectation" and is interpreted through this concept. Teacher expectation, the impact of expectations from students, and its aftermath output have a long history of educational research that began before the concept of Pygmalion (Johnston et al., 2021). Another concept, broken windows, inspired by the theory, turned into a policy and was researched under the title of "zero tolerance" in the field of educational sciences. When it comes to the root of zero tolerance, regardless of the scale of the behavior, it acts with a philosophy formed with a punitive logic with predetermined rules in an intolerant manner (Skiba et al., 2006).

There is no zero-tolerance practice in the education policy of our country. However, the possibility of performing inappropriate behaviors in the broken windows theory when the lack of management is felt is a situation that can always be in the classroom. Especially when the studies are examined, the Pygmalion effect is generally examined in terms of its impact on academic achievement, and it is seen that the effect on behavior does not attract the attention of researchers. On the other hand, there is little or no empirical work in the educational setting on the theory of broken windows. Based on the deficiencies in this literature, the

importance of this study emerges here. It is hoped that the presence of the Pygmalion effect has an effect predicting inappropriate behavior in the broken windows theory will expand the work in this area. More importantly, what kind of gains the sub-dimensions of the Pygmalion effect (social-emotional learning environment, input-opportunities-feedback) will provide for students not only academically but also behaviorally, and the effect on negative behaviors or attitudes will be supported by empirical data.

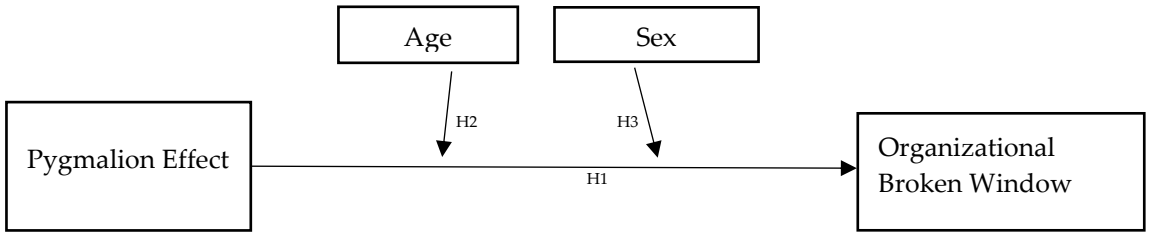
Methodology

Research Objective and Model

The main purpose of the research is to determine the effect of academicians' behaviors on students and the Pygmalion effect on broken window attitude, as well as to discover whether age and gender variables have a regulatory role. The second aim is to discover whether the Pygmalion effect scale sub-dimensions have an effect on the broken window attitude sub-dimensions. In order to test our developed hypothesis questions, the analyzes were carried out in three stages and the results were visually indicated in tables.

The two models developed in the research are shown below:

Model 1: A Research Model on the Direct Impact of Pygmalion Effect on Broken Window Attitude and the Regulatory Role of Demographic Variables



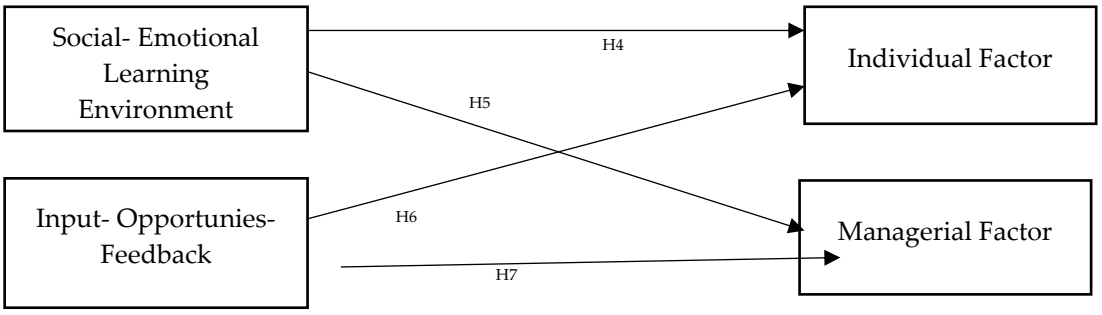
Hypotheses

H1: Does the Pygmalion effect have a significant effect on organizational broken windows attitude?

H2: Age variable has a regulatory role in the impact of the Pygmalion effect on organizational broken windows attitude.

H3: Gender variable has a regulatory role in the impact of the Pygmalion effect on organizational broken windows attitude.

Model 2: A Research Model on the Effects of Social-Emotional Learning Environment and Input-Opportunities-Feedback from the Sub-Dimensions on the Individual Factor and the Managerial Factor



H4: The social-emotional learning environment has a significant effect on the individual factor.

H5: The social-emotional learning environment has a significant effect on the managerial factor.

H6: Input-Opportunities-Feedback has a significant effect on the individual factor.

H7: Input-Opportunities-Feedback has a significant effect on the managerial factor.

Study Group

The population of the research consists of 400 university students studying at Adıyaman University School of Physical Education and Sports. The complete inventory method was used as a basis for data collection. Simple random sampling method was used for the population consisting of the Physical Education and Sports Teaching Department and Coaching Education Department (Karasar, 1995). In this context, a scale form was distributed to all students. The number of returned scales is 195. This number of participants is seen as sufficient (Stevens, 1996; Tabachnick et al., 2007).

Data Collection

The data were collected using a questionnaire that included students' demographic characteristics and introductory information, and the organizational broken window scale, as well as the scale of the Pygmalion effect of instructional leader behaviors on students.

Personal Information Form

The personal information form created by the researcher consists of two questions (gender, age).

Organizational Broken Window Scale

The organizational broken windows scale developed by Bektaş et al. (2019) consists of 13 items, 2 factors (individual, managerial) and 5 Likert's. The Cronbach alpha coefficient of the scale is 0.92.

The Scale of Pygmalion Effect of School Principal's Instructional Leadership Behaviors on Students

The scale of the Pygmalion effect of the school principal's instructional leadership behaviors on students, developed by Dönertaş (2021), consists of 22 items, 2 sub-factors (social-emotional learning environment, and input-opportunities-feedbacks) and 5 Likert's. It is seen that the Cronbach's alpha coefficient of the scale is above 0.94 in the sub-factors. The fact that this coefficient is more than 0.80 indicates that the measured data are reliable. While collecting data for the purpose of this research, the expression of academician was used instead of the expression of the school principal in the subject of the scale.

Analysis of the Data

SPSS 24, AMOS and SPSS Process analysis programs were used in the analysis of the data. Confirmatory Factor Analysis (CFA) was performed to test the validity of the factors of the scales in our sample group. The SPSS Process tested whether demographic variables such as age and gender have a regulatory effect (Gürbüz, 2019, p. 87; Kerse et al., 2020, p. 1775). Simple regression analysis was performed to test the predictive-effect power between the dependent (organizational broken windows, individual and managerial factor) and independent variable (Pygmalion effect, social emotional learning environment, input-opportunities-feedback). Pearson correlation test was used to reveal the relationship between scale total scores and sub-factors. In line with the aims of the research, the relational screening model was used. Correlation and simple regression analysis techniques were used in the analysis of the data in the study. Relational screening model is a research model used to determine the existence and level of change between two or more variables (Karasar, 2011).

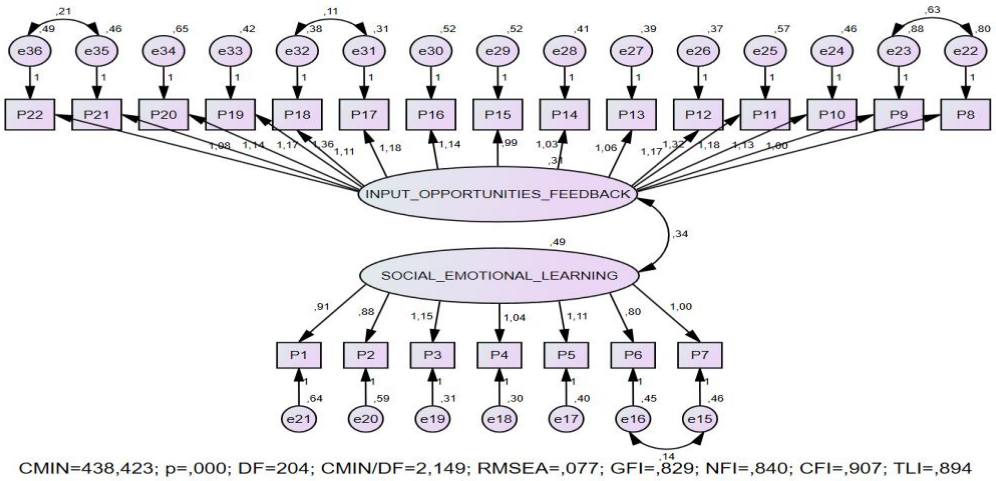


Figure 1. Confirmatory Factor Analysis of Pygmalion Effect Scale (CFA)

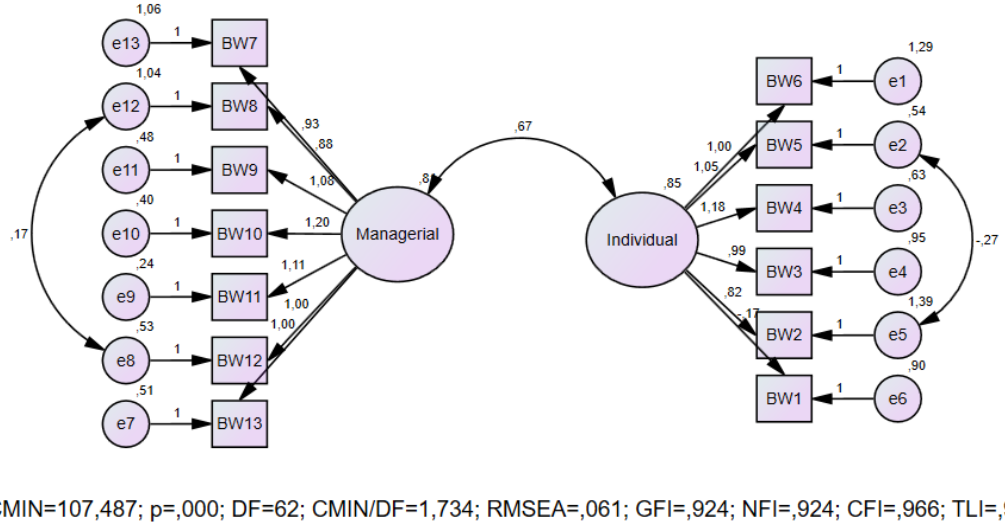


Figure 2. Confirmatory Factor Analysis of Organizational Broken Window Scale (CFA)

Table 1. Pygmalion Effect, Organizational Broken Window Scale Fit Indices

	0≤χ2/D≤5	0<RMSEA<08	00<SRMR<,10	80≤GFI<10	80≤NFI<10	90≤CFI<10	80≤TLI<10
Pygmalion Effect	2,1	,77	,53	,82	,84	,90	,89
Organizational Broken Window	1,7	,61	,42	,92	,92	,96	,95

When Table 1. is examined, the confirmatory factor analysis results of the Pygmalion effect scale were determined as [CMIN/DF=2.149, RMSEA=0.77, SRMR=0.53, GFI=0.82, NFI=0.84, CFI=0.90, TLI=0.89]. The confirmatory factor analysis results of the organizational broken window scale were determined as [CMIN/DF=1.734, RMSEA=0.61, SRMR=0.42, GFI=0.92, NFI=0.92, CFI=0.96, TLI=0.95]. (Schermelleh-Engel et al., 2003, p.52; Simon et al., 2010, p. 238; İlhan & Çetin, 2014, p. 31; Meydan & Şeşen, 2015: p. 37; Mankin et al., 2019, p. 142).

The Cronbach's Alpha Coefficient accepted for reliability analysis values between 0 and 1 and this value is expected to be 0.70 and above (Altunışık et al., 2010, p.124). The Cronbach's Alpha value calculated for the Pygmalion effect scale is 0.945. The Cronbach's Alpha value of the social-emotional learning environment sub-dimension was calculated as 0.880, and the input-opportunities-feedback sub-dimension was calculated as

924. According to these findings, it can be said that the scale is a 2-dimensional (22 items) reliable and valid scale. The Cronbach's Alpha value calculated for the organizational broken window scale is 0.898. The Cronbach's value for the individual sub-dimension was calculated as 0.732, and the Cronbach's value for the managerial sub-dimension was calculated as 0.908. According to these findings, it can be said that the scale is a 2-dimensional (13-item) reliable and valid scale.

Skewness and Kurtosis values were checked for the normality test of the data. Normality values were calculated as Skewness (-.380) and Kurtosis (.346), for the scale of the Pygmalion effect Skewness (-.480), and Kurtosis (-.564), and Skewness -.271) and Kurtosis (-.652) for the social-emotional learning environment sub-dimension. Normality values were calculated as Skewness (.693) and Kurtosis (-.327) for the organizational broken window scale, Skewness (.387) and Kurtosis (-.628) for individual factor sub-dimensions, Skewness (.845) and Kurtosis (-.378) for managerial factor sub-dimensions. Since the values were between -1.5 and +1.5, it was decided that the data showed a normal distribution (Tabachnick & Fidell, 2013).

Ethics Committee Approval:

In order to carry out this research, the ethics committee approval dated 05.04.2022 and numbered E.48071 was obtained from the Non-Interventional Research Ethics Committee of Munzur University.

Findings

Table 2. Demographic Variables

Variable	Group	N	%
Sex	Male	133	68,2
	Female	62	31,8
Age	18-21	107	54,9
	22 and Above	88	45,1

Table 3. Regression-Correlation Analysis Results for the Organizational Broken Window Scale and its Sub-Dimensions and the Pygmalion Effect Scale and its Sub-Dimensions

Independent Variables	Dependent Variables	Pearson Correlation (r)	β	Std. Error	t	R^2	F	p
Constant			3,788	,363	10,435			
Pygmalion Effect	**Organizational Broken Window**	**-,281****	**-,363**	,089	-4,072	,079	16,580	**,000**
Constant			3,346	,342	9,782			
Social Emotional Teaching	**Individual Factor**	**-,143***	**-,165**	,082	-2,005	,020	4,021	**,046**
Constant			3,792	,375	10,109			
Social Emotional Teaching	**Managerial Factor**	**-,324****	**-,430**	,090	-4,756	,105	22,621	**,000**
Constant			3,234	,370	-8,731			
Input-Opportunities-Feedback	**Individual Factor**	**,110**	**-,141**	,091	-1,541	,012	2,374	**,125**
Constant			-4,046	,401	10,079			

Input-Opportunities-Feedback	**Managerial Factor**	**-,343****	**-,503**	,099	-5,076	,118	25,769	**,000**

Looking at Table 3, the Pygmalion effect (independent variable) significantly and negatively affects organizational broken window (its dependent variable) (β: -.363, R2: .079, p: .000). Pearson correlation analysis results show that there is a moderate and significant relationship between the variables (r=-281). The Pygmalion effect explains 0.079% of the total variance. In other words, the .079% change in the dependent variable (organizational broken window) is explained by the independent variable (Pygmalion effect) included in the model. Looking at the non-standardized regression coefficients (β), a one-unit increase in the Pygmalion attitude causes a -36.3% decrease in organizational broken window attitude. Considering the t-test results regarding the significance of the regression coefficients, it is seen that the Pygmalion effect has a significant and negative effect on the organizational broken window attitude. Accordingly, the H1 hypothesis is accepted.

Table 4. Analysis Chart of the Regulatory Role of Age on the Impact of Pygmalion Effect's Predicting Organizational Broken Window

Model	**R**	**R²**	**MSE**	**Df1**	**Df2**	**p**
	2885	,0832	6610	3.0000	1910000	,0008
Dependent Variable: Organizational Broken Window (y)	**β**	**SH**	**t**	**p**	**LLCU**	**ULCI**
Pygmalion <effect (x) (b1 way)	-,3687	,0898	-4,1067	,0001	-,5458	-,1916
Age (w) (b2 way)	-,0474	,0584	-,8123	,4176	-,1626	,0678
X.W (b3 way)	-,0412	,0908	-,4535	**,6507**	**-,2203**	**,1379**

LLCI: Lowest confidence interval, ULCI: Highest confidence interval, and Non-standardized beta coefficients are reported.

When Table 4 is examined, the dependent variable is shown by y (organizational broken window), the independent variable by x (pygmalion effect), the regulatory variable by w (age), and the interactional effect by x.w. Process Macro is a statistical application that can explain indirect and intermediary effects with application steps thanks to the bootstrap technique (95% confidence interval and 5000 derivative sampling) method (Hayes, 2013).

The regulatory effect of the age demographic variable on the impact of the Pygmalion effect on the organizational broken window was investigated and its regulatory role was not found (p>0.05). As seen in Table 4, the Pygmalion effect affects the decrease in organizational broken window attitude. (β=-,3687 p<0,05). However, the regulatory effect was measured by adding the age factor to the model. According to the result obtained from the model, age was not found to have a regulatory role in the impact of the Pygmalion effect on organizational broken window (β=-.0412 p=.6507). The fact that the P value is greater than 0.05 and the Bootstrap 95% confidence interval values contain zero indicates that the hypothesis is denied. The fact that Bootstrap values contain zero indicates the insignificance of the model. Accordingly, the H2 hypothesis is denied.

Table 5. Analysis Chart of The Regulatory Role of Gender on the Impact of Pygmalion Leadership on Organizational Broken Window

Model	**R**	**R²**	**MSE**	**Df1**	**Df2**	**p**
	,3014	,0908	,6655	33.0000	1910000	,0004
Dependent Variable: Organizational Broken Window (y)	**β**	**SH**	**t**	**p**	**LLCU**	**ULCI**

Pygmalion Effect (x) (b1 yolu)	-,3633	,0890	-4,0812	,0001	-,5388	-,1817
Sex (w) (b2 yolu)	-,0904	,0581	-1,5548	,1216	-,2050	,0243
X.W (b3 yolu)	-,0187	,0886	,2110	**,8331**	**-,1561**	**,1935**

LLCI: Lowest confidence interval, ULCI: Highest confidence interval, and Non-standardized beta coefficients are reported.

When Table 5. is examined, the dependent variable is shown by y (organizational broken window), the independent variable by x (pygmalion effect), the regulatory variable by w (gender), and the interactional effect by x.w. No regulatory role of age demographic variable was found in the impact of the pygmalion effect on organizational broken window (p>0.05). As seen in Table 5, the increase in students' pygmalion effect perceptions affects the decrease in the organizational broken window. (β=-.3633, p<0.05). However, the regulatory effect was measured by adding the gender factor to the model. According to the result obtained from the model, no regulatory role of gender was found in the impact of the pygmalion effect on organizational broken window (β=-.0187 p=.8331). The fact that the P value is greater than 0.05 and the Bootstrap 95% confidence interval values contain zero indicates that the hypothesis is denied. The fact that Bootstrap values contain zero indicates the insignificance of the model. Accordingly, the H3 hypothesis was denied.

Looking at Table 5, the social-emotional learning environment sub-dimension variable affects the individual factor sub-dimension variable significantly and negatively (β:-.165, R2:.020, p:.046). Pearson correlation analysis results show that there is a low and significant relationship between the variables (r=-143). Social-emotional learning environment explains 020% of the total variance. In other words, the change of 0.020% in the dependent variable (individual factor) is explained by the independent variable (social-emotional learning environment) included in the model. Considering the non-standardized regression coefficients (β), a one-unit increase in the social-emotional learning environment sub-dimension causes a -16.5% decrease in the individual factor. Considering the t-test results regarding the significance of the regression coefficients, it is seen that the social-emotional learning environment has a significant and negative effect on the individual factor. Accordingly, the H4 hypothesis was accepted.

Looking at Table 5, the social-emotional learning environment sub-dimension variable affects the managerial factor sub-dimension variable significantly and negatively (β:-,430, R2;,105, p:,000). Pearson correlation analysis results show that there is a moderate and significant relationship between the variables (r=-324). Social-emotional learning environment explains 10.5% of the total variance. In other words, the 10.5% change in the dependent variable (managerial factor) is explained by the independent variable (social-emotional learning environment) included in the model. When the non-standardized regression coefficients (β) are examined, a one-unit increase in the social-emotional learning environment sub-dimension causes a -43% decrease in the managerial factor. Considering the t-test results regarding the significance of the regression coefficients, it is seen that the social-emotional learning environment has a significant and negative effect on the managerial factor. Accordingly, the H5 hypothesis was accepted.

Looking at Table 5, the input-opportunities-feedback sub-dimension variable does not have a significant effect on the individual factor sub-dimension variable (β:,110, R2:,012, p:>,125). Pearson correlation analysis results show that there is no significant relationship between the variables (r=110). Accordingly, the H6 hypothesis was denied.

Looking at Table 5, the input-opportunities-feedback sub-dimension variable significantly affects the managerial factor sub-dimension variable (β: -.503, R2: .118, p: .000). Pearson correlation analysis results show that there is a moderately significant relationship between the variables (r=-.343). Input-opportunities-back sub-dimension explains 11.8% of the total variance. In other words, the 11.8% change in the dependent variable (managerial factor) is explained by the independent variable (input-opportunities-feedback) included in the model. When the non-standardized regression coefficients (β) are examined, a one-unit increase in the input-

opportunities-feedback sub-dimension causes a -50.3% decrease in the managerial factor. Considering the t-test results regarding the significance of the regression coefficients, it is seen that the input-opportunities-feedback has a significant and negative effect on the managerial factor. Accordingly, the H7 hypothesis was accepted.

Discussion and Conclusion

In this study, the theory of broken window, which has taken its place as zero tolerance in the education environment, with the Pygmalion effect that directs the attitudes and behaviors of the individuals in the subordinate position in line with the expectations of the people in the upper position has been examined relationally. They both have a growing literature. This research has been handled in line with two main-layered purposes. The first is to explore how the Pygmalion effect of the academics' in-class approaches toward students at the university affects the behavioral attitudes involved in the organizational broken window. The second is to determine the effects of the Pygmalion effect scale sub-dimensions (social-emotional learning environment and input-opportunities-feedback) on the sub-dimensions (individual and managerial) of the organizational broken window scale. Also, it is among the sub-objectives to discover whether age and gender factor has a regulatory effect on this effect.

Broken window theory is based on the assumption that if minor incidents (garbage, unpainted or unregulated buildings, idlers, etc.) that occur in public places are not intervened, these places may become attractive to other people who are prone to crime and gradually initiate a social erosion in that region. The theory argues that in order to avoid this situation, deteriorating physical conditions should be immediately corrected and minor criminal violations should be punished (Bell, 2015). The education community, which saw that the theory of broken windows was effective in preventing crimes in the city, started to apply this model in the field of education under the name of "zero tolerance". Zero tolerance has been implemented by making a very harsh introduction to the education system. Zero tolerance policy was introduced by making harsh and punitive interventions under the name of proactive policing (Poe-Yamagata & Jones, 2000; Wald & Losen, 2003). In this context, the desired result could not be achieved when the concept of zero tolerance was integrated and applied to the field of education for the first time. Therefore, there is strong evidence in the studies that the broken window-zero tolerance model applied in educational settings can lead to serious social erosion when it moves away from its trajectory.

Zero tolerance policy applied in schools has been associated with excessive sanction, and especially some student groups in schools have been subjected to severe and disciplinary practices with negative effects, followed by expulsions (Gopalan & Nelson, 2019; Homer & Fisher, 2020; Huang, 2020; Ksinan et al., 2019; Ko et al., 2021; Pesta, 2018; Roland et al., 2012; Shores et al., 2020; Welsh, 2022). In similar studies, it was found that the exposure of the students' close friends to violent crimes causes stress and lowers their test scores (Sharkey, 2010; Sharkey et al., 2014), while the presence of security forces in schools causes students to have weaker relationships with teachers (Fisher et al., 2019). Also, it was found that students who have contact with the police in some way face some psychological problems or their psychological problems are triggered (Suqie & Turney, 2017; Skiba & Losen, 2015), students who are suspended have a higher probability of academic failure as a result of dropping out of school and missing study period over time than those who are not suspended (Anderson et al., 2019; Bacher-Hicks et al., 2019; Lacoe & Steinberg, 2018; Noltemeyer et al., 2015). Despite these negative results, we come across a study where almost 75% of teachers found that zero tolerance is important for safety (Huang & Cornell, 2021). In addition to this, there are studies that show that it can improve educational outcomes as a reflection of its effect on neighborhood crime, it does not affect attitudes about school, but only negatively affects attendance at school (Legewie & Fagan, 2019; Losen, 2015).

Based on the hypothesis that constitutes the main frame of the research, it has been observed that the Pygmalion effect, which occurs as a result of the in-class approaches of the academicians, has a negative effect

of -36% on the organizational broken window attitude. In this effect, the regulatory role of age and gender was also examined and it was seen that neither gender nor age had a regulatory role in this effect. In a similar study, the expectations and thoughts of the administrators were examined with the perception of a teacher, and it was seen that there was no significant difference in the gender variable and that the expectations of the administrators had a positive effect on the teacher in general (Gündüzalp & Ozan, 2019). If these data are to be explained in other words, the Pygmalion effect caused by the positive attitudes of the academicians reduces the possibility of students to feel the weakness of security and to do the same with the negative behaviors of their friends. From a different perspective, we can say that this reducing effect is due to the fact that students focus their perceptions on the expectations of educator leaders, not focusing on the in-class security-punishment weakness in the broken window theory. The premise of the concepts of Pygmalion or teacher expectation is united in the same pot. Namely, when the instructors (leaders) conduct their interactions with students (subordinates) through expectations, these expectations turn into a powerful and magically increasing performance-based Pygmalion effect (Rubie-Davis et al., 2014; Rosenthal, 2010). In the field of educational sciences, it is possible to encounter many empirical findings that indirectly support the research result related to the concept of "teacher expectation", which has a wide research background.

The Pygmalion effect, which occurs as a result of teacher expectation, has been extensively studied and the following conclusions have been reached; recent studies have proven that the expectation that teachers create for students or the feedback (pygmalion effect) received from students has a large share in their academic success (Adityawarman & Rositawati, 2019; D'Warte, 2014; Gentrup et al., 2020; Liou & Rojas, 2016; Papageorge et al., 2020; Peterson et al., 2016; Rubie-Davis et al., 2014; Rubie-Davies & Peterson, 2016; Szumski & Karwowski, 2019; Weinstein & Worrel, 2016; Weinstein, 2008; Zhu et al., 2018). In addition to the positive expectations of the teachers, it also causes negative results in the groups in which they have negative expectations (Van Houtte & & Demanet, 2016), and teacher expectations are more effective on students from low-income families, in particular (Gregory & Huang, 2013) The positive effect of this expectation on students' motivation, self-confidence and self-worth has been supported by studies. (Boerma, Mol & Jolles, 2016; Chandrasegaran & Padmakumari, 2018; Hornsantra et al., 2018; Urhahne, 2015; Stroet et al., 2013). In this success story, it is among the findings in studies that only extrinsic motivation alone is not sufficient, that is, the intrinsic motivation factor also affects students' success (Cerasoli et al., 2014; Taylor et al., 2014).

Another result of the research is that the social and emotional learning environment, which has an important place in the formation of the Pygmalion effect, has a very small effect on the individual factor, which is the sub-dimension of the organizational broken window. Contrary to this situation, there is a moderate adverse effect of -43% with its other sub-dimension, the managerial factor. These results are not surprising given the strong theoretical foundations. Researchers have been very interested in the subject of social-emotional learning environment and have given great duties and responsibilities to the instructors.

It is known that the creation of a positive learning climate by educators (teacher-academic) is related to the behavioral and instructional practice skills of the educator (Reddy et al., 2021). Positive emotional expressions used by educators increase the possibility of creating an emotionally safe environment for the student. This secure environment supports the social-emotional-behavioral development of students. Angry/aggressive behaviors are more common in classrooms where there are educators who are controlling and use a lot of negative expressions. The social-emotional learning environment reduces negative emotional states such as anxiety, shyness, and aggression, which are seen as negative features. At the same time, this positive climate acts as a shield against emotional attrition by activating the student socially (Andreychik, 2019; Kikas & Tang, 2019; Poulou et al., 2022; Valante et al., 2019). As well as the academic development of students, it is seen in studies that social and emotional skills support school engagement, self-confidence,

positive pro-social behaviors, being successful in their careers, and social, neural, cognitive, and emotional health (Corcoran et al., 2018; Durlak et al., 2011; Greenberg et al., 2017; Pakulak et al., 2017).

Another result of the study is that input-opportunity-feedback, another sub-dimension of the Pygmalion effect scale, is in a low-level relationship with the individual factor dimension of the organizational broken window. However, it was seen that there was a moderate relationship with the managerial factor and a reducing effect at the level of -50%. Based on the questions in the scale (the positive feedback of the academic staff allows me to continue my studies, the academic staff's praising the efforts increases my self-confidence, the academic staff's support for students' attempts strengthens my desire to set new goals for myself, etc.), this result is due to the fact that the academics in leader position exhibit an approach that will have a positive impact on students. Based on the perceptions of the students, the fact that the academicians provide opportunities for the students to develop and they give feedback creates the perception that the students are cared. In another study, it was observed that the educator's ability to communicate well with students in the classroom and that students do not feel excluded is very important in terms of academic and social learning experiences (Rosenbaum, 2020).

The feedback mentioned in the sub-dimension of the pygmalion effect scale used in this study takes place as a process in which they make sense of their performance in a teaching and learning approach through verbal and mutual communication exchange (Perry et al., 2020; Henderson et al., 2019a). There are findings that when an effective and energetic environment is created in the classroom when effective praise and feedback are given in a balanced way (because more feedback will reduce the effect or make the students feel that they have reached the desired level), academic achievement and prosocial behavior increase (Mardiah, 2020; Kerr & Nelson, 2010; Wheeler & Richey, 2010). Despite such a positive effect, there is more praise for academic achievement and less praise for behavior (Reinke et al., 2007). On the contrary, it is known that praise for behavior has a stronger effect and reduces behavioral problems (Myers et al., 2011; Thompson et al., 2012). The fact that undesirable student behaviors are experienced more frequently in environments where educators exhibit negative attitudes, give little feedback, and praise less support the finding of the research from a different perspective (Doumen et al., 2008; Partin et al., 2010). The existence of studies that show a decrease in problematic behaviors as educators support and praise students' positive behaviors also supports our finding (James et al., 2019; Zakszeski et al., 2020).

As a result, "Pygmalion Effect Theory", which has been turned into a research object and examined by researchers in recent years, has been examined with quantitative measurement tools in the context of "Broken Window Theory" in order to create current literature in the field of education.

As a result of the analysis, it is seen that the Pygmalion effect has a negative and significant effect on the broken window attitude. This means that the Pygmalion effect, which occurs at an effective level on students, reduces the inappropriate behaviors in the broken window model. Social learning environment and input-opportunity-feedback, which are sub-dimensions of the Pygmalion effect, affect the managerial factor of the organizational broken window negatively (reducing) and have a significant effect. Based on this finding, the main starting point of the organizational broken window theory is that if an inappropriate behavior stays unpunished, these behaviors will continue. In the Pygmalion effect theory, it comes to mind that expectation, following the student, giving feedback, and creating a social-emotional learning environment instead of punishment can be effective on these inappropriate behaviors of the students. With the simplest inference, instead of reducing the probability of students' misbehavior by creating a climate of fear, the Pygmalion effect model is to enable them to turn their perceptions towards positive rather than negative, with the belief that there are positive contributions both academically and behaviorally, without discriminating between students. At the same time, gender and age variables do not seem to have a significant regulatory effect on the effect of Pygmalion leadership on the organizational broken window. In other words, it has been seen that the age of

the students, whether they are older or younger or the gender is male or female, does not make any significant difference.

Suggestions

Although it is believed that this study will examine the factors affecting the unknown about how a concept such as organizational broken window will be reflected in the educational environment, and it is believed that it will add profundity to previous studies, it should be known that it approaches these concepts with caution. Therefore, the current research has some notable limitations. Considering these limitations, the discussion was supported by studies on sub-dimensions, since the Pygmalion effect and broken window attitude were not discussed together before. There is a need to generalize the effect in the findings by working with larger sample groups and to investigate whether it has the same effect supporting with mixed study designs. From another point of view, this research was designed on a quantitative research model, and it can be observed whether the Pygmalion effect affects the broken window behavior by observing the behavior of the Pygmalion effect in an experimental way. More importantly, how the Pygmalion effect developed on students academically was investigated. However, the fact that the rate of explaining the organizational broken window attitude in the analyzes was low, in addition to the fact that the effect on behavior was not examined, constitutes another caution of the research. From this point of view, suggestions are presented for educators and researchers in the field of research, inspired by the models tested, deficiencies observed, and refined in recent studies.

In particular, it should not be ignored that the sub-dimensions of the Pygmalion effect (social-emotional learning environment, input-opportunities-feedback) should be done meticulously and that these skills require a certain competence (Broadbent et al., 2018). It is known that university students were included in the sample group of the study. It is generally observed that not much feedback is given by academics, especially in written form, and it is observed that feedback is not adequately understood by students and educators in studies (Carroll, 2014; Carless & Boud, 2018; Pitt & Norton, 2017). It can be said that the occurrence of this situation is due to the lack of a sufficient number of faculty members, the time constraints of face-to-face interviews, and the fact that students are too grade-oriented (Henderson et al., 2019; Rand, 2017).

For effective feedback in higher education, it is very important for students to make sense of this statement, and to be action-oriented and its impact is very important (Ryan et al, 2020). For this reason, educators should pay attention to some issues while giving feedback. So, when giving feedback; (Ryan, 2021), the social and emotional effects of harsh-judgmental-offensive critical statements that can harm self-esteem and success should be considered (Rowe, 2017), a learning-oriented and bilateral feedback model should be created (Carless & Winstone, 2019), notifications should be made by considering the capacity of the student rather than using too much academic language (Winstone et al., 2017a). In addition, while praising the student, it is necessary to make the praise carefully, as making them feel that they are doing their best may create the perception that there is no need to do better (Molloy et al., 2020).

It should be known that expectations will only be insincere and empty words unless they act in an embracing manner toward everyone in the classroom (Anderson & Graham, 2016). In addition to all these suggestions, it is of critical importance that an information-based feedback is more effective (Wisniewski et al., 2020), the formation of fun classroom environments for students to focus their attention, their interaction with the student, the fact that the students can see their facts, and the school's contact with the community it is connected to are also important (Little & Welsh, 2022). It should not be ignored that when it is assumed that there is communication about the feedback, especially in the content of the audio feedback, it can be more effective in explaining complex issues (Merry & Orsmond, 2008). For the development of students, it is necessary for educators to contribute to their development by exhibiting fair behavior without prejudice to their cultural backgrounds (Dorinda et al., 2017). It should also be known that expectation practices should

not be done haphazardly. Therefore, educators should be trained in expectation practices, parents should be supported by including them in this climate, and feedback should be an important part of the curriculum (Speckesser et al., 2018; Weinstein, 2018).

In addition to creating positive expectations for students, there are also situations where teachers see students as disadvantaged or differ in their expectations of support and care (Domen et al., 2018; Hospel & Galand, 2016; Hornstra et al., 2015; Rubie-Davis et al., 2012). In this situation, it should be felt that the possibility of teachers not creating expectations purposely or not purposely can turn into a disadvantage. Finally, the individual's social and individual relationships and social-emotional experiences are very valuable for the development of the body and brain. In order for students to develop further, awareness should be created by explaining the importance of including all these actors in the climate of the classroom (Chan et al., 2018; Immordino-Yang et al., 2019; Swain et al., 2017).

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Examining Pre-Service Social Studies Teachers' Cognitive Structures and Misconceptions About Environmental Problems Through the Word Association Test

Research Article

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ABSTRACT

The aim of this study was to examine the cognitive structures and misconceptions of pre-service social studies teachers about environmental problems. The study was a descriptive study based on survey model. Convenience sampling, one of the purposive sampling techniques, was used in sample selection and 143 pre-service teachers studying at Fırat University Faculty of Education participated in the study. The word association test prepared by the researcherss was used as the data collection tool. The word association test is one of the alternative assessment methods devised to expose individuals' cognitive frameworks and misconceptions on a conceptual level. Descriptive analysis technique was used in data analysis. The data collected through the word association test were examined and the number of repetitions of the responses associated with each key concept was identified. The responses associated with the key concepts were presented in the form of concept networks based on cut-off points. The results indicated that the participants demonstrated adequate cognitive frameworks concerning air pollution, water pollution, soil pollution, and deforestation; however, they had insufficient knowledge regarding the key concept of erosion.

Keywords:
Environmental problems, word association test, cognitive structure, misconception, social studies

Introduction

Although mankind had maintained a good relationship with other living beings and the environment from the existence of the world to the industrial revolution, the desire of mankind to dominate nature and use natural resources as if they were unlimited accelerated after the 17th century with the industrial revolution.

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This has led to the emergence of many environmental problems all over the world, especially in Western countries (Görmez, 1991). Geray (1995) argues that environmental problems are due to the fact that people are willing to benefit from the environment they live in as much as possible and prioritize their own interests over the common interests and values of the society. Environmental problems, consequences of technology developed for the desire of people to meet their needs, have brought about the necessity of raising individuals with environmental sensitivity in order to build a more habitable and healthy ecosystem for future generations (Durmuş & Kınacı, 2021a). For this reason, environmental problems have been on the agenda of the leaders who establish the world's political, education and science policies since 1970, and the concept of environmental education has emerged in a few countries (Ünal & Dımışkı, 1999). Since then, environmental education programs have been developed in order to address environmental problems, and many studies on the environment and environmental awareness have been conducted. These studies indicated that education plays a key role in maintaining the balance of nature and providing environmental awareness (Akınoğlu & Sarı, 2009). Accordingly, environmental education is provided at all levels in schools today.

Although environmental education is provided at all levels in formal education, it starts first in the family. If environmental education is not adequately taught within the family, the significance of education in school becomes much more important. Students become aware of the environmental problems adequately by identifying their prior knowledge and misconceptions at schools (Akınoğlu & Sarı, 2009; Bozkurt & Cansüngü Koray, 2002). Concepts play an important role in social studies education, which is an important discipline in the world as well as in Türkiye. As some of these concepts have an abstract structure, misconceptions can occur frequently, which requires attention. For this reason, effective and sufficient concept teaching is required in order to raise effective citizens with the necessary knowledge and skills in life, which is the main purpose of the social studies course (Çal Pektaş, 2021; Soylu & Memişoğlu, 2019).

Although it is acknowledged that teaching abstract concepts in social studies can lead to misconceptions, another critical aspect that requires attention is understanding when and how the concept was initially learned. By identifying the abstract concepts that students struggle to grasp and those that are interconnected, and teaching them with caution, it is possible to prevent the development of misconceptions that are challenging to correct in the future. Therefore, students' previous knowledge and misconceptions about these concepts should be identified, especially in the teaching of abstract concepts, and these misconceptions should be removed. One of the methods used to reveal students' cognitive structures and misconceptions about concepts is word association tests. In this study, word association test was used to examine pre-service teachers' cognitive structures and misconceptions about environmental problems.

A literature review reveals that there are studies on the examination of the misconceptions of students and teachers at different levels about several environmental problems using a number of different data collection tools (Boyes & Stanisstreet 1993, Francis et al. 1993, Groves & Pugh, 1999, Khalid ,2001, Yılmaz et al. 2002, Bozkurt & Cansüngü-Koray, 2002, Bozkurt & Aydoğdu, 2004, Pekel & Özay, 2005, Erol, 2005, Demirkaya, 2008, Yılmaz-Tüzün et al, 2008, Yurttaş, 2010, Ürey, Şahin & Şahin, 2011, Polat , 2012, Özgen, 2013, Üstün Kurt, 2013, Doğan, Kutay & Çakır, 2016, Taşbaş, 2017, Özel, 2019, Durmuş & Sert, 2022, Durmuş & Kuruyer, 2022). The aim of this study was to examine cognitive structures and misconceptions of pre-service social studies teachers about environmental problems using word association test. It is not possible to educate environmentally literate students if the teacher does not have the knowledge, skills and responsibility to design the lessons for the environment (Plevyak et al. 2001). Durmuş and Kınacı (2021b) put forward that environmental education programs at universities should assist in enhancing teacher competencies and facilitate the transfer of this education to their future students. Pre-service teachers should adhere to the principles of environmental education and guide their students towards environmental education. Thus, it is of great importance to investigate the cognitive structures and misconceptions of pre-service social studies

teachers regarding environmental issues since they will be responsible for educating their students about the environment, encouraging them to develop positive attitudes and behaviors towards the environment, and taking proactive measures to solve environmental problems.

The aim of this study was to examine the cognitive structures and misconceptions of pre-service social studies teachers regarding environmental problems (air pollution, erosion, water pollution, soil pollution, destruction of forest) through word association test. The research questions were as follows:

- What are the cognitive structures of pre-service social studies teachers regarding environmental problems?
- What are the misconceptions of pre-service social studies teachers about environmental problems?

Methodology

Research Design

This study, the aim of which was to examine pre-service social studies teachers' cognitive structures and misconceptions about environmental problems, was a descriptive study and employed survey model. Karasar (2020) suggests that the purpose of a survey model is to provide an accurate representation of a current or past situation.

Participants

The participants of the study consisted of pre-service social studies teachers studying at Fırat University Faculty of Education in the 2021-2022 academic year. The participants were selected using convenience sampling method, which is one of the purposive sampling methods. Purposive sampling is a non-random sampling approach (Büyüköztürk, Kılıç Çakmak, Akgün, Karadeniz & Demirel, 2018, p. 92).

In convenience sampling, the researchers selects the participants who are nearby and easy to access, which can be advantageous for the study in terms of time and efficiency (Yıldırım & Şimşek, 2018). The reason for using convenience sampling method in the study was that the researcherss were able to access pre-service social studies teachers studying at Fırat University. A total of 143 pre-service teachers, including 1st, 2nd, 3rd and 4th grades, participated in the study. Demographic information of the participants is presented in Table 1.

Table 1. Demographic information of the participants

Gender	1. Grade	2. Grade	3. Grade	4. Grade	Total
Male	9	14	13	8	44 (%31)
Female	27	25	21	26	99 (%69)
Total	36 (%25)	39 (%27)	34 (%24)	34(%24)	143

Data Collection Tool

In the study, data were collected using word association test, which is one of the frequently used tools to reveal students' cognitive structures. The word association test is a method used to uncover the connections or associations established between different concepts. It is used to examine the cognitive structure and the connections between concepts in this structure, whether these connections are sufficient and significant, and to identify misconceptions and conceptual changes (Bahar, Johnstone & Sutcliffe, 1999; Bahar & Özatlı, 2003, p. 75; Atasoy, 2004).

In the study, the 5th Grade social studies textbook was used to identify key concepts of environmental problems. The data collection tool consisted of key concepts selected among the environmental problems that were aimed in "*disasters and environmental problems*" section in the book after expert opinion. The data collection

tool consisted of two parts: The first part aimed to obtain personal information (grade and gender) of the participants. In the second part, key concepts were given and space was left for students to use these key concepts in sentences. The form was prepared in way that each key concept was on one page. A sample page was as follows:

Air Pollution……

Air Pollution ……

.

.

The Sentence……

Data Collection Procedure

The data collection was conducted in person, through face-to-face interactions. Initially, the forms were distributed to the participants, who were then instructed to review them briefly. Next, the participants were requested to write down words that the key concepts in the form triggered in their minds and to use them in sentences. For a more detailed understanding, an example for a different topic was presented and the implementation phase was started. The participants were given one minute for each key concept to fill the form. They were asked to write down the words they associated with the key concepts. Furthermore, the students were asked to employ the key concepts in a sentence within the corresponding section to evaluate their knowledge of the concepts' appropriate meanings related to the subject content, identify any misconceptions, and determine if the words they provided were simply a result of a shallow connotation. (Nartgün, 2006). The data collection process took approximately 15-20 minutes.

Data Analysis

Descriptive analysis technique was used in the analysis of the data. Descriptive analysis involves analyzing qualitative data, identifying findings, and interpreting them based on a predetermined framework (Yıldırım & Şimşek, 2006).

The data collected through the word association test were examined by the researcherss and the answers associated with each key concept and the number of repetitions of these words were determined. Then, concept networks were generated in line with the cut-off point based on the number of repetitions. The concept networks consisted of answers that related to the key concepts in the predetermined cut-off points, as well as the relationships between them. In order to clearly reveal the cognitive structure between the concepts, the cut-off points (CN) technique introduced by Bahar, Johnstone, and Sutcliffe (1999) was used. Based on this technique, a predetermined number of the most frequently answered words for any given key concept in the word association test is used as the cut-off point. Responses with frequencies exceeding this threshold are listed in the first part of the concept network. The cut-off point is then lowered at fixed intervals, and this process is repeated until all key terms are incorporated into the concept network. Key concepts that arise in each cut-off point interval are reiterated as many times as the number of students in that interval. For example, key concepts that emerged in the 29-20 cut-off point range were expressed by students between 29 and 20. Related sentences were examined by the researcherss, categorized as sentences containing scientific information, sentences containing non-scientific or surface level information, and sentences containing misconceptions, and the number of repetitions was determined (Ercan, Taşdere, & Ercan, 2010). After the sentences were categorized, representative sentences for each category were presented.

It was ensured that every stage of the study was examined in several dimensions by an expert in the field of credibility. Key concepts and related sentences in the data collection tool were examined by two

different researcherss. In the analysis of the related sentences, a comparison was made in order to ensure the intercoder reliability. In this sense, the number of agreement/disagreement among the researcherss was determined and the reliability of the research was calculated. The reliability of the study was calculated based on the formula "reliability = number of agreement/total agreement + number of disagreements", which was found as 0.96 (Miles & Huberman, 1994/2019, p. 64).

For the study, ethical permission was obtained from Fırat University Social and Human Sciences Research Ethics Committee (10.03.2022 dated and 0517 numbered).

Findings

The findings are presented in tables and concept networks. In Table 2, the responses associated with the key concepts related to environmental problems, namely air pollution, erosion, water pollution, soil pollution and destruction of forest, and the number of repetitions of these words are presented.

Table 2. Responses and repetitions associated with key concepts

	Air Pollution	**Erosion**	**Water Pollution**	**Soil Pollution**	**Destruction of forest**
Acid rains	15	*	3	4	*
Afforestation	*	41	*	*	4
Agriculture	*	*	10	*	*
Air pollution	*	*	*	*	18
Animal waste	*	*	3	*	*
Atmosphere	26	*	*	*	3
Barren soil	*	*	*	57	*
Battery	*	*	*	15	*
Biological pollution	*	*	10	*	*
Black Sea	*	10	*	*	*
Carbon dioxide	22	*	*	*	10
Carelessness	*	*	*	*	8
Carrier bag	*	*	*	5	*
Central Anatolia	*	1	*	*	*
Chemical waste	*	*	28	26	*
Cigarette filters	*	*	*	*	9
Cigarette smoke	5	*	*	*	*
Climate change	6	*	*	*	7
Coal	15	*	*	*	*
Death	10	*	58	22	45
Decreased drinking water	*	*	18	*	*
Deforestation	*	7	*	*	49
deforestation	*	*	*	*	8
Degradation of biodiversity	*	*	*	*	21
Demolition	*	7	*	*	*
Desertification	*	10	4	*	7
Destruction of forests	*	14	*	*	*
Destruction of vegetation	*	28	*	*	*
Detergent	*	*	5	*	*
Disaster	*	21	*	*	2
Disease	*	*	*	11	*
Disruption of the food chain	*	*	1	5	*

Drought	3	20	8	11	15
Dust cloud	5	*	*	*	*
Ecological degradation	13	*	15	*	25
Epidemic diseases	4	*	30	*	*
Erosion	*	*	*	17	26
Excessive precipitation	*	37	*	*	*
Exhaust fumes	82	*	*	7	*
External forces	*	8	*	*	*
Factory chimneys without filter	85	*	*	*	*
Factory wastes	12	*	59	21	*
Fallow	*	5	*	*	*
Famine	*	6	6	17	*
Fertilizer	*	*	3	37	*
Fire making	*	*	*	*	23
Fish kill	*	*	24	*	*
Flood	*	13	*	*	4
Food problem	*	*	*	6	*
Forest fires	10	*	*	*	82
Fossil fuels	9	*	*	*	*
Furniture	*	*	*	*	3
Garbage	3	*	25	43	4
Glass waste	*	*	*	*	6
Global warming	10	*	4	*	6
Greenhouse gases	13	*	*	*	2
Harmful gases	17	*	*	*	*
Heavy metals	*	*	3	10	*
Hotel	*	*	*	*	6
Household waste	*	*	2	5	*
Hunger	*	*	*	8	*
Industrialization	19	*	*	*	*
Infertility of the soil	*	24	*	*	3
Insensitivity	*	*	2	5	*
Lack of security	*	*	*	*	5
Lake	*	*	11	*	*
Land slope	*	23	*	*	*
Landslide	*	2	*	2	9
Landslide	*	35	*	*	2
Loss of life	*	13	*	*	*
Loss of property	*	6	*	*	*
Mask	4	*	*	*	*
Mediterranean	*	*	*	*	4
Mucilage	*	*	26	*	*
Negligence	*	*	*	*	6
Nitrogen	5	*	*	*	*
Ocean	*	*	11	*	*
Oil	*	*	7	*	*
Oxygen loss	14	*	3	*	57
Ozone layer	20	*	*	*	2
Paper	*	*	*	*	5

People	7	*	12	21	15
Personal care products	27	*	*	*	*
Pesticides	*	*	7	41	*
Petroleum	2	*	9	2	*
Picnic	*	*	*	*	12
Plant	*	*	*	18	*
Plastic waste	*	*	12	23	*
Poor quality fuels	17	*	*	*	*
Population growth	1	*	4	2	*
Public transport	5	*	*	*	*
Radioactive waste	*	*	2	16	*
Reconstruction	*	*	*	*	15
Recycle	*	*	*	5	*
Respiratory diseases	60	*	*	*	7
Roughness	*	6	*	*	*
Sea	*	*	19	*	*
Sewage	*	*	6	7	*
Ships	*	*	3	*	*
Silent crisis	*	9	*	*	*
Soil barrenization	*	2	*	5	*
Soil erosion	*	27	*	*	*
Soil loss	*	89	*	24	*
Soil pollution	*	*	*	*	3
Solid waste	*	*	*	6	*
Stove	6	*	*	*	*
Stream	*	11	4	*	*
Stubble burning	*	3	*	4	9
Sweeping the soil	*	6	*	*	*
Temperature	*	2	*	*	4
Terror	*	*	*	*	5
Toxic substances	5	*	9	6	*
Traffic	5	*	*	*	*
Transport of soil	*	23	*	*	*
Treatment	*	*	12	*	*
Unconsciousness	*	*	6	*	15
Urbanization	2	2	3	1	7
Visual pollution	4	*	9	*	3
Waste	*	*	54	37	5
Water wars	*	*	6	*	*
Wind	*	20	*	*	*
Wood	*	*	*	*	7
Wrong Settlement	*	7	*	*	*
Total	**568**	**538**	**556**	**552**	**593**

The examination of the key concepts related to environmental problems showed that destruction of forest was associated with 47 responses, water pollution with 44 responses, air and soil pollution with 37 responses, and erosion with 34 responses. Key concepts were associated with a total of 123 responses, while 50 responses were associated with more than one key concept. Similarly, among the key concepts, the highest number of responses was associated with destruction of forest with 593 responses, followed by air pollution

with 568 responses, water pollution with 556 responses, soil pollution with 552 responses, and erosion with 538 responses. In terms of the responses with which the key concepts were most associated, erosion was associated with soil loss 89 times, air pollution with factory chimneys without filter 85 times, destruction of forest with forest fires 82 times, water pollution with factory wastes 59 times, soil pollution was associated with infertility of soil 57 times. Out of the total responses, 89 of them were repeated 10 times or more, whereas 14 responses were linked to more than one core concept, thus becoming a shared answer. Responses with 10 or more repetitions is shown in concept networks below.

Responses at 50 and Above Cut-off Points

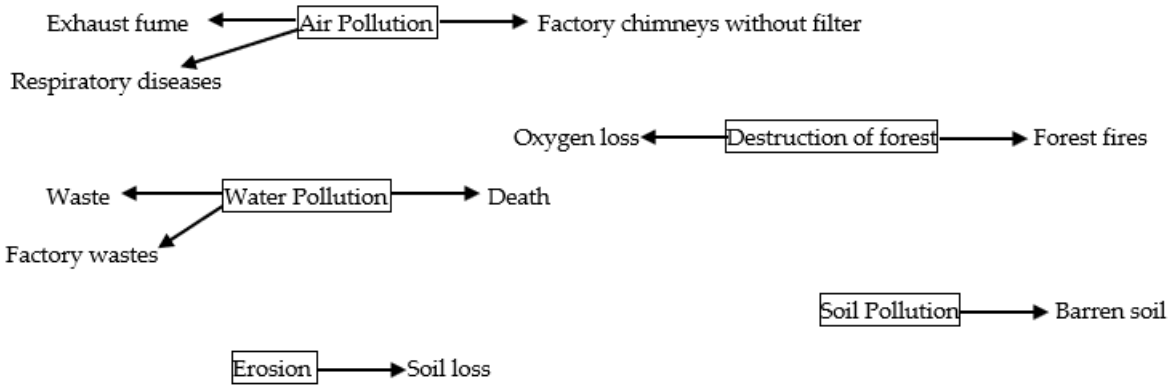

Figure 1. Concept Map of responses at 50 and above cut-off points

Figure 1 shows that air pollution was associated with *factory chimneys without filter*, *exhaust fumes* and *respiratory diseases*, destruction of forest with *oxygen loss* and *forest fires*, water pollution with *factory wastes*, *death* and *waste*, soil pollution with *barren soil*, and erosion with *soil loss*. There was no common response at this cut-off point.

Responses at 49-40 Cut-off Points

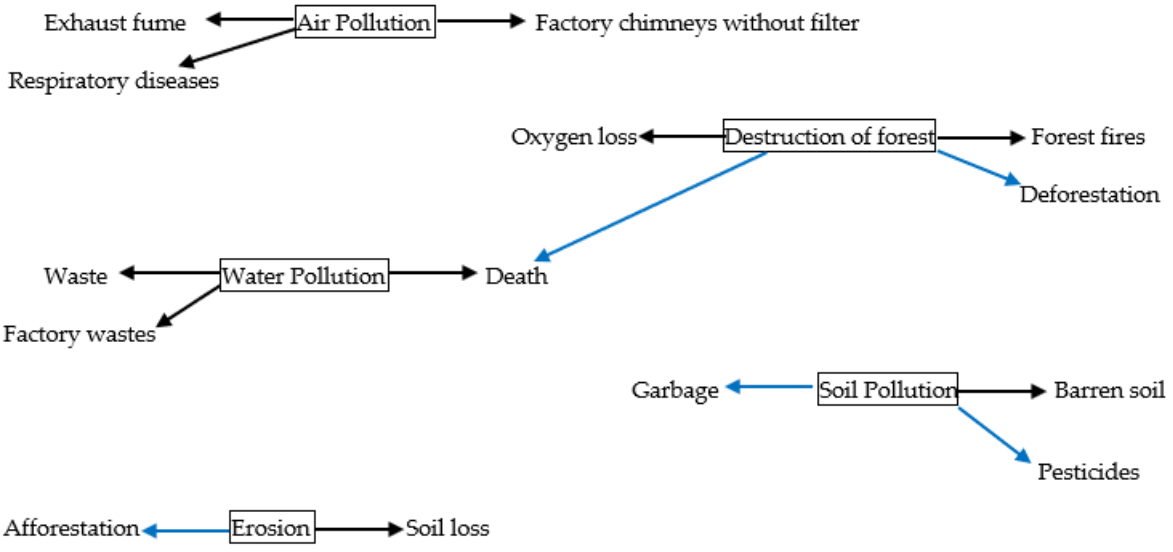

Figure 2. Concept Map of responses at 49-40 cut-off point

The destruction of forest, soil pollution and erosion were included in the 49-40 cut-off points. Destruction of forest was associated with *death* and *deforestation*, soil pollution with *garbage* and *pesticides*, erosion with *afforestation*. The response "death" was response, expressed for both destruction of forest and water pollution.

Responses at 39-30 Cut-off Points

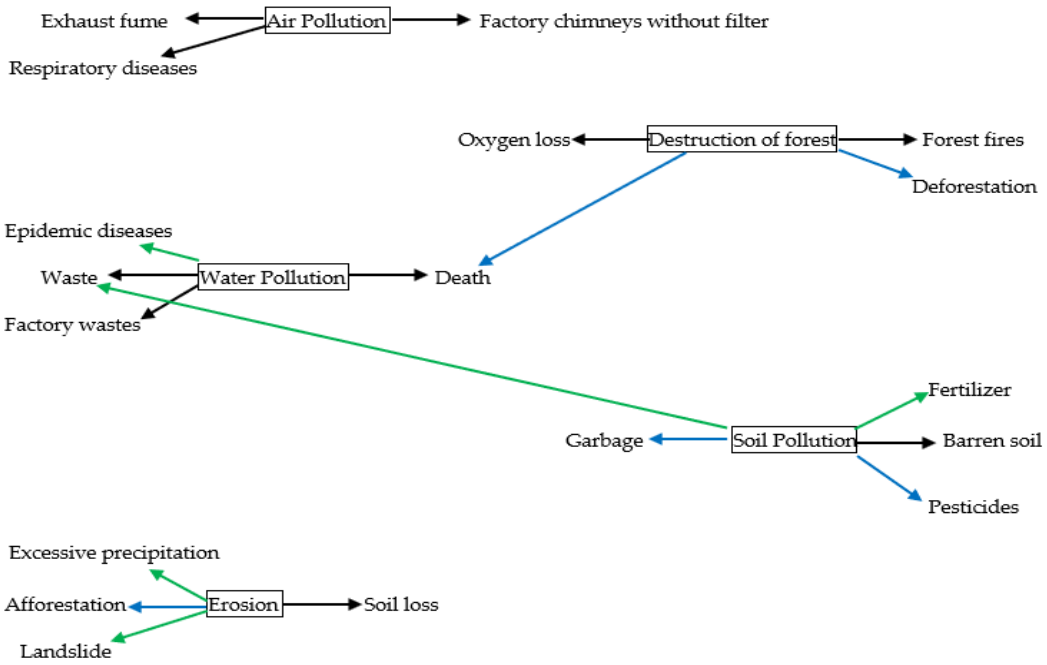

Figure 3. Concept Map of responses at 39-30 cut-off point

At this cut-off point, water pollution was associated with *epidemic diseases*, soil pollution with *fertilizers* and *waste*, erosion with *excessive precipitation* and *landslides*. It was found that air pollution and destruction of forest was not associated with any response. The response *waste* was associated with both soil pollution and water pollution. The responses *excessive precipitation* and *landslides* associated with the erosion at this cut-off point contained misconceptions.

Responses at 29-20 Cut-off Points

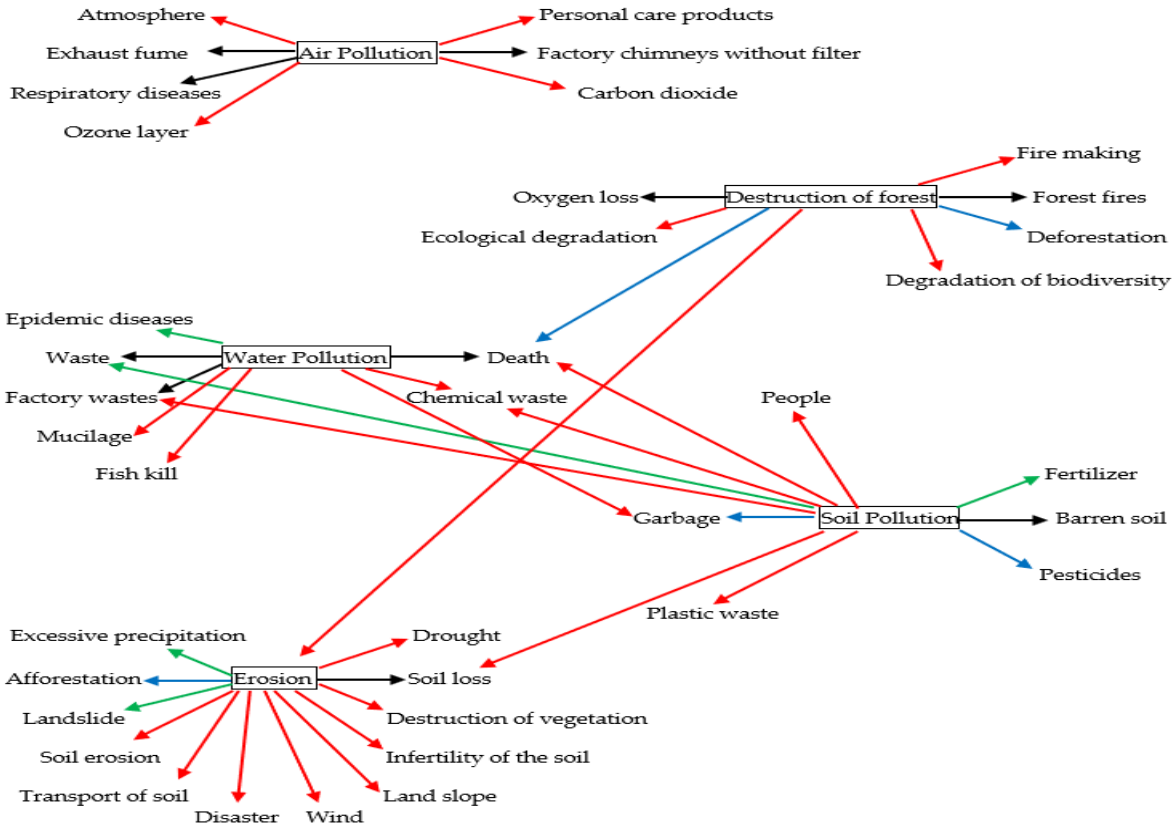

Figure 4. Concept Map of responses at 29-20 cut-off point

At this cutoff point, air pollution was associated with *personal care products*, *carbon dioxide*, *ozone layer* and *atmosphere*, destruction of forest with *fire making*, *ecological degradation*, *degradation of biodiversity*, and *erosion* which was another key concept. Water pollution was associated with *fish kill*, *chemical waste*, *mucilage* and *garbage*, soil pollution with *people*, *factory waste*, *death*, *chemical waste*, *plastic waste* and *soil loss*, erosion with *drought*, *destruction of vegetation*, *soil erosion*, *infertility of the soil*, *land slope*, *wind*, *disaster*, *transport of the soil*. The response *death* associated with water pollution and destruction of forest was associated with soil pollution at this cut-off point. The responses *chemical waste* and *factory waste* were associated with water pollution and soil pollution and thus becoming common response. In addition, the response *soil loss* associated with erosion was also associated with soil pollution. The response *land slope* associated with erosion at this cutoff point contained a misconception.

Responses at 19-10 Cut-off Points

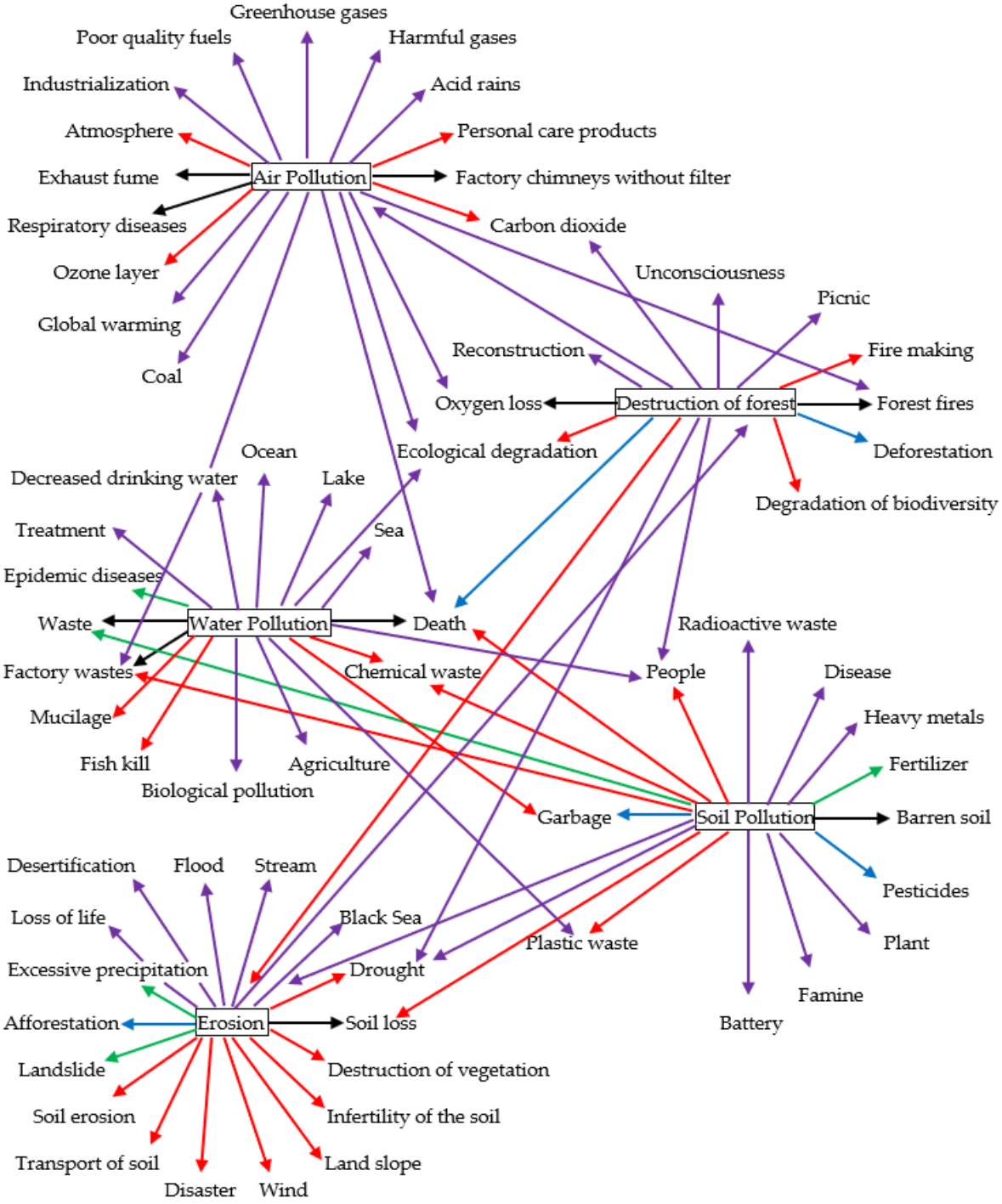

Figure 5. Concept Map of responses at 19-10 cut-off point

Although air pollution was associated with *industrialization*, *poor quality fuels*, *greenhouse gases*, *harmful gases*, *acid rain*, *global warming*, *coal*, *death*, *factory waste*, *ecological degradation*, *oxygen loss* and *forest fire*, destruction of forest was associated with *reconstruction*, *unconsciousness*, *picnic*, *people*, *drought*, *carbon dioxide* and *air pollution* which was another key concept. Similarly, while water pollution was associated with *sea*, *decreased drinking water*, *ocean*, *lake*, *treatment*, *ecological degradation*, *people*, *plastic waste*, *agriculture* and *biological pollution*, soil pollution was associated with *radioactive waste*, *disease*, *heavy metals*, *plant*, *famine*, *battery*, *drought* and *erosion* which was another key concept. Finally, erosion was associated with *loss of life*, *flood*, *stream*, *desertification*, *Black Sea* and *destruction of forest* which was another key concept. The responses *Black Sea* and *loss of life* contained misconceptions.

Death was associated with air pollution, water pollution, soil pollution and destruction of forest, *factory wastes* with soil pollution, water pollution and air pollution, *human* with water pollution, soil pollution and destruction of forest, *carbon dioxide*, *oxygen loss* and *forest fires* with air pollution and destruction of forest, *ecological degradation* with destruction of forest, air pollution and water pollution, *drought* with erosion, destruction of forest and soil pollution, and *plastic waste* with water pollution and soil pollution and thus they became the common answer.

Although there was no common response between the responses associated with water pollution and air pollution and those associated with erosion, an association was found between other key concepts. In addition, destruction of forest was associated with air pollution and erosion, erosion was associated with destruction of forest, and soil pollution with erosion.

Sentences Constructed for Key Concepts

The sentences for key concepts were divided into 3 different categories and the number of sentences in these categories was calculated for each key concept. Table 3 shows the categories and the number of the sentences.

Table 3. Categories and number of categories regarding key concepts

Key concepts	Sentences with scientific information	Sentences with non-scientific or surface level information	Sentences with non-misconceptions
Air Pollution	61	82	-
Erosion	56	50	31
Water Pollution	49	91	1
Soil Pollution	68	69	2
Destruction of forest	52	77	-

Although the number of sentences with non-scientific or surface level information in air pollution, water pollution and destruction of forest was greater than the number of sentences with scientific information, the numbers were comparable in erosion and soil pollution. The number of sentences with misconceptions was quite high in erosion. The other key concepts had no or very few sentences with misconceptions. Sentences constructed for the key concepts is shown in Table 4,

Table 4. Sample sentences for the key concepts

Key concepts	Sentences with scientific information	Sentences with non-scientific or surface level information	Sentences with non-misconceptions
Air Pollution	- Air pollution refers to an increase in the level and concentration of contaminants present in the air, beyond what is considered typical or expected.	- Air pollution is a main problem in the world. -The pollution of air, one of the sources of life, is a very significant disaster.	-

	- The use of substances causing harmful gases such as carbon dioxide leads to air pollution. - The use of fossil fuels instead of natural gas increases air pollution.	- It occurs as a result of unconscious actions of human. - Polluting the air is destroying the future. -Air pollution is increasing even more today. - It has negative effects on living beings.	
Erosion	- Erosion is the loss of the fertile part of the soil by wearing down in the earth's crust. - The destruction of vegetation that protects the soil leads to erosion. - Erosion is the process by which soil is displaced and transported away, or accumulated in a different location..	- It is harming the nature due to the irresponsible behavior of human. - The soil is damaged by our inappropriate activities. - Erosion is the worst enemy of the soil. - We lose our soil because of it.	- If we do not plant trees, landslides will occur, which in turn can result in loss of human life - if there is not absence of slope and afforestation, there will be landslides on the earth's crust. - It is observed in the Black Sea region in our country.
Water Pollution	- Water pollution is a problem due to human waste and harms the environment to a large extent, especially the animals living in the environment. - Disposal of waste into seas and rivers threatens the survival of marine life and their species. - Water pollution is observed in water basins such as lakes, rivers, oceans and seas and negatively affects living beings.	- Water pollution negatively affects existence of living organisms. - It refers to pollution in water. - For the continuation of life, we must pay attention to water pollution. - The water you have polluted today will be in your glass tomorrow. - Water pollution is a betrayal of future generations. - If we pollute the water, we will not be able to find water to drink. - In these days when the importance of water is increasing, we must be more careful and self-sacrificing..	-Chemical waste turns the formerly blue waters to become gray in color.
Soil Pollution	- Due to the unconscious use of the soil, pesticides and wastes, the percentage of soil yield decreases every year. - It refers to the decline in the physical and chemical properties of the soil. - Garbage and factory waste diminish the humus in soil. - The unconscious use of pesticides leads to soil pollution..	- Since we obtain everything from the soil, soil pollution can have catastrophic effects on various aspects of our lives. - Soil pollution is a significant environmental problem. - The most important cause of soil pollution is the unconscious behavior of people. - If we do not save our land now, it may be too late tomorrow.	- Soil pollution does not emerge due to the buffering property of the soil.

		- It refers to the disposal of harmful things into the soil.	
Destruction of forest	- Forests have highest biodiversity and are the oxygen stores of humans. -Damage to the forests may have detrimental effects on all living beings. - Forest fires occur due to glass waste left in forests. As a result, a large number of trees are lost and carbon dioxide is released. - Destruction of forests degrades biodiversity and destroys the habitat of living beings..	- Destructing forests is actually damaging our lungs. - Trees are cut down to make concrete everywhere. - Negligence and carelessness leads to deforestation. - Destruction of forests has detrimental effects for all living and non-living beings. - We should protect forests and plant trees. - We should not destroy forests in order to ensure a sustainable future.	-

In the sentences with scientific information category, the relationship of the sentences with key concepts and the fact that the information they contain were scientifically correct were taken into consideration. For example, as in the sentence "*Erosion is the process by which soil is displaced and transported away, or accumulated in a different location*.", the sentence for erosion was scientifically correct and related to the key concept.

The sentences with non-scientific or surface-level information were related to the key concept but were not scientific. Instead, they contained information used in daily life, and advice, suggestions and experience. For example, as in the sentence "*The pollution of air, one of the sources of life, is a very significant disaster*.", although the content is not incorrect, it contained information used in daily life and had no scientific information.

Finally, the sentences with misconceptions category consisted of sentences are related to another concept or are incorrect regardless of containing scientific information or non-scientific and surface-level information. For example, although the sentence "*If we do not plant trees, landslides will occur, which in turn can result in loss of human life,"* contained scientific information, the content was related "landslide", not "erosion".

Conclusion and Discussion

In this study, the aim of which was investigate the cognitive structures and misconceptions of pre-service social studies teachers about environmental problems, word association test was used to collect data. There were 5 key concepts in the WAT: air pollution, erosion, water pollution, soil pollution and destruction of forest. The participants associated the most responses with the key concept of destruction of forest, and it was found that the total number of responses related to this key concept was higher than those of other key concepts. This finding can be explained by the recent rise in forest fires in Turkey, along with the fact that this has been a matter of concern for a considerable period of time. The participants provided a wide variety of responses to key concepts regarding environmental problems and were able to form associations between them. It was found that among the responses, words such as factory chimneys without filter, exhaust fumes, soil loss, respiratory diseases, factory wastes and forest fires were the most frequent.

The cognitive structures of the participants regarding air pollution showed that air pollution was mostly associated with the responses such as exhaust smoke, factory chimneys without filter, respiratory diseases, personal care products and carbon dioxide. Similarly, Özel (2019) reported that air pollution was mostly caused by gases given off from factories and exhausts, and perfumes/deodorants. In addition, Taşbaş (2017) found that air pollution was associated with words such as smoke, factory, exhaust, carbon dioxide and

perfume. Yalvaç (2008) also revealed that pre-service teachers associated air pollution with words such as carbon dioxide, exhaust and smoke.

It was found that the participants mostly associated erosion with the responses such as soil loss, afforestation, excessive precipitation, landslide, destruction of vegetation, soil erosion, infertility of the soil, and land slope. In this sense, Kurt (2013) reported that erosion was associated with responses such as soil, rain, soil erosion, death and afforestation. Similarly, Yalvaç (2008) found that erosion was associated with soil loss, tree and desertification. In addition, Özgen (2013) stated that pre-service teachers expressed erosion as landslides and soil erosion. There were a large number of misconceptions in responses of the participants regarding this key concept. Özgen (2013) defines erosion as the condition of being carried away, worn down, or displaced from the location where the soil covering is formed, as a result of either natural or human factors. It was found that the participants mostly generated responses indicating the concept of landslide in erosion key concept, showing that they confused the concepts of erosion and landslide. Examples of responses that evoke the concept of landslide were excessive precipitation, landslides, land slope, Black Sea and loss of life.

The cognitive structures of the participants regarding water pollution revealed that the responses such as factory waste, death, waste, epidemic diseases, chemical waste, mucilage, fish kill, garbage were expressed. The response mucilage indicates that the participants were aware of current issues. In Yalvaç's study (2008), water pollution was associated with factory, garbage, death and disease. In addition, (2019) reported that such factors as littering in water, polluted water in industries, and damage to aquatic organisms were expressed as the causes and consequences of water pollution. Similarly, Taşbaş (2017) found that water pollution was associated with factory, fish kill, garbage and waste material.

The participants associated soil pollution with responses such as infertility of soil, garbage, pesticides, fertilizer, waste, plastic waste, factory waste, human, erosion. Similarly, Taşbaş (2017) found that the responses artificial fertilizers, pesticides, plastic and waste materials were associated with soil pollution. In addition, it was stated in Özel's study (2019) that soil pollution is caused by garbage and the soil loses its fertility due to soil pollution. Besides, Yalvaç (2008) reported that soil pollution was associated with garbage and waste.

The cognitive structures of the participants regarding destruction of forest revealed responses such as forest fires, oxygen loss, death, deforestation, degradation of biodiversity, ecological degradation, erosion, and air pollution. Similarly, Özel (2019) found that destruction of forest was caused by the cutting of trees and forest fires, leading to adverse effects on the organisms inhabiting the forest as well as a reduction in the levels of oxygen.

The participants' sentences regarding erosion showed that the number of sentences with scientific information was higher than the sentences with non-scientific or surface-level information, and the number of sentences with misconceptions was quite high. Similarly, Kurt (2013) reported it that the number of sentences with misconceptions in sentences regarding erosion was high. The number of sentences with scientific information in other key concepts was higher than the number of sentences with non-scientific or surface-level information. In addition, that there was no sentence with misconceptions regarding air pollution and destruction of forest, and there are few sentences regarding water and soil pollution.

In general, the cognitive structures of the participants about environmental problems showed that although they were able to associate air, water, soil pollution and destruction of forest with the related words, they failed to construct sufficient number of sentences with scientific information. In erosion, it was found that both the associated words and the sentences consisted of misconception. In addition, although the participants associated erosion with related words, their sentences contained misconceptions. In this sense, it can be concluded that the participants' cognitive structures regarding air, water, soil pollution and destruction of forests were at a moderate level and insufficient in terms of erosion.

Based on the results of the study, the following recommendations are put forward. It was found that participants confused the concepts of erosion and landslide. Previous studies reported similar findings. In future studies, cognitive structures and misconceptions of pre-service teachers or students at other levels regarding erosion can be investigated. Thus, in order to achieve a successful learning process, these two concepts can be compared and teaching activities can be carried out based on this comparison. In addition, the learning process should be supported with videos of these natural events in order to explain the concepts of erosion.

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Parents' Expectations from Mathematics Education: A Mixed Study

Research Article

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ABSTRACT

The purpose of this study is to identify the level of expectations held by parents of secondary school students, whether these expectations differ significantly across a range of variables, and to identify the expectations of parents regarding mathematics education, difficulties they run into, and solutions they suggest. Explanatory sequential design of mixed methodology was preferred in research. The quantitative study group consisted of 398 parents who had students in secondary schools in the central district of Sivas province during the spring term of the 2021-2022 academic year, while the qualitative study group consisted of 23 parents. The "Mathematics Education Parent Expectation Scale (MEPES)" developed by Aytekin et al. (2016), and a semi-structured interview form prepared by the researchers were used to collect research data. Descriptive statistics, independent groups t-test, one-way analysis of variance (ANOVA), and content analysis method were used to analyse the obtained data. The research has shown that parents' expectations are "very high" in the factors of "Expectation of Teaching for Conceptual Understanding and Active Student (ETCUAS)" and "Expectation of Donating Positive Attitude and Behaviour (EDPAB)", and "high" in the factor of "Expectation of an Authoritative and Rule Weighted Teaching (EARWT)", and on the whole scale. There was a statistically significant difference in the parents' expectations levels on the EARWT factor based on the gender variable; and on the whole scale and its factors based on the educational status variable, and no statistically significant difference was found in the expectation levels of the parents on the whole scale and its sub-factors according to the student's gender and grade level. The qualitative findings revealed that the most common expectation from mathematics education is for it to be relevant to daily life; the most common difficulty is passing over topics that are beyond the students' grasp; and the most frequent suggestions are to ensure active participation and to cover topics in greater depth.

Keywords:
Mathematics education, expectation, parent

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Introduction

Mathematics is a vital component of all academic fields and occupies a significant position within sciences. Mathematics is a universal and common language for all sciences and generally defined as a measurement process, calculation technique, an art of reasoning, or a discipline (Işık et al., 2008). Individuals and societies need the universal language of mathematics in order to acquire and adapt the scientific thinking skills required by the age. Math is crucial to human and social life because it enables us to think critically, engage in debate, and reach judgments. It also enables us to create the necessary inventions to control natural events and to explain the fundamental structural underpinnings of future scientific discoveries (Altun, 2006). Countries across the globe want to train students with the necessary mathematical background and skills to increase their competitiveness in science, technology, engineering, and mathematics. Over this, many nations regularly identify areas that call for coordinated action, implement the necessary changes to curriculum elements, and evaluate students' mathematical proficiency through programs.

In 2018, in Turkey, the Turkish mathematics curriculum was updated by the Ministry of National Education (MONE) in accordance with the age-appropriate requirements. The primary goals of mathematics education for students were expressed as developing mathematical literacy skills, comprehending and applying mathematical concepts in daily life, using reasoning in the problem-solving process, and consciously managing one's own learning processes. The curriculum's perspective was described as cultivating lifelong learners who use higher cognitive abilities like analysing, creating, and evaluating (MONE, 2018a).

Various measurement tools are used to assess the effectiveness of education systems in relation to the goals set. Turkey also participates in a number of international programs to compare its educational performance to that of other countries. Every three years, the Organization for Economic Cooperation and Development (OECD) administers the Program for International Student Assessment (PISA), which consists of questions on reading comprehension, mathematics, and science literacy, to assess the extent to which 15-year-old students have attained the skills and knowledge required for success in contemporary societies and economies (She et al., 2018). The mathematical literacy domain of PISA is concerned with students' ability to analyse, reason, and effectively communicate their ideas when formulating and interpreting mathematics in a variety of situations. Mathematical literacy is focused on the functionality and use of what you learn in school. The applications of mathematics in everyday life are based on skills learned and applied through the types of problems encountered in textbooks and classrooms (de Lange, 2006). For students to succeed in the modern information society, they need to have this functionality. With an average score of 454, Turkey was ranked 42nd out of 79 nations in the mathematics domain of the 2018 PISA exam. Despite moving up seven spots from the 2015 exam results, Turkey's mathematics performance was still below the OECD average (OECD, 2015; OECD, 2018).

Similar results are also revealed by national exams that are used to assess students' levels of goal achievement and to decide which students to admit to higher education institutions. The 2023 Education Vision, which was released in 2018 in conjunction with the Transition System to High Schools (TSHS), aims to measure the skills that the questions to be asked in the central exams; reasoning, critical thinking, interpretation, estimation, and similar cognitive skills, and it stressed that storing information and memorizing formulas will be prevented (MONE, 2018b). Mathematics, on the other hand, has the lowest average number of correct answers among TSHS subtests with twenty questions (MONE, 2022). It was reported that in 2022, the average number of mathematics questions with the correct answer was 4.74, down from 11.14 in 2019. This demonstrates that, since 2019, the average number of correct answers in mathematics has gradually decreased (MONE, 2019; MONE, 2020; MONE, 2021; MONE, 2022). It is evident from the exam results that Turkish students struggle in the domain of mathematics in both international and national exams and are unable to

develop the mathematical competence and skills, the significance of which is emphasized in the curriculum and vision documents.

There could be a variety of reasons why the desired outcomes in the curriculum and vision documents are not met, as well as why students fail mathematics exams. Variables that are thought to be related to mathematics achievement from the perspectives of both teachers and students have been discussed in various studies. These variables include students' enthusiasm for mathematics, their interest and self-confidence in mathematics, as well as their home and school environments (Ertürk & Akan, 2018), abilities and attitudes, socio-economic levels, gender (Thomson et al., 2003), time devoted to information and communication technologies (Özkan, 2022), as well as individual differences such as intelligence, anxiety, infrastructure; educational status and profession of parents, methods-techniques used by teachers, content knowledge, teaching proficiency, classroom management, communication skills and assignments, intensive curriculum that is not suitable for all students' needs, physical facilities such as class size, time devoted to study and problem solving (Cumhur, 2018; Okatan & Tomul, 2021; Yayla & Bangir-Alpan, 2019). When the literature is examined, it is clear that various studies have been conducted in order to find solutions to mathematics-related challenges and to improve the mathematics achievement of students. Studies on how to improve mathematics achievement recommended extending the duration of courses (Akbaş, 2018), setting up extra study sessions for students, upgrading school buildings, and facilitating areas where math is applied (Yurtbakan et al., 2016), using alternative assessment methods (Birgin & Baki, 2009; Yıldız & Uyanık, 2004) as well as effective teaching methods (Dağdelen & Ünal, 2017; Yenilmez & Duman, 2008), and using technology more frequently for educational purposes (İnan & Bekler, 2014), which are basically associated with teachers' professional development, updating curriculum, and improving schools' physical facilities.

In addition to these factors, parents' attitudes toward education, mathematics, and studying in general can be regarded as the most important factor in children's educational success (Muir, 2009). If parents interact with their kids in a sensitive way, look out for their academic development, assist with schoolwork when required, offer learning opportunities and resources, and motivate them to participate in learning-related activities, this will support their academic development (Wang et al., 2021). Although the studies with parents on mathematics education in Turkey were focused on parents' experiences in mathematics learning process (Temur & Korkmaz, 2021), their perspectives on different methods and techniques used in mathematics classes (Aktan & Budak, 2021; Poçan et al., 2021), their participation in their children's mathematics learning processes (Aksu & Topal, 2012; Bozkurt & Dülger, 2021; Doğan, 2021; Yenilmez, 2006), and their opinions on mathematics homework and curriculum (Erdoğan, 2020; Kaplan, 2018; Kay, 2007; Kay & Halat, 2009), parents are often ignored in efforts to improve mathematics education, and it is generally left up to educators and other professionals to decide how mathematics education will take place (Peressini, 1998). However, it is acknowledged that parents' attitudes influence their children's attitudes toward mathematics and that parents' expectations and beliefs about mathematics predict students' success in mathematics (Balli et al., 1998; Sheldon & Epstein, 2005).

Upon reviewing the literature, there are studies looking at what students expect from mathematics education (Duruhan et al., 1990; Gökbulut et al., 2008; Keşan et al., 2016; Memnun & Akkaya, 2010; Zakiroğlu, 2012), but there are few studies examining parents' expectations from mathematics education (Aytekin et al., 2016; Deringöl, 2019). Teachers, students, and parents are the key stakeholders who make up the current educational system, ensure its continuity, and significantly contribute to its success (Deringöl, 2019). Each stakeholder in the education system must work together for shared goals throughout the learning process in order to achieve the desired level of success. Parents, in particular, should be involved in their children's education. Parents need to have expectations for their kids' education, communicate with the school,

participate in extracurricular activities, and support their kids' learning in order to be an effective part of their kids' education (Aksu & Topal, 2012).

One of the key elements in achieving the goal of education and improving its quality is ensuring teacher, student, and parent interaction during the educational process. Students' learning processes will be shaped as a result of this process, which involves working with education stakeholders to identify shared needs and expectations. As is well known, family involvement in education increases students' academic success and supports students' positive behaviour during classes. The expectations of both parents and students in the educational process must be understood for this reason, and it is important to pay attention to both sets of expectations.

Purpose of the Research

The purpose of this study is to identify the level of expectations held by parents of secondary school students, whether these expectations differ significantly across a range of variables, and to identify the expectations of parents regarding mathematics education, difficulties they run into, and solutions they suggest. The answers to the following questions were sought for this purpose.

Problem Statement for the Quantitative Dimension of the Study

Does the level of expectation for mathematics education among parents of middle school students differ significantly in terms of various variables?

Sub-Problems in the Quantitative Dimension of the Research

- What are the expectations levels of parents regarding mathematics education?
- Does gender variable make a significant difference on the mathematics expectations of parents?
- Does the educational status variable make a significant difference on the mathematics expectations of parents?
- Does the gender variable of the student make a significant difference on the mathematics education expectations of parents?
- Does the grade variable of the student make a significant difference on the mathematics education expectations of parents?

Problem Statement for the Research's Qualitative Dimension

What are the perspectives of parents of middle school students on the expectations of mathematics education, the difficulties they face in the process, and the solutions they suggest?

Sub-Problems in the Research's Qualitative Dimension

- What are the expectations of parents of middle school students in terms of mathematics education? Why?
- What are the perspectives of parents of middle school students on the difficulties they face when their expectations for mathematics education are considered?
- What are the suggestions of parents of middle school students for the difficulties they encounter in light of the expectations for mathematics education?

Methodology

This chapter contains information about the research model, study group, data collection tools, and data analysis.

The Research Model

The mixed method, which combines quantitative and qualitative research methods, was chosen for the study, and an explanatory sequential design was used. The research therefore began with a quantitative phase and went on to include a qualitative phase to explain the quantitative findings (Creswell, 2017).

The Study Group

The sample for the quantitative dimension of the research is made up of 398 parents of students in middle schools in the central district of Sivas province during the spring term of the 2021-2022 academic year. Table 1 shows personal information of the parents participated in the quantitative dimension of the study.

Table 1. Personal information of the parents participated in the quantitative dimension of the study

Variables		f	%
Gender	Female	261	65.6
	Male	137	34.4
Educational Status	Primary school	112	28.2
	Middle school	94	23.6
	High school	106	26.6
	University	86	21.6
Student's Gender	Female	228	57.3
	Male	170	42.7
Student's Grade Level	5th grade	101	25.4
	6th grade	77	19.4
	7th grade	110	27.6
	8th grade	110	27.6
Total		398	100

According to Table 1, 65.6% of the parents participating in the study are female, while 34.4% are male. A total of 28.2% of the parents completed primary school, followed by 23.6% who completed middle school, 26.6% who completed high school, and 21.6% who completed a university degree. When we look at the factors relating to the middle school students of parents, we see that 57.3% of the student were female and 42.7% were male. We also see that 25.4% of the students are in the 5th grade, 19.4% are in the 6th grade, 27.6% are in the 7th grade, and 27.6% are in the 8th grade.

23 parents of middle school students in the province of Sivas central district during the academic year 2021–2022, make up the study group for the qualitative dimension of the research. In sample selection, the maximum diversity sampling method was used by reaching out to parents from various educational backgrounds and students from various grade levels, and participation in the research was voluntary. Table 2 contains personal information of the parents participated in the qualitative dimension of the study.

Table 2. Personal information of the parents participated in the qualitative dimension of the study

Variables		f	%
Gender	Female	14	60.9
	Male	9	39.1
Educational Status	Primary school	5	21.7
	Middle school	2	8.7
	High school	6	26.1
	University	10	43.5
Student's Gender	Female	17	73.9
	Male	6	26.1
Student's Grade Level	5th grade	7	30.4
	6th grade	4	17.4
	7th grade	5	21.8
	8th grade	7	30.4
Total		23	100

Table 2 shows that 60.9% of the parents are female, while 39.1% are male. Among the parents, 21.7% completed primary school, 8.7% finished middle school, 26.1% completed high school, and 43.5% completed a university. When we look at the factors relating to the middle school students of parents, we find that 26.1% of them were male and 73.9% of them were female. We also see that 30.4% of them were in the 5th grade, 17.4% in the 6th grade, 21.8% in the 7th grade, and 30.4% in the 8th grade.

Data Collection

Data collection tools for quantitative and qualitative dimensions were prepared in order to collect research data. A two-part form was used for the quantitative dimension of the research. The first part of the form contains questions about the parents' personal information, and the second part contains items from the "Mathematics Education Parent Expectation Scale (MEPES)" developed by Aytekin et al. (2016). There are a total of 15 items and three factors in the scale: "Expectation of Teaching for Conceptual Understanding and Active Student", "Expectation of Donating Positive Attitude and Behaviour", and "Expectation of an Authoritative and Rule Weighted Teaching". Items on the scale were rated as "Very high=5", "High=4", "Medium=3", "Low=2", and "Very low=1" using a five-point Likert scale. The range of scores assigned to the items for the interpretation of the scores obtained from the overall scale and its factors was determined as follows: between 1.00-1.80 as "Very low", between 1.81-2.60 as "Low", between 2.61-3.40 as "Medium", between 3.41-4.20 as "High", and between 4.21-5.00 as "Very high".

As a result of the Exploratory Factor Analysis (EFA); the total variance explained 62.3% of the whole scale, 35.8% of the ETCUAS factor, 16.5% of the EDPAB factor, and 10.1% of the EARWT factor; it is seen that the factor loading values of the scale vary between .56 and .86. As a result of Confirmatory Factor Analysis (CFA), the fit index values of the model obtained were $X^2/sd=2.52$, RMSEA=.069, GFI=.93, AGFI=.89, CFI=.94, NFI=.91, NNFI=.93, IFI=.94, PGFI=.63, and PNFI=.77. In order to determine the reliability of the scale, the internal consistency (Cronbach alpha) reliability coefficients were checked and it was calculated as .84 for the whole scale, .83 for the ETCUAS factor, .89 for the EDPAB factor, and .79 for the EARWT factor.

The researchers prepared a semi-structured interview form with two parts to use in the qualitative dimension of the research. While there are questions about the parents' personal information in the first part of the interview form, there are three open-ended questions in the second part to determine the parents' expectations about mathematics education, the difficulties they encounter in the process, and suggestions to these difficulties.

The approval of the ethics committee, which is required for the use of quantitative and qualitative data collection tools, was first obtained (Sivas Cumhuriyet University Scientific Research and Publication Ethics Social and Human Sciences Board, Date: 02.04.2021, Number: E-60263016-050.06.04-29054).

Data Analysis

The data analysis process is explained separately for the quantitative and qualitative dimensions under this title. The quantitative data was analysed using the SPSS 23 package program. To determine the parents' perspectives on the MEPES factors, descriptive statistics (arithmetic mean and standard deviation) were used. The independent groups t-test was used to compare the gender variable of parents and students; the one-way analysis of variance (ANOVA) test was used to compare the variables of educational status and grade level. The analysis of the data was conducted with a level of significance of.05. Loss and extreme value analysis were completed prior to the analysis of the quantitative data. Consequently, 398 data were used in the analysis of the data. Following that, it was examined if the data had a normal distribution and if the variances met the homogeneity assumption. The analysis revealed that the data met the assumption of normality and did not deviate significantly from the normal distribution. Because the assumption of variance homogeneity in terms of parent and student gender was provided, the independent groups t-test was chosen. In terms of educational

status and grade level variables, whether or not the homogeneity assumption of variances required for one-way analysis of variance (ANOVA) is provided is effective in the selection of the multiple comparison (post-hoc test) test (Büyüköztürk, 2013; Kayri, 2009). In this framework, the analysis of the education status variable was conducted under the presumption of homogeneity of variances, excluding the EARWT factor, and the Scheffe test, one of the post-hoc tests, was preferred to determine which groups differed from one another. The Dunnet-C test, one of the post-hoc tests, was used because the assumption of variance homogeneity could not be met in the EARWT factor based on educational status.

To analyse qualitative data and model the results, the NVIVO-10 program was employed. The data were analysed using a content analysis method. The data were first individually examined by the researchers, after which they combined their findings and evaluated them. Using the Miles and Huberman (2016) formula for the researchers' analyses, the reliability of the qualitative analysis was also calculated, and this value was found to be 97%. According to Miles and Huberman (2016), a calculated reliability of more than 90% is sufficient for the research's reliability. Following a review of the codes and themes developed, they were presented to a faculty member who is an expert in the field of Educational Sciences for expert opinion, and the necessary arrangements were made in accordance with the expert opinion. Furthermore, direct quotations that are the source of the model and findings obtained as a result of the analysis are presented under the heading of findings and interpretation. Given the importance of personal privacy, direct quotations were written as P10-F-5-U ("P10" = Parent-10, "F" = Female, "5" = Grade level of the student-5th grade, "U" = University graduate).

Findings

"Findings on the Quantitative Dimension" and "Findings on the Qualitative Dimension" are presented separately in this section.

Findings on the Quantitative Dimension

Under this title, the following findings are given: first, the findings related to the items of the MEPES findings related to its factors, namely ETCUAS, EDPAB and EARWT, and then the findings of the examination of MEPES and its factors in terms of determined variables (gender, educational status of the parents, the gender of the student, and the grade level of the student).

Findings on the Items of the MEPES

The results of the arithmetic mean and standard deviation of the items of the MEPES are given in Table 3.

Table 3. The results of the arithmetic mean and standard deviation of the items of the MEPES

Factor	No	Items	$\overline{X}$	sd
ETCUAS	1	I expect to be taught how mathematics is used in other fields.	4.16	.79
	2	In order for my child to better understand mathematics topics, I expect relationships between topics to be taught as well.	4.44	.68
	3	I want my child to be taught the logic of the subject, even if it takes time, instead of operations that he does not know the meaning of.	4.60	.63
	4	I expect my child to be taught the connection with everyday life while learning mathematics.	4.16	.89
	5	I expect my child to find different solutions and be supported.	4.56	.67
	Total		**4.38**	**.49**
EDPAB	6	I expect the mathematics teacher to give my child thinking methods that will enable them to make smarter decisions in life.	4.54	.68
	7	I expect the mathematics teacher to give my child a sense of responsibility.	4.40	.76

	8	I expect the mathematics teacher to teach my child to be systematic.	4.37	.78
	9	I expect the mathematics teacher to teach my child to be careful.	4.57	.64
	10	I expect the mathematics teacher to teach my child to be patient.	4.24	.98
	Total		**4.42**	**.52**
EARWT	11	I expect the mathematics to be taught as a subject in which the students generally listen to the teacher silently.	4.00	1.28
	12	I expect the mathematics to be taught as a subject where the teacher mostly writes on the board and solves problems.	3.59	1.32
	13	I expect mathematics courses to give the ability to make quick transactions instead of teaching them why the transactions are done the way they are.	3.68	1.24
	14	Instead of learning mathematics in depth, I expect my child to learn mathematics to a degree that will successfully complete his education life.	3.65	1.26
	15	I expect the teacher to use the smart board to quickly solve and pass the problems during problem solving.	3.62	1.29
	Total		**3.71**	**.83**
Overall Scale			**4.17**	**.42**

When looking at Table 3, the items of ETCUAS factor "In order for my child to better understand mathematics topics, I expect relationships between topics to be taught as well" ($\overline{X}$ = 4.44), "I want my child to be taught the logic of the subject, even if it takes time, instead of operations that he does not know the meaning of" ($\overline{X}$ = 4.60), "I expect my child to find different solutions and be supported" ($\overline{X}$ = 4.56) "very high" level items; "I expect to be taught how mathematics is used in other fields" ($\overline{X}$ = 4.16), and "I expect my child to be taught the connection with everyday life while learning mathematics" ($\overline{X}$ = 4.16) are seen to be adopted at the "high" level. The total arithmetic mean of the ETCUAS factor was found to be at the level of "very high" ($\overline{X}$ = 4.38). This finding indicates that "Expectation of Teaching for Conceptual Understanding and Active Student" are very highly adopted by the parents.

When EDPAB factor is examined, the items "I expect the mathematics teacher to give my child thinking methods that will enable them to make smarter decisions in life" ($\overline{X}$ = 4.54), "I expect the mathematics teacher to give my child a sense of responsibility" ($\overline{X}$ = 4.40), "I expect the mathematics teacher to teach my child to be systematic" ($\overline{X}$ = 4.37), "I expect the mathematics teacher to teach my child to be careful" ($\overline{X}$ = 4.57), "I expect the mathematics teacher to teach my child to be patient" ($\overline{X}$ = 4.24) are seen to be adopted at the "very high" level. The total arithmetic mean of the EDPAB factor was found to be at the level of "very high" ($\overline{X}$ = 4.42). This finding can be interpreted as the parents' views on the "Expectation of Donating Positive Attitude and Behaviour" factor is very high.

Considering EARWT factor; the items "I expect the mathematics to be taught as a subject in which the students generally listen to the teacher silently" ($\overline{X}$ = 4.00), "I expect the mathematics to be taught as a subject where the teacher mostly writes on the board and solves problems" ($\overline{X}$ =3.59), "I expect mathematics courses to give the ability to make quick transactions instead of teaching them why the transactions are done the way they are" ($\overline{X}$ = 3.68), "Instead of learning mathematics in depth, I expect my child to learn mathematics to a degree that will successfully complete his education life" ($\overline{X}$ = 3.65), "I expect the teacher to use the smart board to quickly solve and pass the problems during problem solving" ($\overline{X}$ = 3.62) items are seen to be adopted at the "high" level. When the total arithmetic mean of the EARWT factor is examined, it was determined that

it was at the level of "high" ($\overline{X}$ =3.71). This finding can be interpreted as the parents' views on the "Expectation of an Authoritative and Rule Weighted Teaching" factor being high.

Finally, the parents' expectations for mathematics education are at a "high" level, according to the analysis of the MEPES's total arithmetic mean ($\overline{X}$ =4.17).

Findings on MEPES and Its Factors by Gender Variable

Table 4 displays the independent groups t-test results for the MEPES and its factors based on the gender variable.

Table 4. The independent group t-test results for MEPES and its factors based on gender

Scale and Factors	Gender				Levene test		df	t	p
	Female (n=261)		Male (n= 137)		F	p			
	$\overline{X}$	sd	$\overline{X}$	sd					
ETCUAS	4.39	.50	4.37	.48	.010	.920	396	.442	.658
EDPAB	4.42	.54	4.44	.50	1.328	.250	396	-.460	.646
EARWT	3.79	.81	3.54	.86	1.917	.167	396	2.869	.004*
Overall Scale	4.20	.43	4.12	.41	1.351	.246	396	1.857	.064

*p<.05

Table 4 shows that there is a statistically significant difference in favour of female parents between the opinions of the parents according to the gender variable in the EARWT factor [t_{396}= 2.869; p<.05]. According to the arithmetic mean, both female and male parents' opinions are "high" in the EARWT factor. There is no statistically significant difference in parental views based on gender for the ETCUAS, EDPAB, and the whole scale [t_{396}= .442 for ETCUAS, t_{396}= -.460 for EDPAB, t_{396}= 1.857; p>.05 for the whole scale]. According to the arithmetic mean, both female and male parents' opinions are at the "very high" level in the ETCUAS and EDPAB factors, and at the "high" level for the whole scale, but this does not create a significant difference between the groups.

Findings on MEPES and Its Factors by Education Status Variable

Table 5 displays the one-way analysis of variance (ANOVA) test results for the MEPES and its factors based on the education status variable.

Table 5. The one-way analysis of variance (ANOVA) test results for MEPES and its factors based on education status

Scale and Factors	Education Status	n	$\overline{X}$	sd	Source of Variance	Sum of Ranks	df	Mean Rank	F	p	Scheffe
ETCUAS	Primary school (1)	112	4.32	.52	Between groups	2.368	3	.789	3.338	.019*	1-4
	Middle School (2)	94	4.34	.50	Within groups	93195	394	.237			
	High school 3)	106	4.37	.44	Total	95.564	397				
	University (4)	86	4.53	.47							
	Levene 1.322	p=.267									
EDPAB	Primary school (1)	112	4.42	.53	Between groups	2.524	3	.841	3.112	.026*	2,3-4
	Middle School (2)	94	4.36	.52	Within groups	106.534	394	.270			
	High school 3)	106	4.37	.54	Total	109.059	397				
	University (4)	86	4.57	.48							
	Levene 1.135	p=.335									
EARWT	Primary school (1)	112	4.04	.57	Between groups	34.194	3	11.39	18.587	.000*	1,2-3
	Middle School (2)	94	3.89	.74		241.606	394	8			1,2-4
	High school 3)	106	3.53	.84		275.800	397	.613			

	University (4)	86	3.29	.97	Within groups						
	Levene 9.712	p=.000			Total						
Overall Scale	Primary school (1)	112	4.26	.41	Between groups	1.883	3	.628	3.588	.014*	1-3
	Middle School (2)	94	4.20	.43	Within groups	68.922	394	.175			
	High school 3)	106	4.09	.43	Total	70.805	397				
	University (4)	86	4.13	.41							
	Levene .269	p=.848									

*p<.05

When Table 5 is examined, a statistically significant difference between parents' opinions based on the variable of educational status in MEPES and its factors can be seen [F_{3-394}= 3.338 for ETCUAS, F_{3-394}= 3.112 for EDPAB, F_{3-394}= 18.587 for EARWT, F_{3-394}= 3.588 for the whole scale; p<.05]. The opinions of parents who have completed primary school ($\overline{X}$ =4.32), middle school ($\overline{X}$ =4.34), high school ($\overline{X}$ =4.37), and university ($\overline{X}$ =4.53) are seen to be at a "very high" level in the ETCUAS factor when the arithmetic means are examined. As a result of the Scheffe test, it is seen that the difference between groups in the ETCUAS factor is in favour of university graduate parents among primary school and university graduate parents. It is seen that the opinions of parents who graduated from primary school ($\overline{X}$ =4.42), middle school ($\overline{X}$ =4.36), high school ($\overline{X}$ =4.37), and university ($\overline{X}$ =4.57) in the EDPAB factor are at "very high" level. As a result of the Scheffe test, it is seen that the difference between groups in the EDPAB factor is in favour of university graduate parents among middle, high, and university graduate parents. It is seen that the views of primary school ($\overline{X}$ =4.04), middle school ($\overline{X}$ =3.89), and high school ($\overline{X}$ =3.53) graduates are at the "high" level, while the opinions of the university graduates ($\overline{X}$ =3.29) are at the "moderate" level in the EARWT factor. As a result of the Dunnet-C test, it is seen that the difference between groups in the EARWT factor is in favour of primary and middle school graduate parents among primary and middle school graduate parents and high school graduate parents, and between primary and middle school graduate parents and university graduate parents in favour of primary and middle school graduate parents. In the whole scale, it is seen that primary school graduate ($\overline{X}$ =4.26) parents' opinions are at the "very high" level whereas middle school ($\overline{X}$ =4.20), high school ($\overline{X}$ =4.09), university graduates ($\overline{X}$ =4.13) parents' opinions are at the "high" level. As a result of the Scheffe test, it is seen that the difference between the groups in the whole scale is in favour of primary school graduate parents between primary school and high school graduate parents.

Findings on MEPES and ıts Factors by Student's Gender Variable

Table 6 displays the independent groups t-test results for the MEPES and its factors based on the student's gender variable.

Table 6. The independent group t-test results for MEPES and its factors based on student's gender

Scale and Factors	*Student's Gender*				*Levene test*		*df*	*t*	*p*
	Female (n=228)		*Male (n= 170)*		*F*	*p*			
	$\overline{X}$	*sd*	$\overline{X}$	*sd*					
ETCUAS	4.40	.49	4.36	.49	.572	.450	396	.846	.398
EDPAB	4.46	.53	4.38	.52	.166	.684	396	1.424	.155
EARWT	3.75	.80	3.65	.88	3.551	.060	396	1.216	.225
Overall Scale	4.20	.41	4.13	.43	.670	.414	396	1.720	.086

When Table 6 is examined, it is seen that there is no statistically significant difference between the views of parents according to the variable of student's gender in MEPES and its factors [t_{396}= .846 for ETCUAS, t_{396}= 1.424 for EDPAB, t_{396}= 1.216 for EARWT, t_{396}= 1.720 for the whole scale; p>.05]. Considering the arithmetic means, the opinions of parents who have both female and male students are at the "very high" level in the ETCUAS and EDPAB factors, and "high" in the whole scale and in the EARWT factor, but this does not create a significant difference between groups.

Findings on MEPES and ıts Factors by Grade Level Variable

Table 7 displays the one-way analysis of variance (ANOVA) test results for the MEPES and its factors based on the grade level variable.

Table 7. The one-way analysis of variance (ANOVA) test results for MEPES and its factors based on grade level

Scale and Factors	Student's Grade Level	n	$\overline{X}$	sd	Source of Variance	Sum of Ranks	df	Mean Rank	F	p
ETCUAS	5th Grade	101	4.38	.49	Between groups	.021	3	.007	.029	.993
	6th Grade	77	4.38	.44						
	7th Grade	110	4.38	.53	Within groups	95.542	394	.242		
	8th Grade	110	4.39	.50		95.564	397			
	Levene	1.113	p=.344		Total					
EDPAB	5th Grade	101	4.43	.55	Between groups	1.505	3	.502	1.838	.140
	6th Grade	77	4.52	.50						
	7th Grade	110	4.34	.56	Within groups	107.553	394	.273		
	8th Grade	110	4.44	.48		109.059	397			
	Levene	.942	p= .420		Total					
EARWT	5th Grade	101	3.68	.91	Between groups	1.614	3	.538	.753	.510
	6th Grade	77	3.61	.86						
	7th Grade	110	3.79	.76	Within groups	274.187	394	.273		
	8th Grade	110	3.72	.81		275.800	397			
	Levene	1.306	p=.272		Total					
Overall Scale	5th Grade	101	4.16	.44	Between groups	.025	3	.008	.046	.987
	6th Grade	77	4.17	.40						
	7th Grade	110	4.17	.42	Within groups	70.780	394	.180		
	8th Grade	110	4.18	.43		70.805	397			
	Levene	1.148	p=.329		Total					

*p<.05

When Table 7 is examined, no statistically significant difference between parents' opinions based on the variable of educational status in MEPES and its factors can be seen [$F_{3\text{-}394}$= .029 for ETCUAS, $F_{3\text{-}394}$= 1.838 for EDPAB, $F_{3\text{-}394}$= .753 for EARWT, $F_{3\text{-}394}$= .046 for the whole scale; p<.05]. Considering arithmetic means, the opinions of parents of 5th grade ($\overline{X}$ =4.38), 6th grade ($\overline{X}$ =4.38), 7th grade ($\overline{X}$ =4.38) and 8th grade ($\overline{X}$ =4.39) students in the ETCUAS factor; the opinions of parents of 5th grade ($\overline{X}$ =4.43), 6th grade ($\overline{X}$ =4.52), 7th grade ($\overline{X}$ =4.34), and 8th grade ($\overline{X}$ =4.44) students in the EDPAB factor were at "very high" level whereas the opinions of parents of 5th grade ($\overline{X}$ =3.68), 6th grade ($\overline{X}$ =3.61), 7th grade ($\overline{X}$ =3.79), and 8th grade ($\overline{X}$ =3.72) students in the EARWT factor and the opinions of parents of 5th grade ($\overline{X}$ =4.16), 6th grade ($\overline{X}$ =4.17), 7th grade ($\overline{X}$ =4.17), and 8th grade ($\overline{X}$ =4.18) students in the whole scale are at "high" level, which does not create a significant difference between groups.

Findings on the Qualitative Dimension

This section contains findings derived from the opinions of parents of middle school students about the expectations of mathematics education, the difficulties they encounter in the process, and suggestions for these difficulties.

Parents' Opinions on the Expectations for Mathematics Education and the Reasons for these Expectations

Within the scope of the study, the parents' expectations for mathematics education and their perspectives on the reasons for these expectations were solicited, and the findings obtained from the parents' responses are shown in Figure 1.

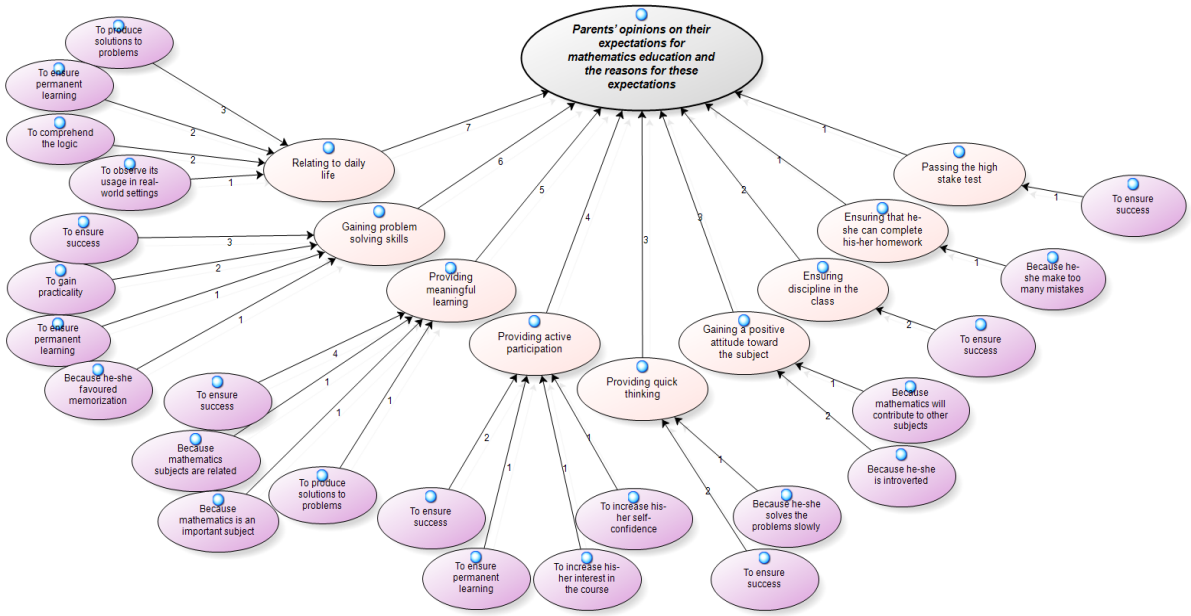

Figure 1. Parents' opinions on their expectations for mathematics education and the reasons for these expectations

As shown in Figure 1, the most frequently expressed views of parents regarding their expectations for mathematics education formed 9 themes as "Relating to daily life" (f: 7), "Gaining problem solving skills" (f: 6), "Providing meaningful learning" (f: 5), "Providing active participation" (f: 4), "Providing quick thinking" (f: 3), "Gaining a positive attitude toward the subject" (f: 3), "Ensuring discipline in the class" (f: 2), "Ensuring that he/she can complete his/her homework" (f: 1), and "Passing the high stake test" (f: 1). According to the detailed examination, the reasons constituting the theme of "Relating to daily life" are "To produce solutions to problems" (f: 3), "To ensure permanent learning" (f: 2), "To comprehend the logic" (f: 2), "To observe its usage in real-world settings" (f: 1); the reasons constituting the theme of "Gaining problem solving skills" were "To ensure success" (f: 3), "To gain practicality" (f: 2), "To ensure permanent learning" (f: 1), "Because he/she favoured memorization" (f: 1); the reasons constituting the theme of "Providing meaningful learning" are "To ensure success" (f: 4), "Because mathematics subjects are related" (f: 1), "Because mathematics is an important subject" (f: 1), "To produce solutions to problems" (f: 1); the reasons constituting the theme of "Providing active participation" are "To ensure success" (f: 2), "To ensure permanent learning" (f: 1), "To increase his/her interest in the course" (f: 1), "To increase his/her self-confidence" (f: 1); the reasons constituting the theme of "Providing quick thinking" (f: 3) are "To ensure success" (f: 2), and "Because he/she solves the problems slowly" (f: 1); the reasons constituting the theme of "Gaining a positive attitude toward the subject" are "Because he/she is introverted" (f: 2) and "Because mathematics will contribute to other subjects" (f: 1); the reason constituting the theme of "Ensuring discipline in the class" is "To ensure success" (f: 2); the reason

constituting the theme of "Ensuring that he/she can complete his/her homework" is "Because he/she make too many mistakes" (f: 1), and the reason constituting the theme of "Passing the high stake test" (f: 1) is "To ensure success" (f: 1).

Sample statements of parental expectations for mathematics education, as well as the reasons for these expectations, are provided below.

> **P4-M-8-U** *"He/she must learn where and what the taught mathematics is used for, and reinforce it with examples from everyday life, because examples make it permanent and persuasive. Yes, mathematics is useful in everyday life, the student should respond."*
>
> **P13-M-6-U** *"In order to be successful, one must develop the ability to think quickly and solve problems."*
>
> **P19-F-7-U** *"Since the topics are related to each other, I expect problems to be solved after each topic has been thoroughly studied and the students have actively participated in the course, then new topics should be studied. Everything is interconnected in mathematics, the curriculum is very dense, the teacher teaches fast to catch up."*

Parents' Opinions on the Difficulties They Encounter Given Their Expectations of Mathematics Education

Considering the parents' expectations from mathematics education within the scope of the research, their opinions about the difficulties they encountered were solicited and the findings obtained from the parents' responses are shown in Figure 2.

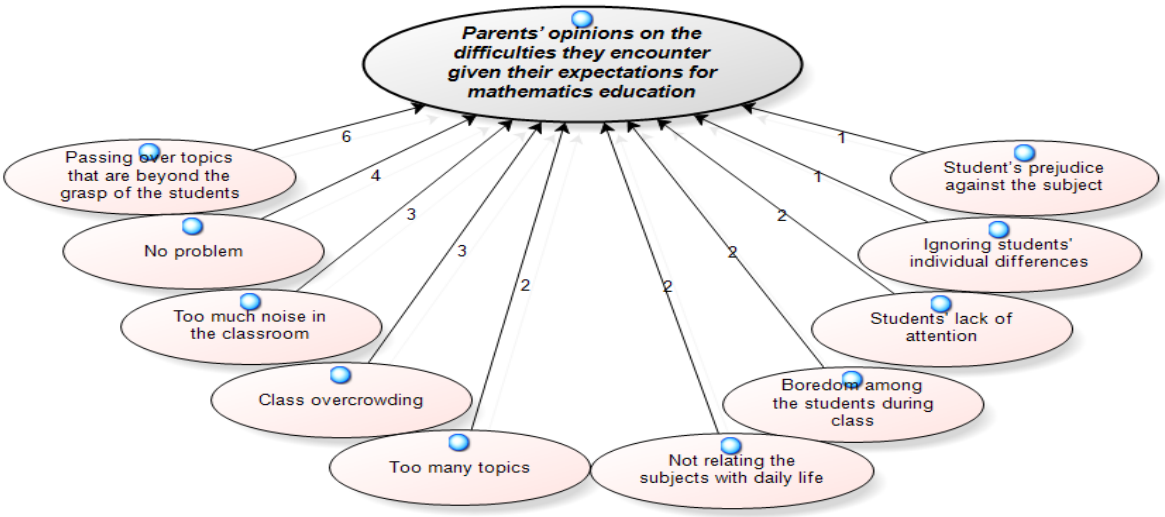

Figure 2. Parents' opinions on the difficulties they encounter given their expectations for mathematics educatio

Figure 2 shows that, when parents' expectations for mathematics education are considered, their opinions on the difficulties they encounter range from the most frequent to the least frequent formed 9 themes as "Passing over topics that are beyond the grasp of the students" (f: 6), "Too much noise in the classroom" (f: 3), "Class overcrowding" (f: 3), "Too many topics" (f: 2), "Not relating the subjects with daily life" (f: 2), "Boredom among the students during class" (f: 2), "Students' lack of attention" (f: 2), "Ignoring students' individual differences" (f: 1), and "Student's prejudice against the subject" (f: 1). Furthermore, some of the parents claimed that they did not encounter any difficulties (f: 4).

In light of parents' expectations for mathematics education, sample statements of their opinions on difficulties they encounter are provided below.

> **P5-M-8-U** *"The inability to relate the subjects to daily life, having too many topics, and passing over topics that are beyond the grasp of the students."*

P6-F-5-P *"Constant noise in the classroom because others talk without having the right to speak, interrupt the lesson, and make very empty speeches while my child is listening to the lesson."*

P22-F-8-P *"Due to class overcrowding, there is too much noise in the classrooms."*

Parents' Opinions on the Suggestions for the Difficulties They Encounter Considering their Expectations for Mathematics Education

Considering the parents' expectations from mathematics education within the scope of the research, their opinions on the suggestions for the difficulties they encounter were solicited, and the findings obtained from the parents' responses are shown in Figure 3.

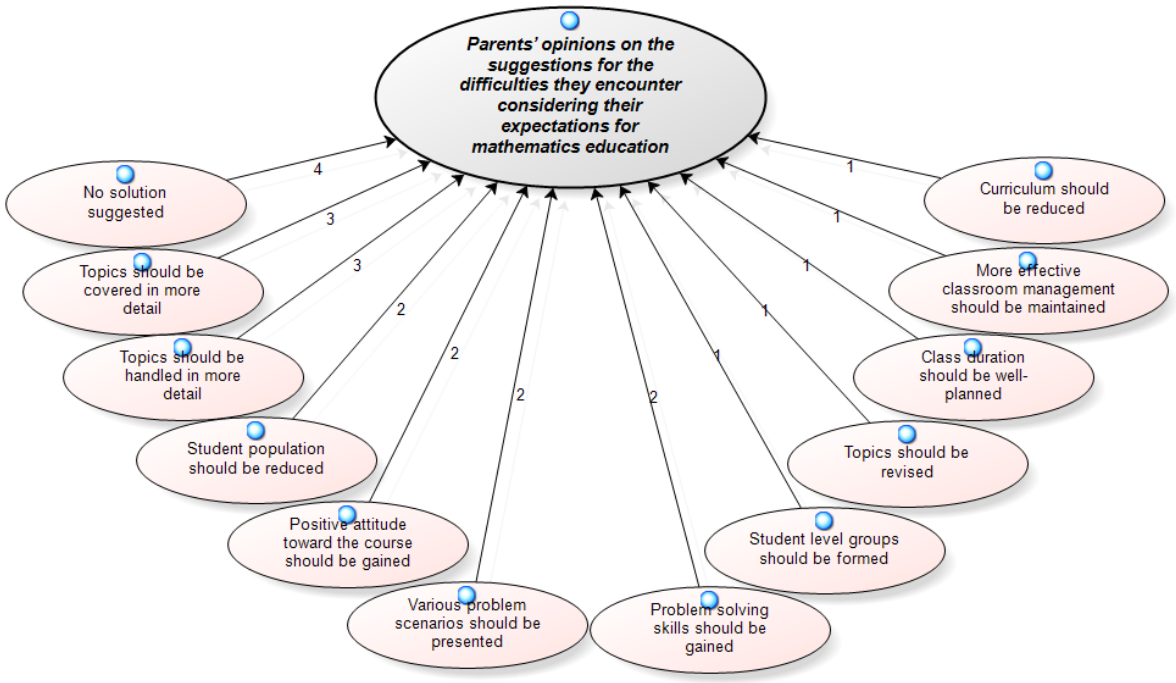

Figure 3. Parents' opinions on the suggestions for the difficulties they encounter considering their expectations for mathematics education

The opinions of the parents regarding the suggestions for the difficulties they come across formed eleven themes and are shown in Figure 3 from the highest frequency to the least frequency, respectively: "Student active participation should be ensured" (f: 3), "Topics should be covered in more detail" (f: 3), "Student population should be reduced" (f: 2), "Positive attitude toward the course should be gained" (f: 2), "Various problem scenarios should be presented" (f: 2), "Problem solving skills should be gained" (f: 2), "Student level groups should be formed" (f: 1), "Topics should be revised" (f: 1), "Class duration should be well-planned" (f: 1), "More effective classroom management should be maintained" (f: 1), and "Curriculum should be reduced" (f: 1). In addition, some of the parents did not offer suggestions because they did not encounter any difficulties (f: 4).

Considering the expectations of the parents from mathematics education, sample statements of the suggestions offered for the difficulties they encounter are given below.

P15-F-6-P *"The teacher should make a list of the students, call each student to the board, activate the students, and explain the topics in greater detail."*

P9-M-5-H *"In order to teach mathematics more effectively, rather than teaching topics covered only through simple examples, more detailed topics should be covered, and then problems should be solved."*

P13-M-6-U *"The class should be no more than 15 to 16 students."*

P10-F-5-U *"Various problems should be solved and children should be asked to do activities."*

Discussion and Conclusion

The purpose of this study is to identify the level of expectations held by parents of secondary school students, whether these expectations differ significantly across a range of variables, and to identify the expectations of parents regarding mathematics education, difficulties they run into, and solutions they suggest.

In the quantitative aspect of the research conducted with the mixed method, the expectation levels of the parents of middle school students about mathematics education were examined and the parents' expectations were found to be "very high" in the ETCUAS and EDPAB factors, and "high" in the EARWT factor and overall scale. Similarly, in a study conducted by Bozkurt and Dülger (2021), the expectations of parents from mathematics teachers were investigated, and it was found that the parents' main expectations for the teacher were that the students would enjoy mathematics and that the teacher would maintain classroom discipline in addition to expecting active participation from the students. Parents in the study of Civil et al. (2003) also stressed a comfortable and confident teacher-student interaction in which students were not intimidated

When the opinions of the parents on the MEPES and its factors are examined in relation to the gender variable, it is found that there is a statistically significant difference in favour of female parents in the scale's EARWT factor. However, it was found that there was no statistically significant difference in the opinions of the parents in relation to the gender variable for the whole scale, with the ETCUAS and EDPAB factors. Although there is no statistically significant difference, when the arithmetic means are looked at, it is found that the means of male parents are higher than the means of female parents in the EDPAB factor and that the means of female parents are higher in the ETCUAS factor. This finding can be explained by the fact that female parents pay more attention to their children's mathematics and other subjects than male parents (Aksu & Topal, 2012). On the other hand, the study by Deringöl (2019), in contrast to the current research result, came to the conclusion that fathers' expectations from mathematics education were higher than mothers' expectations from mathematics education, though the difference was not statistically significant.

When the opinions of the parents on the MEPES and its factors are examined according to the educational status variable, it is found that there is a statistically significant difference between the opinions of the parents on the entire scale and its factors. Between primary school and high school graduate parents, there is a difference in the study's overall scale that favoured primary school graduate parents; it is determined that these parents have "very high" expectations compared to the other groups, who have "high" expectations. When the arithmetic means are examined, it is revealed that the opinions of primary, middle, high school, and university graduate parents in the ETCUAS factor are "very high", with the difference between the groups favouring university graduate parents among primary school and university graduate parents. The opinions of primary, middle, high school, and university graduate parents are all "very high" in the EDPAB factor, with the difference between groups favouring university graduate parents over middle and high school university graduate parents. In the EARWT factor, expectation levels of primary, middle, and high school graduates were "high", while expectation levels of university graduates were "moderate". There is a difference between the groups that favours parents with primary and middle school graduates when compared to parents with high school diplomas, as well as primary and middle school graduates when compared to parents with university degrees. Upon reviewing the literature, Thomson et al. (2003) found that students whose parents had a low educational level were less successful in mathematics; Augustine (2014) found that parents with

undergraduate education have higher expectations from their students than parents with other education levels.

According to the student's gender, the study's analysis of parents' opinions on the MEPES and its factors came to the conclusion that there was no statistically significant difference between the parents' views on the scale as a whole and its sub factors. In Visser's (1989) research, it was discovered after a review of the literature that parents still viewed mathematics as a male activity and that they had higher expectations for male students than for female students when it came to their performance in math lessons. However, the current study parallels the study of Dar-Nimrod and Heine (2006) in that there is no significant difference between the views of the parents based on the gender variable of the student, and the conclusion does not strengthen the concept of gender difference in the field of mathematics.

When the parents' opinions on the MEPES and its factors were examined according to the variable of the student's grade level, it was concluded that there was no statistically significant difference between the parents' opinions on the whole scale and its sub-factors. Similarly, Deringöl (2019) discovered that there was no significant difference between the grade level of the children and the parents' expectations from the mathematics course. This is an unexpected outcome, especially given that 8th grade parents should have higher expectations given the upcoming high stakes test.

In the qualitative aspect of the study, parents of middle school students were asked about their expectations for mathematics education, difficulties encountered during the process, and suggestions to these problems. In line with the first sub-problem of the qualitative dimension, the parents' expectations for mathematics education and their perspectives on the reasons for these expectations were revealed.

Parents' expectations for mathematics education were divided into nine themes as "Relating to daily life", "Gaining problem solving skills", "Providing meaningful learning", "Providing active participation", "Providing quick thinking", "Gaining a positive attitude toward the subject", "Ensuring discipline in the class", "Ensuring that he/she can complete his/her homework", and "Passing the high stake test". It is clear that parents expect their children to learn mathematics in a way that is compatible with modern mathematical understanding rather than just preparing them for exams. This finding was supported by Civil et al. (2003) whose results showed that parents wanted their children to learn "why" behind things in mathematics. In the study by Bozkurt and Dülger (2021), in which the expectations of the parents from the mathematics teacher were examined, it is seen that the expectations of parents such as increasing students' success in daily life by fostering their mental skills such as reasoning, problem-solving, and practical thinking, making students love mathematics, solving lots of problems, making the students active and providing discipline in the classroom overlap with the findings of the current research. Parents stated in a study conducted by Şen and Gülcan (2012), which supports the theme of "Ensuring that he/she can complete his/her homework" that teachers should provide enough time and support for students to do their homework on their own by assigning daily homework. In the research conducted by Deringöl (2019), parents emphasized the expectation from the mathematics teacher that students gain practicality to solve the problem situations given to them in the mathematics course, which is in line with the theme of "Gaining problem solving skills". Aksu and Topal (2012) came to the conclusion that rewarding students with higher math achievement for their studies will help them develop a positive attitude toward mathematics, which supports the theme of "Gaining a positive attitude toward the subject". When the parents' reasons of their expectations for the mathematics course are examined, it becomes clear that nearly every theme emphasizes the importance of fostering permanent learning and student success.

When parents' expectations for mathematics education are considered, their opinions on the difficulties they encounter formed 9 themes as "Passing over topics that are beyond the grasp of the students", "Too much noise in the classroom", "Class overcrowding", "Too many topics", "Not relating the subjects with daily life",

"Boredom among the students during class", "Students' lack of attention", "Ignoring students' individual differences", and "Student's prejudice against the subject". In addition to these findings, Ayhan (2006) investigated the challenges associated with teaching mathematics. These issues included students' fear of failing math lessons, overcrowded classrooms, being disliked by the students, insufficient lesson hours, and teacher-centred approach.

The opinions of the parents regarding the suggestions for the difficulties they come across formed eleven themes as "Student active participation should be ensured", "Topics should be covered in more detail", "Student population should be reduced", "Positive attitude toward the course should be gained", "Various problem scenarios should be presented", "Problem solving skills should be gained", "Student level groups should be formed", "Topics should be revised", "Class duration should be well-planned", "More effective classroom management should be maintained", and "Curriculum should be reduced". When the literature is examined, middle school students made similar suggestions regarding mathematics education problems in a study conducted by Dağdelen and Ünal (2017), which supports the current research findings, as methods should be developed to make students enjoy mathematics courses, outcomes and activities should be reorganized in light of the time constraints encountered in practice; according to Işık et al. (2008), a connection with daily life should be established, individual differences among students should be considered, adequate time should be allotted for problem solving, and presentations should be made in a way that the student can understand. Jay et al. (2018) also stresses the importance of developing positive attitudes toward mathematics for students to gain awareness of the importance of learning mathematics.

When the research findings are viewed as a whole, it can be stated that the expectations of the parents from the mathematics course support the student-centred mathematics teaching that the new century and information society demand. It is observed that parents, rather than a teacher-centred, exam-oriented teaching, adopt an understanding in which students are active in order to develop students' mathematical literacy skills, make them love mathematics, and understand the relationships between concepts in mathematics. The parents' expectation is that teaching environments will be created in which students will learn information in mathematics that they can use in daily life in a meaningful and permanent way and use it to solve problems. These findings are consistent with the mathematical skills outlined in both the mathematics curriculum and vision documents.

In order to meet these parental expectations and achieve the desired educational outcomes, the following recommendations are presented in accordance with the research findings:

Parent participation and workshop programs for parents should be organized so that they can learn about their children's mathematics education and strategies. These programs will allow parents to share their thoughts and expectations about mathematics education with students, teachers, and other parents.

In the current study, the expectations of the parents of middle school students in the central district of Sivas were investigated using a mixed research methodology. It will advance the field to carry out comparable studies with various study groups using quantitative, qualitative, and mixed research methods and compare the findings. Additionally, it is thought to be a crucial step to consider parents' perspectives on the primary school years, when students' mathematical foundations are built, and to conduct studies to improve math achievement by taking these perspectives into account.

Ethics Committee Approval:

Sivas Cumhuriyet University Scientific Research and Publication Ethics Social and Human Sciences Board, Date: 02.04.2021, Number: E-60263016-050.06.04-29054

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Pandemic Period in Turkey Through the Eyes of Pre-School Education Stakeholders: How Did Children Return to School?

Research Article

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ABSTRACT

The Covid-2019 pandemic has had an impact on education processes, as it does in every other field in the world, and face-to-face education has been suspended in a significant part of this process in Turkey, and distance education has been started. Preschool children who attend face-to-face or distance education from time to time returned to their classrooms with the decision of Turkey to transition to uninterrupted face-to-face education in September 2021, but with the return to face-to-face education, some problems began to be experienced at homes and schools. For this reason, the research aims to determine the opinions and suggestions of all relevant stakeholders, the effects of the experiences with the Covid-19 pandemic in preschool education in our country on children, and on the adaptation processes of children in returning to face-to-face education. The research was designed in a case study pattern and was conducted with an online focus group meeting attended by representatives from all relevant stakeholders. Working group; it consists of 16 people working in different settlements and institutions in seven different geographical regions in Turkey. The data analysis process was carried out with four main themes and thirteen sub-themes as the reflection of the process on the developmental characteristics of children, the school adaptation process, the child-school-family relations, and the solution proposals of the stakeholders. The results of the research revealed that negative effects were observed especially in the social-emotional and motor development areas of children and that the orientation processes in schools were prolonged. Considering these effects, it is necessary to re-discuss how to support children in classrooms and how pre-school education processes can be structured more effectively.

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Covid-19, distance learning, early childhood education, pandemic

Introduction

The world was faced with a virus that emerged towards the end of 2019 and was named 'coronavirus' by the World Health Organization (WHO, 2021) on January 5, 2020. The virus, called COVID-19, became impactful all over the world in a short span of time and a global pandemic was declared by the World Health Organization on March 11, 2020 (TR Ministry of Health, 2021; WHO, 2021). The word "pandemic" is defined by the Ministry of Health of the Republic of Turkey as "the spread of a disease or an infectious agent in a very wide area such as countries, continents, and even the whole world." (TR Ministry of Health, 2020). Many countries decided to shut down some institutions, including schools and universities in order to reduce the high contagiousness of the pandemic and slow its spread, (Bozkurt & Sharma, 2020; Bozkurt, 2020).

With the schools being closed, it was observed that generally the countries tried to continue education by developing digital tools. It was found that schools mostly used online channels to reach children; they preferred face-to-face education after that, and they turned to television as the last option during the pandemic period (Organisation for Economic Co-operation and Development [OECD], 2021). When we examine the pre-school education across OECD countries, the period in which pre-school education institutions were closed constitutes approximately 28% of an academic year, and it is known that pre-school education level was the one that was closed for the least time among other education levels. On the other hand, it was seen that Austria, Estonia, Finland, Latvia and Sweden, for instance, never shut down pre-school education institutions and continued education in every condition. It was stated reasons for pre-school institutions to be the institutions in the world that are shut down for the least time are that the first years of childhood are critical in terms of cognitive and emotional development, distance learning strategies are challenging for young children, and the working life of families is interrupted when these institutions are closed (OECD, 2021; United Nations Educational, Scientific and Cultural Organization [UNESCO], 2021a).

Examining the international studies researching the effects of the COVID-19 pandemic period on children, it was stated that the eating, screen time, and sleep routines of young children were affected, and there was a great decrease in the physical activity of children whose routines had been disrupted (Clarke et al., 2021; Cordovil et al., 2021; Fernandez Ruiz, 2021; López Bueno et al., 2021; OMEP Executive Committee, World Organisation for Early Childhood Education [OMEP], 2020). In this period, it was observed that social contact with the environment decreased, children experienced great limitations in being with their friends and playing games, and their vulnerability, worry and anxiety levels increased (Pascal & Bertram, 2021; Vasileva, Alisic & De Young, 2021). The parents stated that they observed social-emotional deficiencies in their children mostly (Barnett & Jung, 2021; López-Bueno et al., 2021) and that their children's social skills decreased (Li & Lalani, 2020; Linnavalli & Kalland, 2021). In its report published by United Nations International Children's Emergency Fund (UNICEF, 2021), it was stated that they were experiencing the biggest crisis in their 75-year history that reversed the hard-earned achievements for children. The interruptions that occurred in education during the pandemic period increased the inequalities of opportunity in education strikingly (UNESCO, 2021b), especially socio-economically disadvantaged students were more affected by this situation (Andrew et al., 2020).

This process can be summarized as follows by looking at The Ministry of National Education [MoNE], 2020a; 2020b; 2020c reports;

The COVID-19 pandemic period, which affected the entire world, caused preschool education institutions to remain shut down for a while in Turkey, and education was interrupted. Firstly, the preschool education institutions were closed on March 16, 2020, and as of March 23, 2020, a transition to distance digital education was made. The Ministry of National Education started broadcasting preschool education activities on the TRT EBA Primary School television channel on 12 October 2020 as 3 separate programs every weekday. On October 16, 2020, the TRT EBA Kindergarten television channel was opened to provide preschool children with the education they need for their visual, sensory, and mental development processes, with the slogan "The world's largest kindergarten without walls". Private preschool education institutions, which had been shut down for a total of 77 days, started face-to-face education in the summer again, as of June 1, 2020. On the other hand, independent public preschool education institutions started with face-to-face classes for two days and distance education for three days as of September 16, 2020. However, kindergartens within primary schools were not included in this process and remained closed. Private and independent preschools transitioned to face-to-face education as of October 12, 2020, and kindergarten classes started face-to-face education on March 2, 2021. Uninterrupted face-to-face training has been continuing since. (Gencer, Kesbiç & Arık, 2021).

According to the studies conducted, concepts such as online education, digital education, screen, television and internet use have come to the fore in the distance education process in preschool children (MoNE, 2020d). A number of changes such as screen addiction, shortening of attention span, and increasing digital game addiction tendencies occurred in children who spent a lot of time with all these with the distance education model, and these changes have been determined as the negative effects of the process (Aktan Acar, Erbaş & Eryaman, 2021; Güzen, 2021; Konca & Çakır, 2021). In addition, it has been found that distance education is insufficient in supporting social development (Aktan Acar et al., 2021; Zeybekoğlu Akbaş & Dursun, 2020) it is inefficient compared to face-to-face education, however, distance education is important in order not to break the bond of children with school during the pandemic period (Kuset, Özgem, Şalmazcıoğlu & Güldal Kan, 2021). At the same time, positive opinions emerged, such as that families participated in their children's education in this process more actively and when distance education could be utilized effectively and efficiently, it supported effective teaching such as providing plenty of stimuli to the child (Yürek, 2021).

Studies also emphasize the importance of parental support in the education of the child in order to be successful in the digital education environment (Liu, Black, Algina, Cavanaugh, & Dawson, 2010; Makrooni, 2019; Woofter, 2019). Research shows that quality distance education is not possible if it is not supported by parents (Railienė, Merfeldaite & Prakapas, 2021). The quality of distance education largely depends on the level of digital access and the quality of digitalization that all participants in education (teachers, students, parents) have (Li & Lalani, 2020). For this reason, it is stated that the main problems experienced in the distance education process are largely due to the inadequacy of teachers in technology applications and the poor management of the process (Lindahl & Folkesson, 2012).

Studies conducted with teachers on the effects of the pandemic period on preschool education processes reveal that children have problems accessing the internet, and inequality of opportunity can be seen deeply and causes difficulties in the process (Aktan Acar, et al., 2021). During the pandemic period, three different webinars were held by Kuru, Haktanır, and Ağlamaz (2020) named "Distance Education Studies and Experience Sharing in Preschool Education Institutions in the Covid-19 Pandemic", "Proposed Solution for the Problems Experienced in the Distance Education Process Carried out in Preschool Educational Institutions in the COVID-19 Pandemic" and "What Have We Learned From the Distance Education Process Carried Out in Preschool Educational Institutions During the Covid-19 Pandemic Period?", and the results were compiled in the report titled "Distance Education Studies Conducted in Preschool Educational Institutions During the Pandemic Period, Webinar Studies Problems, and Proposed Solutions". As a result of the webinars made,

various problems experienced by families and teachers were observed, and then solutions were developed for the problems encountered. One of the most agreed-upon opinions in the study was that all developmental areas of children could not be supported in the distance education process due to inequalities of opportunity (Kuru, et al, 2020). In similar studies, it was found that there are deficiencies in terms of social learning and communication skills in children since they could not be together with their peers and their muscle development could not be supported adequately (Aykar & Yurdakal, 2021; Bağçeli Kahraman & Apak, 2021; Yürek, 2021). In some studies, however, the teachers stated that children missed their school and friends deeply and since their needs, such as playing games and socializing are not met efficiently, they have been affected negatively from this process. (Duran, 2021; Ogelman, Güngör & Göktaş, 2021).

In studies made with parents on the effect of the pandemic period on the pre-school education processes; It has been stated that children experienced situations such as anger, unhappiness, introversion, fear, and anxiety in the field of social-emotional development (Göl-Güven, Şeker, Erbil & Özgünlü, 2021), as well as negative behavioral changes such as aggression, stubbornness, crying and shouting, difficulty in speaking and refusal to communicate (Konca & Çakır, 2021; Ok, Torun & Yazıcı, 2021). In addition to this, parents also stated about their children that they had difficulty setting boundaries for them, leaving the schools made children sad (Dikme & Gültekin, 2021), kindergarten period children got quite unhappy since they could not go to kindergarten, however, they got used to this situation over time (Çelik & Çak, 2021).

In studies carried out in order to get the opinions of school administrators on distance education and the pandemic period, the administrators stated that pre-school children had some problems in their technology use skills due to their age and that they might be insufficient in using technology correctly (Yakut & İçbay, 2021; Kara & Bozkurt, 2021; Özdoğru, 2021). They stated that, in parallel with the opinions of teachers and parents, they encountered problems such as the lack of social development of children and the formation of learning deficiencies (Kara & Bozkurt, 2021; Özdoğru, 2021).

Academics evaluating the distance education process stated that children had difficulties since their technological knowledge was limited and were negatively affected in terms of social and emotional development (Seven & Yürek, 2021), significant limitations were found at the point of interaction, and distance education increased technology addiction in children (Yürek, 2021).

The pandemic period had various effects on children both in the world and in our country, and the impressions of the relevant stakeholders emerged in different studies; however, there are not many studies on how and how these effects of the pandemic on children are reflected in the classroom environment during the process of their return to face-to-face education. Herein, the fact that the need for all stakeholders (academics, parents, school administrators/teachers in private and public institutions) to come together and share their experiences about the traces left by the pandemic period on children and the reflection of these traces on the classroom environment in the return to face-to-face education arises. There while, it is thought that such a study can be a guide on how to support children in classrooms and how to structure preschool education processes more effectively, with also taking into account the traces of the pandemic period.

Purpose of the Research

The purpose of this research is to determine the opinions and suggestions of teachers, administrators, parents, and academicians working in this field regarding the effects of the experiences in pre-school education in our country during the COVID-19 pandemic on children and the adaptation processes of children when returning face-to-face education. Within this context the research question can be stated as:

- What are the effects of distance or face-to-face pre-school education experiences on children and their adaptation processes in their return to face-to-face education during the pandemic period?

Methodology

Research Model

This research was designed in the case study pattern, which is one of the qualitative research models. The aim of qualitative research is to obtain more in-depth results with less data (Seggie & Bayyurt, 2015). The case study, which is frequently preferred in qualitative research, is used in order to explain a process in details (Aytaçlı, 2012; Yıldırım & Şimşek, 2016). In the case studies, the researched case is handled with not just one, but in all aspects, and the subject is examined in depth from many aspects (Güler, Halıcıoğlu, & Taşğın, 2015). In this study, the effects of distance or face-to-face education experiences in the pre-school period during the COVID-19 pandemic period on the adaptation processes of children when they return to face-to-face education is considered as a case. For this purpose, an online focus group discussion was held with the participation of representatives from all stakeholder groups related to the issue. A focus group discussion is a form of discussion in which people can comfortably express their feelings and opinions. The maximum variation sampling method, one of the purposive sampling methods, was used in the study. It is aimed to reach the essence of the phenomenon, based on the experiences of the people participating in the study (Ersoy & Saban, 2019).

The Study Group

The study was conducted with academicians, pre-school teachers, pre-school education institution administrators, pre-school teachers, and parents who have children who continue their education, working in different regions of Turkey in October 2021, with the beginning of a new period in face-to-face education in schools following the distance education implemented due to the COVID-19 pandemic. The study group was established with the maximum diversity sampling method, which is one of the purposive sampling methods, to be able to ensure the diversity of the people who will be a party to the problem in a small study group in line with the purpose of the research (Yıldırım & Şimşek, 2016). The aim of the maximum diversity sampling method is to assess the researched phenomenon in terms of the experiences of different stakeholders by choosing the sample as different from each other as possible (Suni, 2011) and to detect the different angles of the problem by observing the relationship between the factors that vary (different regions, roles in the child's life and gender) without making any generalizations (Yıldırım & Şimşek, 2016).

The study group consists of 16 people in total; three academicians, three school principals, one deputy principal, four teachers and four parents living in different settlements (villages and cities) in seven different geographical regions in Turkey and working in different institutions (public and private) in order to ensure maximum diversity.

The information on the demographic characteristics of all stakeholders that participated in the research is presented in Table 1:

Table 1. Demographic Characteristics of the Stakeholders in the Study Group

Participants	Gender	The Region They Live in / Settlement	Occupancy	The institution the person works at
P1	M	Central Anatolia/City	Academician	Public University
P2	F	Marmara Region/City	School Manager	Public Kindergarten
P3	F	Eastern Anatolia/City	Parent	Private Kindergarten
P4	M	Black Sea Region/City	School Manager	Public Kindergarten
P5	F	Central Anatolia/City	Teacher	Private Kindergarten
P6	F	Aegean Region/City	Parent	Private Kindergarten
P7	F	Marmara Region/City	Academician	Public University
P8	F	Mediterranean Region/ City	Parent	Public Kindergarten
P9	M	Southeast Anatolia/ Village	Teacher	Public Kindergarten
P10	F	Marmara Region/City	Academician	Public University

P11	F	Marmara Region/City	School Manager	Private Kindergarten
P12	F	Marmara Region/City	Teacher	Private Kindergarten
P13	F	Black Sea Region/Village	Teacher	Public Kindergarten
P14	F	Aegean Region/City	School Manager	Private Kindergarten
P15	M	Mediterranean Region/ City	Parent	Public Kindergarten
P16	F	Aegean Region/City	Academician	Public University

Data Collection and Analysis

In the study, an online webinar meeting was held in order to find answers for the question that is "How the experiences in pre-school education during the pandemic period were reflected on children and their return to school, how did the children return to school?" A focus group meeting was held with the participation of all stakeholders over the webinar meeting and the research data were obtained on an online platform. Focus group discussion is a method that collects data based on a predetermined framework. The reason to prefer this method and its biggest advantage is that new and different results can emerge because it takes place in a group (Çokluk, Yılmaz & Oğuz, 2011). In this study, focus group discussion was preferred as one of the qualitative data collection methods, since it was aimed to analyze the existing situation and bring new suggestions to the existing order. The focus group discussion was held with an online meeting that took approximately 3 hours in the Zoom program. The purpose of the study was explained to the participants prior to the webinar and they were asked to share their views and experiences within the time (5 minutes) allotted to them in the webinar. Since recording the discussion was important for the focus group discussions (Şimşek & Yıldırım, 2020) the entire discussion was recorded and then transcribed by the researchers. During the discussion, written notes were also kept by a rapporteur. The data obtained from the discussion were analyzed using content analysis and descriptive analysis methods. In content analysis, similar data are presented within the framework of certain concepts and themes (Yıldırım & Şimşek, 2016). While carrying out content analysis, codes were assigned to the data with the inductive analysis method, and sub-categories and categories were created with codes that resemble each other. The descriptive analysis is the continuation of the theme analysis and a more detailed version of the data analysis. In the descriptive analysis, it is essential to understand and present the data related to the problem under the parent theme, category, and sub-theme, with direct quotations from discussion transcripts, document texts, and observation notes. In a way, it is essential to present people's words, without any interpretation, with the theme they were spoken, and by direct quotations and to analyze, in other words, to describe the views of the participants on the relevant theme with the collected documents and observation notes, and to make an analysis with direct quotations related to that theme in a way that will increase the internal validity of the study at the same time. The computer software program “MAXQDA” was used for the regular progress of the study. The MAXQDA program is a computer program that provides regular and systematic coding of the obtained data. It provides the researcher with the opportunity to see, evaluate and interpret the themes in a hierarchical manner (Creswell, 2019). In the study, the participants were kept anonymous and codes names were used. Data compatible with the conceptual framework were identified and interpreted as findings. In the stages of identifying and presenting the data as findings, attention was paid to using an easily comprehensible language, and direct quotations were made within the scope of descriptive analysis where necessary.

Validity- Reliability-Ethical Process

The reliability of the study was ensured with the method of comparing the coding made by the researchers using the Reliability = Consensus / Consensus + Disagreement formula (Miles, Matthew & Huberman, 1994). According to this, the average inter-coder reliability ratio is 0.91. Since humans and their changing perceptions were in question, various rules and principles were involved in the studies (Yıldırım & Şimşek, 2016). Due to that reason, the purpose of the study and what is expected of them during the discussion process were orally explained to each volunteer stakeholder by individual interviews prior to the discussion

in detail. Afterward, they were given a clarification text that includes this explanation. Finally, wet signed "Consent Forms" were obtained from the participants who stated that they participated in the process willingly and voluntarily. Thuswise, it was ensured that the participants in the study knew in detail the purpose of the research, its process, how much time they would allocate, how it would benefit whom, their responsibilities and rights. In the consent form, the purpose of the study, its duration, the fact that the information obtained will be used within the scope of the study and a workshop will be held over the Zoom program and the discussions will be recorded were explained in detail. All the rules specified within the scope of the "Higher Education Institutions Scientific Research and Publication Ethics Directive" were complied with within this study. This research has the ethics committee's permission granted by Uludağ University Social and Human Sciences Research and Publication Ethics Committee with the decision of session number 22.01 on the date of 28.01.2022.

Findings

The findings obtained after analyzing the data were presented in tables. The findings were organized according to the themes and the opinions of the stakeholders were evaluated and interpreted in subgroups. As a result of data analysis, the opinions of the participants were clustered under four main themes and thirteen sub-themes as the reflection of the process on the developmental characteristics of children, the school adaptation process, the child-school-family relations, and the solution proposals of the stakeholders. In the explanation and interpretation of the themes, direct quotations were included and the opinions of the stakeholders were tried to be identified. The four main themes and sub-themes, their findings, and their interpretations clustered are summarized in Figure 1.

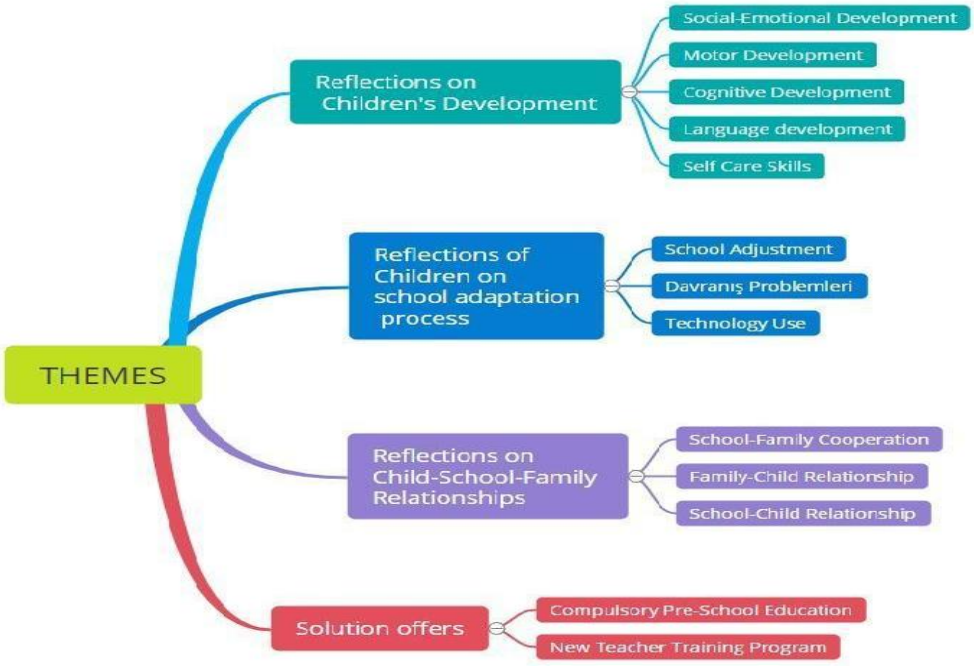

Figure 1. The Opinions of the Stakeholder Related to the Process

In the finding derived from analysis, it was revealed that the participants evaluated the reflections of the pandemic on the developmental areas of children according to different developmental areas (Table 2). The participants mentioned positive and negative experiences they faced during the child's adaptation process to school, the behavioral problems that occurred in school, and the technology use that increased with the pandemic period. (Table 3). The reflections of child-school and family relations on children's starting school were also mentioned (Table 4.) The participants also stated possible solutions for the situations they experienced (Table 5).

The opinions of the participants on their reflection on the development of children were observed in detail by creating sub-themes and codes according to four development and one skill area. The number of repetitions (the frequency) of the opinions of the participants is presented in Table 2.

Table 2. Sub-themes and codes of the theme "Reflections on the Development of the Child"

Sub-themes	Codes	Frequency
Social-Emotional Development	● Communication problems	9
	● Asociality	3
	● Late development	3
	● Lack of self-regulation	3
	● Not sharing	2
	● Not being able to play together and maintaining the game	2
Motor development	● Weakness in gross motor skills	6
	● Weakness in fine motor skills	3
Cognitive Development	● Not receiving instructions	3
	● Development below his/her age level	1
Language Development	● Inability to express oneself	3
Self-Care Skills	● Not being able to use tools/gadgets for daily life skills	4

Findings Related to the Main Theme of the "Reflections on the Development of the Child"

The theme consists of the observations and opinions of all the stakeholders (parents-teachers-principals), who were a part of the discussion, on children who continued to distance education during the pandemic period and started face-to-face education afterward. Within the scope of the study, it was observed that all stakeholders emphasized social-emotional development. In addition to this, it was observed that there were changes respectively in motor, cognitive, language development areas and self-care skills, and the problems experienced in this process.

It was stated that communication problems were the ones that occurred most commonly under the "Social-Emotional Development" sub-theme. Along with this, it was mentioned that sharing, playing games and self-regulation skills of children decreased, children became asocial and developmental delays were observed. "On the "Social-Emotional Development" sub-theme, P12 emphasized the problems children had about their ability to express themselves by saying:" The children are having difficulty in delaying their wants on social-emotional area. They are having difficulty with expressing their emotions The children know happy and sad but they do not know what is making them happy or sad. So, they can not name the emotion. Subsequently, they cannot express their emotion in appropriate ways, so when they get angry or upset about something, they display different attitudes, this time they begin to suffer in their peer communication and social relations begin to deteriorate."

P7, about the children playing games, expressed his/her opinions by saying: They have toy sharing problems. The opinions of P15, which explains the reason for this situation, are: "As an example to the problems we have, there is selfishness. Because both I and his/her mom keeps saying him/her not to take anything from anyone, give anything to anyone, not to make contacts, and we give a constant bombardment of warnings, so to speak."

When the opinions about the motor development area were observed it was found that compared to other development processes, the gross motor skills were talked about more. About this situation, P9 emphasized the negative effects on the gross motor skills by stating: "The children have lack of movement. They are very slow in eating food and playing games. They are not running around and jumping. There is a calmness, a stillness on the children." Similarly, P12 also mentioned that the movement activities of the children decreased, by saying: "We have students who experience difficulty in gross motor skills, climb up and go down stairs and performing moves in physical education."”

In the cognitive development category, the participants mentioned that the children had the most difficulty in receiving instructions and that their desire to finish something they started decreased. For instance, one participant, P7, explained the situation with these words:" Problems of focusing and attention, inability to finish the work that they started, inability to persevere, difficulty in following instructions, decrease in creative thinking, problem-solving skills, and especially in imagination, the level of scribbling in artistic skills of the children; For example, when they are told to draw a cat, draw a human, or even draw a picture of themselves, the drawings are poor of details, just a head and legs coming out of the head, and doodles."

When the opinions of participants regarding language development were examined, it was found they observed deficiencies in the expressive language development of children. P10 stated the situation regarding language development by saying: "... Children have deficiencies in language skills. Receptive language is full, but there are unfortunately important gaps in expressive language. Children are not able to form sentences and express themselves sufficiently. Their vocabulary is severely deteriorated, preventing them from expressing their feelings and thoughts."

When the self-care skills were observed, it was found the fact that the children had difficulty with performing the self-care skills expected from their age level was expressed. Regarding these opinions, P9 expressed his/her opinions saying:" ...the increase in the number of students who have difficulties in using personal materials regularly and without assistance, difficulties in collecting and arranging the materials after the work is done, using cutlery, wearing shoes, and coats, and toilet training." Another participant, P14, who thought that the difficulties the children had in self-care skills also affected other areas, said:" ... Children's difficulties in both developing their self-care skills and using their time were reflected in the school."

Table 3. Sub-themes and codes of the theme of "The Reflections of the Child on the Adaptation Process to School"

Sub-themes	Codes	Frequency
School Adaptation	● Orientation process	9
	● Emotions experienced when they are back to school	9
	● Difficulty accepting the school rules	1
Behavioral Problems	● Anxiety disorder	7
	● Behavior disorder	4
	● Attention deficit	1
Technology Use	● Negative effects (technological addiction, language development)	5
	● Positive effects (technological ability and learning, school belonging)	3

Findings Related to the Main Theme of the "The Reflections of the Child on the Adaptation Process to School"

In Table 3, the frequencies of the opinions of all the stakeholders who participated in the discussion on the situations they encountered during the adaptation to the school of children who continued distance education during the pandemic and then started face-to-face education are given. "The Reflections on the Child's Adaptation Process to School"; were examined according to sub-themes of school adaptation, behavioral problems and technology use. According to the findings obtained from the stakeholders, it was understood that the return of children to school was eager and crowded. Children returned to school with some behavioral problems after the pandemic. These are in the form of; attention deficit, and mentioned by most participants, the anxiety disorder. It was stated that this situation made it difficult for children to adapt to school, to adopt school rules, and to have an orientation process that took longer than before the pandemic.

When the opinions under the sub-theme of "School adaptation" were evaluated, it was observed that the children who started face-to-face education during the pandemic period had the most change in the orientation process and this process was prolonged. Regarding this situation, P14 expressed their opinions saying:"... Normally the orientation process is completed within 2 weeks, 3 weeks at longest. However, it was

prolonged during this period, unfortunately." Similarly, P15 expressed his/her views by saying "...when I wait by the classroom door, as much as I could observe, the adaptation problems were not resolved. When I ask my child how the school was she/he said it was not good, because My friends were constantly crying and stated that the children's adaptation process still continued. P11, who experienced that the orientation processes of children differed according to their developmental periods, expressed his/her observations as follows: "...While the 3-4 year olds adapted much faster, the orientation processes took shorter time, on the contrary, we had much more difficulty in the 5-year-old group. There are students who are still in the orientation process. "

When opinions regarding the emotions experienced during the back-to-school process were observed, it was stated that most of the children returned to school with much excitement and joy. While P2 expressed her/his experiences regarding the emotional states of the children as follows:"... They returned to schools in great crowds, they are extremely demanding." P8 expressed his/her experiences saying:"...Right now, she/he is going to school very happy because she/he had no friends for 2 years. "

The finding obtained as a result of the analysis revealed that the children experienced various anxiety and behavior problems during their back-to-school process. Regarding the most common anxiety problems the children faced, P10 expressed his/her child's worries saying:"...My child still does not feel safe. I have come across a lot of children who did not want to go out and play with toys Because they say there is the virus there or I do not want this friend to sit next to me because she/he has the virus." Likewise, P8 stated that the anxiety was reflected on the body saying:"... She/he has become very asocial. (Withdrawal) They are always worried about going to school. They always think 'I do not want to go to school or will anything happen to me if I want to go?' And when she/he cannot express these thoughts externally, she /he starts to pick her/his hair."

P10 expressed his/her opinions on the behavioral disorders that children showed during their return to school: " Learning problems under the heading of dyslexia have reached the ceiling. Hyperactivity is very high. There are impulse control problems, problems with delaying gratification, childhood depression, emotional balance disorders, anxiety disorders, emotional problems that are very serious. There is an increase in childhood masturbation. Most of them have attention problems. "

Participants expressed their experiences that technology, the use of which increased at home during the pandemic period, had positive and negative effects on children. While P1, who observed that technology use had positive effects on children returning to school:"... Although they were overloaded by technology. They learned a great deal thanks to this." P4 explained that technology also supported children socially saying:"... They stayed in touch with the school during the pandemic period thanks to the live lessons, therefore their sense of belonging was preserved." However, P5, who thought and observed that technology use of the children affected their back-to-school process stated: "... I have students who don't maintain eye contact and stay still. We came across behaviors such as tantrums and self-harm when they cannot access a screen." P11, on the other hand, stated that technology also had negative effects on different areas by saying: "... There are problems related to language development because they were exposed to one way communication in front of the screen".

Table 4. Sub-themes belonging to the "The Reflections of Child-School and Family Relations" theme

Sub-themes	**Frequency**
Family-Child Relationship	11
School-Parent Relationship	8
School-Child Relationship	4

Findings Related to the Main Theme of the "The Reflections of Child-School and Family Relations"

In Table 4, the opinions of all stakeholders participating in the discussion regarding the process of starting face-to-face education after distance education during the pandemic period are given in the main theme of "Reflections on Child-School-Family Relationships". Within this context, the opinions were examined under the sub-themes of "School-family relationship", "Family-child relationship" and "School-child relationship". In the school-family relationship, the opinions about the increase in the cooperation of families with the school draw attention. In the family-child relationship, the situation that all stakeholders jointly mentioned was that after the family and children spent a lot of time with each other during the pandemic period, there was a situation where they could not be separated when the school started. Some participants even stated that it was at an addiction level and that families could not be separated from their children in a healthy way.

When we look at the family-child theme under the theme of school-family-child relations, among the participants who thought that families are in cooperation, P5 expressed her/his opinions saying: "… The families cooperated a lot with and supported us a lot, so we came to a better stage." However, P10, who made negative comments regarding the cooperations of the families said: "... Preschool teachers say that the families are very resistant. The expectations of the families are extremely high. They do not want to receive any negative feedback about their children."

It was stated by many participants that there was no healthy bond between parents and children, with more time spent at home during the pandemic, and therefore there were problems with going to school and adapting to school due to mother or child. While P9 stated his/her experiences about the children who did not leave their mothers regarding this situation by saying: "... Especially 3-4 students did not want their mother to leave. They waited at the entrance, checked their mothers for 15-20 minutes, and wondered if their mothers left them there and what would happen to them."; P16 expressed their observations about mothers who cannot separate from their children by saying: "... Parents can not leave their children at school. Therefore, the already individualized children cannot be a part of a group." and P6 stated:"... I also observe that parents are having a very difficult time bringing children to school."

Table 5. Sub-themes and codes belonging to the "Proposed Solutions" theme

Sub-themes	Codes	Frequency
Proposed Solutions	• The need for a new teacher training program	5
	• The fact that the pre-school education is not compulsory	4

In Table 5, the proposed opinions of all the stakeholders who participated in the discussion on the situations they encountered during the adaptation to the school of children who continued distance education during the pandemic and then started face-to-face education are given. "Proposed solutions" were examined in two codes for the compulsory pre-school education and the development of a new teacher training program. When the views of the stakeholders were examined, it was seen that they emphasized the importance of understanding the value of pre-school education and making it compulsory with the pandemic. At the same time, the need for changes in teacher training programs in universities was also expressed.

One of the participants, P14, who stated that there were differences between the child who went to school and the child who did not go to school due to the fact that pre-school education is not compulsory and expressed his/her thoughts by saying: "There are differences between the age of the children who did not go to school, the children who came to the preparatory group/primary school preparation period and those who came to school and continue." . As a result of the process they observed, the participants included their suggestions for compulsory pre-school education. P1 stated his/her ideas, saying: "Pre-school education being compulsory is very crucial. My child has been going to pre-school institutions for 3 years and I can see the developments very clearly. I wish every child could take part in these processes for many years. Because, as

you know, the longer the child stays in the learning process, the more the child increases in the context of education."

Another proposed solution of the stakeholders regarding the situations experienced during and after the pandemic is about changing the teacher training programs at the university or making improvements on the existing programs used in schools. About this subject, P11 stated a proposed solution saying:"*...I propose teacher leader programs in different modules for pre-school teachers. We must equip our teachers and strengthen them. This is the only way. Because we are only strong with our teacher. I believe that classrooms will be much more enjoyable places if we support them with enriching activities."*

Discussion,Conclusion And Suggestions

The study was carried out with the purpose of determining the opinions and suggestions of teachers, administrators, parents, and academics working in this field regarding the effects of experiences in pre-school education in our country during the COVID-19 pandemic period, on children and on the adaptation processes of children's return to face-to-face education, four main themes were formed. These are "reflections on the development of the child", " the reflections on the child's adaptation process to school", "reflections on child-school-family relations" and "proposed solutions".

When the opinions of the participants were examined, it was found that the most frequently observed effect on the theme of "reflections on the development of the child" was in the "social-emotional" area. In the webinar report prepared by Kuru et al., (2020), it was identified that children were not adequately supported especially in the social-emotional area during the distance education process and they experienced problems due to the weakening of their social skills. In addition to this, the participants stated that especially children had communication difficulties, and talked about the negative effects on social-emotional skills, which are very important in pre-school, such as maintaining games and sharing. It is thought that this situation, which is in parallel with other studies (Barnett & Jung, 2021; Li et al., 2021; Linnavalli & Kalland, 2021; López-Bueno et al., 2021) in the literature, might be due to the fact that the children couldn't be together with their peers during the pandemic period (Yürek, 2021), or it may be related to children's anxiety about sharing and playing together due to social distance and hygiene rules (Bağçeli-Kahraman & Apak, 2021). Studies show that children who have gained social-emotional skills, especially in early childhood, are more successful in the future (Collaborative for Academic, Social, and Emotional Learning [CASEL], 2015; OECD, 2015; Türk Sanayicileri ve İş İnsanları Derneği [TÜSİAD], 2019). Therefore, stakeholders should develop new plans in cooperation in order to eliminate the deficiencies in social-emotional learning, which is one of the development areas where children are most affected during the pandemic period. Another development area that was emphasized in the discussions was "motor development". The participants mentioned the regressions in gross motor skills, especially expressing that there are children who have difficulties in movement actions. Orgiles, Morales, Delvecchio, Mazzeschi and Espada (2020) concluded in their study that children spend less time on physical activity during the pandemic period. Other studies indicating a decrease in children's physical activity (Clarke et al., 2021; Cordovil et al., 2021; Fernandez-Ruiz, 2021; Göl-Güven et al.,2020; Kadan, 2021; López Bueno et al., 2021; OMEP, 2020) support these data. The opinions of the participants, who stated that they also saw some decline in cognitive development, language development, and self-care skills, are on the same side as other studies in the literature (Kadan, 2021; Ogelman et al., 2021). In consequence of these findings, it is possible to say that the pandemic period caused some negative effects on all development areas of pre-school children, especially social-emotional skills.

In the study, in which the effects of returning to face-to-face education after the pandemic period were explored, the second theme, which was reached based on the opinions of the participants, was examined under the title of "reflections of the child on the adaptation process to school". Even though the participants expressed their opinions that children came back to school with longing and excitement, they also mentioned that the

orientation process was difficult and that some behavioral disorders such as anxiety disorder were observed in children. In the study conducted by Bağçeli-Kahraman and Apak (2021), comparable results were obtained, and it was observed that some children returned with good feelings because they missed school, but some of them were negatively affected by the process and exhibited behavioral disorders during the adaptation process. Other studies in the literature also concluded that the COVID-19 period caused excessive and unreasonable crying, sadness, and anger problems (Alisinanoğlu, Karabulut & Türksoy, 2020; Konca & Çakır, 2021; Ok, et al., 2021; Özçevik & Ocakçı, 2020), especially in young children, and increased the anxiety and fear levels of children (Aral, Aysu & Kadan, 2020; Kadan, 2021; Vasileva et al., 2021). Teachers, especially parents, who are in contact with the child, need to guide children to understand and express their emotions. Another category to be covered under this theme was technology use. Some stakeholders stated that during the distance education process, it was a positive situation for children to meet with their teachers and friends, even if it was online, and their level of knowledge about technology use increased. In the studies conducted, it was found that the distance education process caused a lack of motivation in children (Garbe, Ogurlu, Logan & Cook, 2020), was not as efficient as face-to-face education (Gören, Gök, Yalçın, Göregen & Çalışkan, 2020), increased the inequalities of opportunity in education (Yıldız & Akar-Vural, 2020) , and also caused negative situations, in addition to its advantages such as protection from disease transmission, being able to attend the lesson regardless of time and place, and developing technological skills (Özdoğan & Berkant, 2020). In addition to that, the negative effects of the increase in the time of exposure to the screen during the pandemic period on children were expressed by some of the participants. Looking at the literature, many studies have been found that support the finding that children's screen exposure increased during the pandemic period (Bağçeli-Kahraman & Apak, 2021; Kadan, 2021; Kuru et al., 2020; Mart & Kesicioğlu, 2020; Orgiles et al., 2020). Based on all these, it is possible to say that the pandemic period extended the time that children were exposed to the screen, increased their anxiety and fear levels, and this was reflected in the return of children to face-to-face education as some behavioral disorders and a longer and more challenging time to adapt to school.

The most frequently mentioned subject of the participants was their observations on family-child relations, under the title of "reflections on child-school-family relations", which is another theme in the study. Many participants stated that they observed that both the child and the family experienced separation anxiety when returning to school because the family and the child spent longer time together during the pandemic period. At the same time, it was observed that states of anxiety occurred in children due to the inability of some parents to effectively manage the psychological effects of the pandemic (Kuru, et al., 2020). The families experienced both positive and negative experiences together in this process (Başaran & Aksoy, 2020). Looking at the literature, it was found that parents and children who cope with their emotions better in general, overcome the pandemic period more easily (Göl-Güven et al., 2021), while parents and children with a more strict parental attitude or negligent and protective attitude had a harder time (Bağçeli-Kahraman & Apak, 2021). Nonetheless, there are also studies stating that the increase in the time spent at home with the child caused families to communicate more with their children, play more games and diversify the activities they do with their children (Başaran & Aksoy, 2020). When the opinions of the participants on the school-family relationship were examined, the most attention-grabbing part was the observation that the cooperation of the families with the school increased. These opinions do not show parallelism with the findings of another research (Çakın & Külekçi-Akyavuz, 2020) that reached the data that parents did not support the school enough during the pandemic period. In another study, which stated that one of the most difficult aspects of the pandemic period for children was that children missed their friends and teachers, it was observed that children who could meet with their friends more, play games, and continue their daily routines overcame this process more easily (Gökçe, Erdoğan, Kızıl-Yatmaz, Avaroğlu, & Çok, 2021). Even though it is known that the daily routines at school and the interaction between children affected the process more positively, it was determined by other studies that games were preferred less in schools due to concerns about health, and

studies with large groups were less performed (Bağçeli-Kahraman & Apak, 2021). In the light of these data, it is possible to say that after a long period spent at home, separation anxiety increased in some parent-child relationships, children, whose routines had changed, experienced difficulty in adapting to school, but parents and children who could cope with their emotions overcame the process more easily..

Within the scope of the study conducted, most of the participants also proposed solutions in order to correct the problems they saw in this process. These proposed solutions were collected under the titles of "compulsory pre-school education" and "new teacher training program". The participants emphasized the importance of pre-school education and stated that they could see the difference much more clearly between the children who went to school and those who did not. Stakeholder opinions in other studies also support the idea that more emphasis should be placed on pre-school education (Ekinci & Bozan, 2019; Giren 2021). In the study conducted by Konca and Çakır (2021), the importance of continuing pre-school education during the pandemic period was stated. Studies about the importance of pre-school education show that the visual perception, mobility, and readiness for primary school children who receive pre-school education are at a much better level than children who do not receive pre-school education (Bozgün & Uluçınar Sağır, 2018; Çelenk 2008; Dinçer & Göktaş, 2019; Ercan & Aral, 2011; Pekdoğan & Kanak, 2018). Based on these scientific results, the justifications that pre-school education should be compulsory maintain their validity even after years passed. The necessity of compulsory pre-school education, which was discussed before the pandemic period came into our lives, is now even more important considering the educational losses and inequalities of opportunity of the disadvantaged groups that emerged during the pandemic period (İnan, 2020). As another proposed solution, the participants suggested that there should be a new teacher training program, and they agreed that it is necessary to increase the quality of education by multiplying the number of more competent teacher leader programs to the existing teacher training system so that teachers are better equipped. Keleş, Atay and Karanfil (2020) stated in their study that one of the solutions for the process should be training the teachers. Akın and Aslan (2021), on the other hand, stated that the online education process for pre-school children created anxiety, therefore, it should be well planned and mentioned that training may be needed on this subject. When we analyze the literature, it is possible to say that while some of the teachers did not find the teacher training applied in faculties under normal conditions sufficient (Güven & Kırat, 2021; Khizar, Muhammad & Mushtaq, 2019; Uzun, Paliç & Akdeniz 2013), it is necessary to review the teacher training program as a result of problems that arose in extraordinary situations such as pandemics. Then again, based on the knowledge that individuals with high ability to adapt to life changes have less difficulty facing any change that may occur in life, it is safe to say that it is necessary that both educators and family members should strive for the improvement of these skills and volunteer to receive training without the need for external guidance, taking into account the changing universal life conditions. In this context, it is recommended to increase the awareness of teachers about giving importance to children's emotions so that they can manage this process more healthily, and to make room for educational activities that support social-emotional development in order for children to express their emotions in the classroom. At the same time, it can be suggested to implement out-of-class educational activities in which children will interact with each other in accordance with their interests for their physical development. Teachers can perform some of the activities in the daily lesson plan with natural materials outside the classroom. They can spend their reading hours in the garden, and give plenty of space to movement activities such as playing ball and jumping rope. Similarly, it is recommended that families reduce the time their children spend in front of screens, increase the time they spend together, go on nature walks together, and talk more about their feelings with their children.

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The Influence of Using Material on Students' Success in 5th Grade Music Lesson*

Research Article

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ABSTRACT

This research was conducted to investigate whether the use of materials in 5th grade music lessons is effective on student achievement. In the study, quasi-experimental design with pretest-posttest matched control group was used. The research was carried out in a public secondary school located in Şahinbey district of Gaziantep province. The experimental and control groups of the study consisted of 60 students (n=60), 30 of whom were equivalent to each other in terms of their characteristics. Music Lesson Academic Achievement Test and expert opinion form developed by the researcher were used to collect data for the research. Within the scope of the research, a material-based activity program prepared by the researcher was applied to the experimental group and the data obtained as a result of the experimental application were analyzed with the SPSS 25.0 program. Dependent and independent sample t-tests were used in the analysis of the data. Cohen's d formula was used to calculate the effect size. As a result of the research; It was seen that the achievement test scores of the class in which music lessons were taught with material support were higher. Based on this, it was concluded that material-supported processing of music lessons was effective on students' success in music lessons.

Keywords:
Music education, material, material in music education, teaching material

Introduction

Considering the various definitions in the literature, education; starting before birth and continuing until death (Duman, 2013), To provide the knowledge, skills and vision for individuals to gain their place in society (TDK, 2019), It can be defined as the process of creating a desired behavior (Ertürk, 1979) that continues throughout life (Baytekin, 2011) with a plan and program in line with a purpose, without space limitations (Ünal & Ada, 2007). It can be defined as the process of creating a desired behavior (Ertürk, 1979) that continues

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throughout life (Baytekin, 2011) with a plan and program in line with a purpose. Music education is; It is the process of acquiring, developing and changing musical behavior by following a planned, regular and methodical path in line with certain purposes and for a certain goal, based on the individual's own musical life (Uçan, 1997).

People have many similar features as well as being separated from each other by an infinite number of differences. These characteristics can be physical, cognitive, psychological, social and cultural. While determining the education programs, first of all, common and similar features are taken as a basis, and the subject of differences is expected to be handled with the practices to be made during the lesson (Kuzgun & Deryakulu, 2014).

Every student is a different world. It is the task of teachers to discover them and develop their existing capacities. The duty of education is to increase student capacity to the highest level that can be reached (Yıldız, 2002). While doing this, it is important to discover the different characteristics of the students and to choose the right teaching methods, techniques and materials. However, discovering and dealing with each student requires certain conditions. Time and environment are the main ones. Some students learn better by seeing, some by hearing, some by watching, some by trying, and some by playing games. However, it is not possible in today's schools to prepare separate activities and course materials for each student and to devote time to each of them. Therefore, finding a way or a method that can activate as many senses as possible in the classroom environment, attract attention and motivate at the same time, allow to do activities and play educational games, and enable activities for each of the 8 intelligence types specified in the theory of multiple intelligences can be a solution to this problem. Considering all these, it can be thought that it is possible to create a lesson environment suitable for many of these criteria with well-prepared and well-chosen materials that can be used during the lesson.

Studies show that in case of providing appropriate materials and conditions, students' characteristics such as creativity improve, the learning environment is enriched and the quality of education increases (Yıldız, 2002).

Although situations such as the type of materials, usage situations, shape and quality features, adaptation to the conditions of the age and technological developments, teachers' ability to prepare and use materials constantly change and develop, educational materials have been included in education from past to present. While the materials were limited to textbooks, notebooks and blackboards with the influence of the educational approaches adopted in the past, today it is possible to come across a wide variety of planned and consciously prepared materials depending on the characteristics of variables such as teacher, student, subject, duration, environment and technological developments. The importance given to this issue is increasing day by day, while teacher candidates are given courses on educational technology and teaching material development as a course in universities, education assistants who are currently teaching are also supported with in-service training.

In line with the studies of Yıldız (2002), Gozutok (2004), Simsek (2007) and Yalın (2009), teaching materials on education; It helps the lesson to be interesting, to motivate students internally, to shorten the teaching time, to increase the quality of teaching, to enable the student to develop a positive attitude towards the subject and the learning process, to provide practice and repeatability for each student, to simplify difficult events and to embody abstract concepts. has been found to have a positive effect.

It is not possible for a single tool to serve all purposes. Just as there is no specific "best teaching method" in education, there is also no "best teaching tool" that can serve all purposes under all circumstances. For this reason, teachers should be able to choose the "most suitable" teaching material among teaching tools and materials that they think will serve the lesson best (Gözütok, 2004). Since not every teaching material has the

feature to meet all the conditions, it is highly likely that the material that can meet the most possible conditions, considering the existing materials, environment and tools, will be the most effective material (Yıldız, 2002). Since teachers have to work with students who have very different individual characteristics in the classroom environment, they should be able to choose the materials they will prepare and use very carefully and prepare the learning environment accordingly (Şimşek, 2007).

While choosing the teaching material; whether the material is capable of achieving the target acquisition, its support with scientific data, whether there is a guide or guide, its ability to provide meaningful support to the subject, its ability to direct students to think and criticize, its physical characteristics, transportation conditions, money, time and effort to be spent. should be questioned (Ergin, 1995).

There are many benefits and ease of using teaching tools and materials. However, in some cases, some limitations can be seen in the use of teaching materials. In some cases, the use of materials can get ahead of the subject, the purpose of the lesson, and the learning objectives. However, it should not be forgotten that "education is essential, not a tool. A tool is an element that supports education" (Şimşek, 2007). Considering this situation, it is thought that continuing the whole learning-teaching process dependent on the material or including it in order to have used it because we have a material in our hands, may cause negative results in terms of learning-teaching rather than benefit.

In the use of teaching materials; Storage and protection of materials, difficulties in obtaining materials in places where transportation and access are difficult, unexpected mishaps during the use of materials (power outage, etc.), not every student is in line for the use of materials in crowded classes, students look at the visual, color, pictures or images of the material rather than its function. There may be limitations such as the possibility of focusing more on the games in the materials used in educational games, and the difficulties that may be experienced in the use of teaching materials made by others. In order to minimize the limitations, it is necessary to know the processes such as material preparation, design and selection very well and to make applications in line with this information.

It is thought that, as the learning and teaching process is planned in the educational process, they should have plans specially prepared for them in their materials. The content of these plans may include the name of the material, its purpose, the age or learning group it addresses, the duration of use, the learning area, the learning outcomes, the necessary auxiliary materials and the implementation process. In addition, it is thought that it may be useful to include the information necessary for the production of the material for those who want to make the material. This information can also be given under the headings such as the materials required for material production and the stages of construction. While preparing the instructional material plan, it is thought that the titles given in figure 1 should be included in the content of the plan.

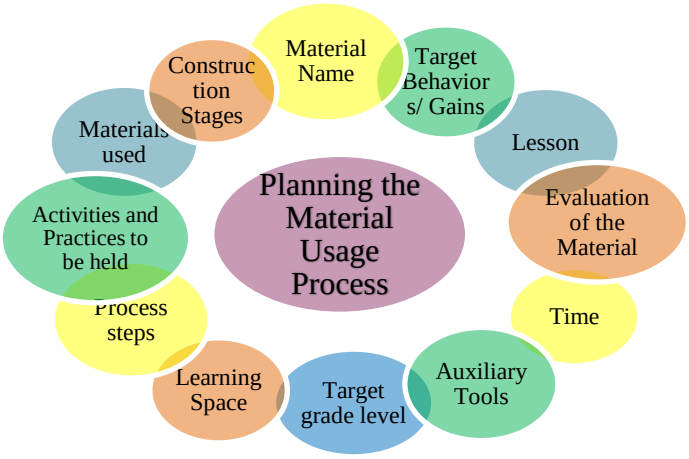

Figure 1. Information Required in the Teaching Material Plan

In order to ensure the correct and effective use of a training material by everyone, it may be recommended to prepare a user guide or guide for the material. The points to be considered in the preparation of such a guide can be expressed as follows;

• It should be clear, understandable and follow a meaningful and explanatory sequence,

• It should not contain excessive or incomplete information,

• Required warnings and notes should be prominently stated,

• If necessary, drawings or visuals related to material and material-based activities should be included,

• If the use of the material requires preliminary preparation, it should be specified,

• Information such as the age group addressed by the material, grade level, learning area, target acquisition and skills, and intended use of the material should be included,

• Information about the time required during the use of the material should be included,

• Various examples of activities that can be implemented with the material should be presented.

It is seen that classifications are made according to the place provided (Günay, Özdemir, 2012) or the quality of the material (Baytekin, 2011) regarding the classification of teaching materials. Considering all aspects, it is thought that teaching materials can be classified as follows.

1. Materials according to the usage stage in the course;

a. Entrance

b. Attracting Attention

c. motivation

d. Explanation

to. Summarizing

f. Evaluation

2. Materials according to the intended use;

a. For attention

b. For motivation

c. For the purpose of understanding the subject

d. For application-activity purpose

to. for illustration purposes

f. For assessment and evaluation (grading) purposes

g. For educational game playing

3. Materials according to the sense organ it affects

a. Image

b. Auditory

c. Both visual and auditory

d. Materials that appeal to more senses

4. Materials according to the form of supply

a. Made to order by master

b. Purchased

c. Teacher preparing a known material

d. Teacher designing a new material

to. Student preparing a known material

f. Student-developed and designed materials

g. Materials prepared with teacher-student cooperation

5. Other materials

a. Materials prepared using recycling

b. Digital materials.

The selection of teaching materials and the use of learning-teaching time is a need that needs to be considered, paid attention and given importance. In order for the course materials to provide the highest level of efficiency in the course process, the costs of using consumable consumption materials, production or selection results feed those who need to have more knowledge, skills, abilities and competencies.

Ünal and Ada (2007), based on the researches in the relevant literature, stated the effective teacher skills related to material use as follows:

Teachers;

• Should have the ability to diversify the teaching environment in a way that allows the active participation of the student,

• Must have the ability and ability to use technological tools such as films and projectors,

• Must have the ability to evaluate the suitability of the teaching material to be used.

One of the issues that teachers should pay attention to when using teaching materials in their classes is that the prepared materials are suitable for the conditions of the day. "The methods and tools used in educational institutions before the 1900s do not have the same effect on the teaching in the 2000s and beyond" (Baytekin, 2011). For this reason, it is thought that teachers should also pay attention to the fact that the materials they design, develop, prepare, choose or have their students make are up-to-date. The way to evaluate the actuality of the material is to follow the developments in many fields, especially in education, and to improve oneself. For this reason, it is thought that teachers should follow new and current developments.

Purpose and Importance of the Research

The aim of this research is to investigate whether the use of teaching materials in 5th grade music lessons is effective in terms of student success and to contribute to the field by giving sample materials and lesson plans that can be used in music lessons. For this purpose, the main problem of the research is "5. How effective is the use of teaching materials in classroom music education on student success? determined as.

With time, the stages such as choosing, designing, preparing and using teaching materials show a continuous development and change. Because teaching materials should be able to follow the age, be suitable for the student profile of the current period, compatible with the learning environment, serving the current curriculum and have an up-to-date quality. Considering all these, when the relevant literature is examined, it has been observed that the curriculum has changed, the old studies have lost their validity, and there are

deficiencies in keeping up with the current times. In order to eliminate these deficiencies, this study has been carried out with the thought that it will contribute to the related field. It is thought that the study is important considering the usability of the materials developed within the scope of the study, the suggested activity examples and measurement tools by music teachers, and the ability of the results obtained by examining the effect of material-supported music education on success, to improve the 'tools and materials' part of the music lesson curriculum.

Method

Model of the Research

In this study, in which the effects of the use of instructional materials in music education on the academic success of students in music lessons were examined, a pretest-posttest matched quasi-experimental design was used. In the pretest-posttest control group model, the experimental and control groups are created impartially so that they are equal to each other. In the next process, a pre-test is applied to both groups and their readiness status before the application is determined. Then, while an application is made to the experimental group, no action is taken to the control group. "All the variables are kept the same for the experimental and control groups, and only the application difference is created between the two groups". In the last stage, data is collected by applying a posttest to both groups (Tanriöğen:2012).

Table 1. Pretest-Posttest Paired Control Group Pattern

Grup	Identifying the Groups	Pretest	Process	Post-Test
G_d (Experiment)	M	$Ö_1$	X (Material supported music education)	S_1
G_k (Control)	M	$Ö_2$	X	S_2

In Table 1, Gd is the experimental group; Gk, control group; M indicates that 2 matched ready groups were randomly assigned to the experimental and control groups; S1 and S2, the pretest applied to the experimental and control groups; X refers to the experimental procedure applied to the experimental group students, and S1 and S2 refers to the posttest applied to the experimental and control group students.

Working Group

The research was carried out with two classes (N=60) determined among the 5th grades studying in a public school located in Şahinbey district of Gaziantep province. In order to determine the study group required for the experimental application among the 5th grades in which the research will be conducted, the music lesson grades of the students in the previous years were examined and the 5-C and 5-D classes, whose equivalence was determined as success level, were included in the study. The subject of which of these two paired groups would be included in the study as the experiment and which was the control group was decided by lot and the neutral assignment method was followed. As a result of the lottery, the 5-C group was determined as the control group, while the 5-D class was assigned as the experimental group.

Experimental Application and Data Collection Process

Before starting the experimental application process, necessary permissions were obtained from Gaziantep Governorship and Gaziantep Provincial Directorate of National Education through the Institute of Educational Sciences of Inonu University, and the application was made in the second term of the 2018-2019 academic year. In the first week of the experimental application process, which lasted for a total of 10 weeks, detailed information about the application, the suitability of the classroom environment, and the storage conditions of the materials were determined by meeting with the school administration and the students. In the second week, the student groups where the application will be made were determined, the students were

informed about the application process and daily lesson plans were prepared. In the third week, a pre-test was applied to measure the knowledge and readiness of the students on the subjects to be covered, and to collect data for the research at the same time. Between the fourth and ninth weeks, the subjects given in the 5th grade music curriculum were explained to both the experimental and control groups every week. While education was continued in the traditional way without using materials in the lessons taught in the control group, the subject was explained to the experimental group with the materials that were planned and prepared in advance every week. In the 10th week, a post-test was applied to both groups.

A personal information form was used in order to collect data about the demographic characteristics of the students who constitute the study group of the research. Form students; It includes questions about obtaining information such as age, gender, number of siblings, education level of parents, occupation of parents, monthly income of the family. In addition, the Music Lesson Academic Achievement Test was created to collect data by using it as a pre-test and post-test and to measure the success levels of the students in the study group. The test was prepared in the form of a multiple-choice test with 4 options, which was prepared for learning outcomes. Expert opinions of 2 academicians and 5 music teachers were consulted regarding the test's adequacy in measuring target achievements and its suitability for the student group. A pilot application was conducted to conduct validity and reliability studies of the test, which consists of 33 items in total. This test was applied to a total of 125 students in 4 classes selected from the 6th grades. Reliability studies of the test were done with SPSS package program, item analysis.

Analysis of Data

SPSS 25 statistical package program was used to evaluate the data. First, descriptive analysis and normality analysis studies were carried out. After it was determined that the data showed normal distribution, dependent sample t test and independent sample t test were used in the analysis processes. In order to calculate the effect size in line with the data obtained as a result of these tests, Cohen's d value was calculated and interpreted.

Findings

The first sub-problem of the study was "Is there a significant difference between the pretest scores of the experimental and control group students?" determined as. In order to obtain the data related to this sub-problem, the pretest data of the experimental group and the pretest data of the control group were analyzed by applying the independent sample t-test and the results were interpreted. The data regarding the analysis of the pretest data of the experimental and control groups are given in Table 2.

Table 2. Table of The Analysis of The Pre-Test Data of The Experimental and Control Groups

Pre-test	N	$\bar{X}$	ss	sd	t	p	Cohen's d
G_d	30	15,80	6,04	58	-,418	,678	-
G_k	30	16,50	6,90				

When the scores were examined, it was seen that there was no significant difference (p= .67), p>.05 between the pretest scores of the experimental group ($\bar{X}$=15.80) and the pretest scores of the control group ($\bar{X}$=15.50). From this point of view, it is concluded that the pretest scores are close to each other and the knowledge levels of the students in the experimental and control groups before the application are equal to each other.

The second sub-problem of the research is "Is there a significant difference between the pretest and posttest scores of the experimental group students to measure the course success?" determined as. In order to obtain the data related to this sub-problem, the pretest and posttest data of the experimental group students were analyzed by applying the dependent sample t test and the results were interpreted.

The data regarding the analysis of the pretest and posttest data of the experimental group are given in Table 13.

Pre-test Post-test	N	$\bar{X}$	ss	sd	t	p	Cohen's d
Gd	30	15,80	6,04	29	-56,48	,00	7,29
Gk	30	84,30	5,86				

When the pretest and posttest scores of the experimental group were examined, it was found that the posttest scores ($\bar{X}$=84.30) differed significantly from the pretest scores ($\bar{X}$=15.80) (p= .00); p<.05) and it is seen that this difference is in favor of posttest scores. The effect size was found to be quite large (Cohen's d= 7.29).

The third sub-problem of the research is "Is there a significant difference between the pretest and post-test scores of the control group students to measure the course success?" determined as. In order to obtain the data related to this sub-problem, the pretest and post-test data of the control group students were analyzed by applying the dependent sample t-test and the results were interpreted.

The data regarding the analysis of the pre-test and post-test data of the control group are given in Table 4.

Pre-test Post-test	N	$\bar{X}$	ss	sd	t	p	Cohen's d
Gd	30	16,50	6,90	29	-24,11	,00	3,11
Gk	30	60,20	13,55				

When the pre-test and posttest scores of the control group were examined, it was found that the post-test scores ($\bar{X}$=60.20) differed significantly from the pre-test scores ($\bar{X}$=16.50) (p= .00); p<.05) and it is seen that this difference is in favor of post-test scores. The effect size was found to be quite large. (Cohen's d= 3.11).

The fourth sub-problem of the study is "Is there a significant difference between the post-test scores of the experimental and control group students to measure the course success?" determined as. In order to obtain the data related to this sub-problem, the post-test data of the control group students were analyzed by applying the independent sample t-test and the results were interpreted.

The data regarding the analysis of the posttest data of the experimental and control groups are given in Table 5.

Post-test	N	$\bar{X}$	ss	sd	t	p	Cohen's d
Gd	30	84,30	5,86	39,48	8,93	,00	2,14
Gk	30	60,20	13,55				

When the pretest and posttest scores of the control group were examined, it was found that the posttest scores ($\bar{X}$=84.30) differed significantly from the pretest scores ($\bar{X}$=60.20) (p= .00); p<.05) and it is seen that this difference is in favor of posttest scores. It has been determined that the effect size is at a large level. (Cohen's d = 2.14).

When an examination is made other than the given sub-problems, the pretest and posttest scores of both the experimental and control groups are given in chart 1. According to the graph, it is seen that the scores of both the experimental and control groups increased at the end of the experimental period, but the increase in the achievement level of the experimental group was higher than that of the control group.

Graph 1. Graph of the pretest and posttest data of the experimental and control groups

Discussion, Conclusion and Recommendations

At the end of the experimental application process, there was an increase in the scores of both the experimental ($\bar{X}$experimentPretest=15.80, ,$\bar{X}$experimentPosttest=84.30) and the control group ($\bar{X}$controlPretest=16.50, ,$\bar{X}$controlPosttest=60.20), but the increase in the scores provided by the experimental group was observed in the control group. higher than that of the group. In addition, it is seen that the effect level of the difference (Cohen's d=7.29) in the experimental group, which teaches with material support, is higher than the effect level of the control group (Cohen's d= 3.11), which teaches in the traditional way. Based on this, it is concluded that the experimental group, who received music education with material support, was more successful than the control group, according to the post-test at the end of the experiment process. In addition, the following conclusions were reached on the subject;

• According to the information obtained from the sources as a result of the literature review, the use of materials provides many benefits in terms of the efficiency of the lesson,

• There are many materials that can be used in music lessons, and these deficiencies can be completed by designing, developing and producing the missing part by teachers,

• The constructivist approach on which today's education system is based is a very suitable system for material use,

• The students in the experimental group followed the lesson with more interest and were very willing to participate in the lesson and use the materials,

• The materials designed and produced by the researcher are efficient for students to learn related subjects,

• Student characteristics, subject, environment, etc. The materials prepared by the course teacher, who is the person who knows the conditions best, by taking these variables into account, have a great contribution to the teaching of the course.

There are studies published on many topics such as the use of materials in music education, material development, the effect of materials on academic achievement. Among these studies, the results obtained in

all of the studies examining the effect of the music course on academic achievement are in line with the result of this study. In the study conducted by Akarsu (2007) with 6th grade students, results were obtained showing that material-supported music lessons increase academic success. In addition, the availability of materials such as computer, overhead projector, slide projection, opaque projection, radio, cassette player, video compact disc (VCD), Digital Versatile Disc (DVD) in schools was determined according to the terms of the term in the study. Many of these materials are not even known by today's students and teachers, and are not used today. This situation reveals the importance of constantly updating the studies on educational material and making new studies. Similarly, in Dalmışlı's (2013) study, the success of the music lesson in the lessons using the material was higher than the group that took traditional music lessons, but it was seen that there was no change in the attitudes of the students towards the music lesson. Mert (2019), on the other hand, in his study aiming to measure the effects of technology-supported materials at the 7th grade level on the academic success of music lessons, concluded that the success of the material and the lesson group is higher, and that the use of auditory and visual perception together is effective in increasing success. In Bekdemir's (2019) study on the use of game materials in music lessons, it was found that the success levels of students who received material-supported lessons were similarly high, and that game materials also contributed positively to students' active participation in the lesson.

In Öztürk's (2004) study examining teachers' views on the use and development of materials in music lessons, it was concluded that the materials are very useful for students and teachers and provide many conveniences, but there are not enough materials in schools, and teachers cannot use the materials effectively.

When more recent studies are examined, it is seen that the materials are quite different, and electronic or digital materials have entered the educational environment. Gürman (2019), in his study in which he examined the opinions of teachers about the use of materials designed with Arduino in music lessons, stated that music teachers do not receive in-service training on material design, training such as Arduino is generally given to informatics teachers, for such reasons teachers do not have information and knowledge about preparing and using such materials. came to the conclusion that he had no idea. In addition, all of the teachers stated that the materials were interesting for students and could help make learning permanent.

Toyran (2021), with his work on writing the material of the Lavignac 2C solfege book in Braille alphabet for visually impaired music department students, draws attention to the fact that the use of the material provides benefits in a wide range of areas and can also be beneficial in solving problems.

Based on the information obtained as a result of the research, the following suggestions were developed;

• Effective use of teaching materials in music education should be given due importance.

• When using teaching materials in lessons, they should be prepared and used by obtaining information from valid sources, not random ideas. The principles of preparation and use of teaching materials, the properties of the materials, the teaching processes in which the materials are used, etc. Material design and use should be done by following this information.

• In-service training seminars on the design and use of instructional materials should be given to music teachers to raise awareness on this issue.

• Every music teacher should be able to effectively use the instruments that they have been trained during their undergraduate education as teaching materials.

• It has been determined that there is a lack of resource books on subjects such as the production, use and selection of teaching materials in music education, and it is thought that books and similar publications should be increased in this direction.

• In order to adapt the educational materials to the conditions of the age, publications should be produced by providing updates on the subject. Studies on digital materials should also be added to the literature.

• Studies should be conducted to prepare course materials for disabled individuals and they should be facilitated.

• Studies should be carried out to produce and develop new and original materials by using developments such as developing technology, digital platforms, and robotic coding.

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

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Ethics Committee Decision

This study does not require ethics committee approval as it was produced from a graduate study using 2018-2019 research data.

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Examining Tolerance Attitude Levels of Preservice Teachers in Terms of Various Variables

Research Article

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ABSTRACT

The aim of this study is to determine the tolerance attitude levels of preservice teachers in terms of various variables. The research was conducted in the survey model. The sample group consisted of first-year students attending the Faculty of Education at Fırat University in the 2019-2020 academic year. The entire population was included as the sample. A total of 489 students was included in the study. The "Teacher Candidates Tolerance Scale", developed by Gül and Alimbekov (2018) and adapted by Gül, Karataş, and Borkoev (2019) into Turkish were used as data collection tools in the study. During the data analysis, firstly, the Kolmogorov-Smirnov test was applied to determine whether the data were normally distributed or not. The independent samples t-test was used to compare the normally distributed data based on the variables of gender and preferring willingly their department, and the variance test was used to compare the data based on the variables of the department, mother's education level, father's education level, mother's profession, and father's profession. Mann Whitney U test was used to compare the data that were not normally distributed based on the variables of gender and preferring willingly their department. Kruskal Wallis H test was used to compare the data based on the variables of the department, mother's education level, father's education level, mother's profession and father's profession. The results of the study showed that both female and male preservice teachers had very high levels of tolerance attitudes. Preservice teachers who studied in the Department of Social Studies Teaching and preferred willingly their department had higher levels of tolerance attitudes.

Keywords:
Tolerance, attitude, preservice teacher

Introduction

Values directly or indirectly guide the behaviors of individuals. People develop values to achieve what they want by maintaining their personal and social lives, and break away from their worries, regulate social

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life and foster interpersonal loyalty (Sağlam, 2019: 47-60). Tolerance is one of the values that individuals have developed. The concept of tolerance, rumored to be based on the first human being as the world came into existence, is believed to have practically occupied a place in human life with the beginning of the human relations phenomenon, even though the theory does not include it (Uca, 2015: 23). In a time when people are becoming increasingly mechanized, one of the things we need most is to be tolerated and to be tolerant (Yaman, 2012: 99).

TLS (2022) defines tolerance as "the state of tolerating everything as much as possible by meeting everything with understanding, indulgence, and tolerance." Tolerance is to respectfully accept and appreciate the rich diversity of our world cultures, our forms of expression and our ways of being human. Tolerance, referring to compliance in differences, is nourished by knowledge, openness, communication and freedom of thought, conscience and belief (UNESCO, 1995: 9-10). Tolerance, a virtue that glorifies human beings and is unique to them, is listening to, understanding, and communicating with others by regulating their differences. The tolerance value regulates human and social life and improves the environment of mutual love, respect, and peace. Thus, it promotes the emergence of positive thoughts and feelings among individuals (Mutluer, 2015: 576-577). The tolerance value, regarded as a value that has a direct impact on human relations and social life, is very important for societies and individuals to live in peace and tranquility (Uca, 2015: 26). Tolerance is regarded as a quality that is built up in the process of lifelong socialization and manifests itself in various fields (Baklashova, Galishnikova and Khafizova, 2015: 335).

When tolerance is thought in intellectual and behavioral contexts, intellectual tolerance is based on words, but behavioral tolerance is based on actions. In other words, intellectual tolerance is to respect the expressions of an opinion that has not been turned into any behavior. Behavioral tolerance, on the other hand, is the ability to develop a positive attitude toward people's behaviors based only on their actions for which they do not know the motive (Gül, 2018: 15). The most frequently stressed concepts related to values are beliefs, tendencies, normative standards, and attitudes (Sağlam, 2019: 60). The tolerance value is an attitude that cares about everyone and every value, regulates human life based on peace and tranquility, embraces differences, and promotes the formation and development of positive thoughts and feelings among people (Uca, 2015: 34).

Passing on the values of society to the next generations is the duty of education, i.e., teachers. The behaviors of teachers represent the embodiment of values (Sağlam, 2019: 60-144). Teachers who want to bring about changes in students' values should model these values (Ulusoy and Dilmaç, 2012: 90). Today, the duty of formal education institutions is both to furnish students with the contemporary knowledge and technological information required by the time and to pass on values based on the moral judgments of society (Gül, 2018: 24). The acquisition of values and attitudes in both cognitive, emotional and behavioral dimensions enhances the quality of life of students at school. Thus, students feel both happier and safer at school. While students grow up as upright citizens with good character, they also effectively learn knowledge and skills they will use daily (MoNE, 2022).

Having the virtue of tolerance is important for all individuals in the world. However, the most fundamental value is that teachers who educate society should be tolerant. The primary characteristic of a teacher is to be affectionate and tolerant toward mistakes (Cingi & Çağlar, 2020: 22). The tolerance value holds great importance in the education of children (Yaman, 2012: 99). The education system and teachers have great duties in instilling the tolerance value to students (Mutluer, 2015: 577). Education that focuses on tolerance value aims to build values such as respect for others, solidarity, mutual support, embracing differences and establishing a tolerant attitude (Gutu & Boghian, 2019: 29). During this process, it is essential to know the opinions of teachers on tolerance education (Türe & Ersoy, 2015: 62).

Tolerance is attained through education, i.e., one of the objectives of education. The general aim of tolerance education is to build and promote tolerant attitudes, embrace diversity, expand the capacity for

active participation in social life, and acquire the competencies of recognizing and respecting human dignity (Gutu & Boghian, 2019: 29). Tolerance itself is neither a value that comes from birth nor from hereditary factors. Environmental factors are important for tolerance and it is learnt through experiences. Tolerance education is firstly taught by the family, the first educational sphere of the individual, and then at schools. A preservice teacher who holds tolerance values before he/she begins his/her profession will teach this value to the other party in the best way possible through the educational settings he/she would establish, the educational activities he/she would carry out and the positive behaviors he/she would instill in his/her students as a model (Uca, 2015: 26; Gündüz, 2019: 49). Tolerance—a humanitarian function in the construction of preservice teachers' value orientations and interests—is an important component of professionalism (Khitruk & Ulianova, 2012: 22). The attitudes of teachers, who are the key figures in the education of children, toward the tolerance value in the preservice period are crucial. Therefore, in this study, it is thought that examining the tolerance attitude levels of preservice teacher in terms of various variables will contribute to the field.

Aim

This study aims to determine preservice teachers' tolerance attitude levels by various variables. For this general purpose, answers to the following research questions were sought:

For the preservice teachers:

1. What is their level of tolerance attitude in general?

2. Do their opinions on the sub-dimensions of empathy, importance, compliance, and attitude and their attitudes toward tolerance, in general, differ by gender variable?

3. Do their opinions on the sub-dimensions of empathy, importance, compliance, and attitude and their attitudes toward tolerance, in general, differ by the department variable?

4. Do their opinions on the sub-dimensions of empathy, importance, compliance, and attitude and their attitudes toward tolerance, in general, differ by mother's education level variable?

5. Do their opinions on the sub-dimensions of empathy, importance, compliance, and attitude and their attitudes toward tolerance, in general, differ by the father's education level variable?

6. Do their opinions on the sub-dimensions of empathy, importance, compliance, and attitude and their attitudes toward tolerance, in general, differ by mother's profession variable?

7. Do their opinions on the sub-dimensions of empathy, importance, compliance, and attitude and their attitudes toward tolerance, in general, differ by the father's profession variable?

8. Do their opinions on the sub-dimensions of empathy, importance, compliance, and attitude and their attitudes toward tolerance, in general, differ by the variable of preferring willingly the department?

Method

In this section, information about design of the study, sample group, data collection tool and the data analysis are presented under sub-headings.

Design of the Study

The study was prepared according to the survey model. The survey model seeks to identify and define a case, event or object that exists in the past or present as it is under its own conditions (Karasar, 2016: 109). The survey model, which is to be conducted in the study to be conducted on this framework, will reveal the tolerance attitude levels of the preservice teachers in its simplest form.

Sample Group

The population of the study consisted of first-year students attending the Faculty of Education at Fırat University in the 2019-2020 academic year. Since the entire population is accessible, no further sample shall be selected, and the entire population shall be sampled. Accordingly, the sample group consisted of the first-year students of the Departments of Classroom Teaching, Art Teaching, Turkish Teaching, Mathematics Teaching, Social Studies Teaching, Preschool Teaching, Science Teaching, English Teaching, and Guidance and Psychological Counselling of the Faculty of Education at Fırat University in the 2019-2020 academic year. Table 1 provides information about the sample group.

Table 1. Information about the Sample Group

Department	Female	Male	Total
1. Classroom Teaching	42	17	**59**
2. Art Teaching	41	12	**53**
3. Turkish Teaching	31	20	**51**
4. Mathematics Teaching	44	10	**54**
5. Social Studies Teaching	26	19	**45**
6. Preschool Teaching	47	23	**70**
7. Science Teaching	29	5	**34**
8. English Teaching	39	21	**60**
9. Guidance and Psychological Counselling	47	16	**63**
Total	**346**	**143**	**489**

The sample group included 59 students from the Department of Classroom Teaching, 53 students from the Department of Art Teaching, 51 students from the Department of Turkish Teaching, 54 students from the Department of Mathematics Teaching, 45 students from the Department of Social Studies Teaching, 70 students from the Department of Preschool Teaching, 34 students from the Department of Science Teaching, 60 students from the Department of English Teaching, and 63 students from the Department of Guidance and Psychological Counselling. The sample group consisted of a total of 489 students, out of whom 346 were female and 143 were male.

Data Collection Tools

The "Teacher Candidates Tolerance Scale", which was developed by Gül and Alimbekov (2018) developed and was adapted into Turkish by Gül, Karataş and Borkoev (2019), was used in the study. This is a five-point Likert-type scale with 15 items. Teacher Candidates Tolerance Scale consists of four sub-dimensions: empathy (5), importance (4), compliance (3), and attitude (3). Cronbach's Alpha internal consistency coefficient of is 0.77 for the overall scale, 0.74 for the empathy sub-dimension, 0.69 for the importance sub-dimension, 0.70 for the compliance sub-dimension, and 0.67 for the attitude sub-dimension. The scale is rated on the following anchors: Strongly Disagree (1), Disagree (2), Undecided (3), Agree (4), and Strongly Agree (5). The highest and lowest scores of the scale are 75 and 15, respectively. The range from 63 to 75 points is interrupted as a "very high level of tolerance", 51 to 62 points as a "high level of tolerance", 39 to 50 points as a "moderate level of tolerance", 27 to 38 points as a "low level of tolerance" and 15 to 26 points as "intolerant".

Data Analysis

The Kolmogorov-Smirnov (K-S) normality test was applied to analyze whether or not the data were normally distributed since the sample group exceeded 50. Test results indicated that if the p-value is greater than 0.05, the data are normally distributed. If the p-value is less than 0.05, skewness and kurtosis values are analyzed since the data were not normally distributed. If the skewness and kurtosis values are between -2 and +2, it is deemed that the data are normally distributed (Büyüköztürk, 2007: 42; Kalaycı, 2010: 212; Yazıcıoğlu

& Erdoğan, 2014: 247; Büyüköztürk, Çokluk & Köklü, 2019: 59). Table 2 shows the Kolmogorov-Smirnov test for the overall scale and its sub-dimensions.

Table 2. Kolmogorov-Smirnov test results for the Teacher Candidates Tolerance Scale

	K-S	*p*	*Skewness*	*Kurtosis*
Empathy	3.302	0.000	-1.723	5.461
Importance	3.007	0.000	-1.049	2.358
Compliance	2.825	0.000	-0.734	0.501
Attitude	3.991	0.000	-1.316	2.622
Overall Scale	1.924	0.001	-1.558	5.963

Since only the compliance sub-dimension was normally distributed as a result of the Kolmogorov-Smirnov test, parametric tests were applied. The independent samples t-test was used to compare the opinions of the students based on the variables of gender and preferring willingly the department, and the analysis of variance was used to compare their opinions based on the variables of the department, mother's education level, father's education level, mother's profession, and father's profession. Since the sub-dimensions of empathy, importance, and attitude and the overall scale were not normally distributed, non-parametric tests were applied. Mann Whitney U test was used to compare the opinions of the students based on the variables of gender and preferring willingly the department. The Kruskal Wallis H test was used to compare their opinions based on the variables of the department, mother's education level, father's education level, mother's profession, and father's profession.

Findings And Remarks

In this section, the findings obtained as a result of the analysis of the data obtained and interpretations based on these findings are included. First, the findings regarding the tolerance attitude levels of preservice teacher are presented in Table 3:

Table 3. Tolerance attitude levels of the preservice teachers

	$\overline{X}$	*ss*
Gender		
Female	64.78	7.14
Male	63.52	9.03
Department		
Classroom Teaching	62.68	7.81
Art Teaching	65.04	5.95
Turkish Teaching	62.04	10.74
Mathematics Teaching	64.61	7.19
Social Studies Teaching	67.07	5.79
Preschool Teaching	64.54	9.35
Science Teaching	63.12	8.24
English Teaching	65.57	5.56
Guidance and Psychological Counselling	64.83	6.86
Total	**64.41**	**7.75**

When Table 3 is analyzed, it was found that the overall tolerance attitude level of the preservice teachers ($\overline{X}$ =64.41) was at a very high level. When analyzed based on the variable of gender, both female ($\overline{X}$ =64.78) and male ($\overline{X}$ =63.52) preservice teachers had very high levels of tolerance attitudes. When examined based on the variable of department, it was determined that the tolerance attitude levels of the preservice teachers who attended the Department of Classroom Teaching ($\overline{X}$ =62.68) and Turkish Teaching $\overline{X}$ (=62.04) were high,

while the tolerance attitude levels of the preservice teachers who attended the other departments were very high.

Table 4. Results of the independent groups t-test on the opinions of the preservice teachers based on the variable of gender

	Gender	*n*	$\bar{X}$	*ss*	*sd*	*t*	*p*
Compliance	Female	346	4.15	0.70	487	1.715	0.087
	Male	143	4.02	0.83			

The results of t-test in Table 4 showed that there was no significant difference in the opinions of the preservice teachers on the compliance sub-dimension [t (487) =1.715; p>0.05] based on the variable of gender.

Table 5. Results of Mann-Whitney U test on the opinions of the preservice teachers based on the variable of gender

	Gender	*n*	*Rank Mean*	*Rank Total*	*U*	*p*
Empathy	Female	346	246.85	85409.00	2.4104	0.649
	Male	143	240.53	34396.00		
Importance	Female	346	245.10	84805.50	2.4704	0.980
	Male	143	244.75	34999.50		
Attitude	Female	346	252.72	87441.50	2.2074	0.053
	Male	143	226.32	32363.50		
Overall Scale	Female	346	250.12	86543.00	2.2974	0.212
	Male	143	232.60	33262.00		

There was no significant difference in the opinions of the preservice teachers on the sub-dimensions of empathy (U=2.4104, p>0.05), importance (U=2.4704, p>0.05), and attitude (U=2.2074, p>0.05) and the overall scale (U=2.2974, p>0.05) based on the variable of gender.

Table 6. Results of analysis of Variance on the opinions of the preservice teachers based on the variable of department

	Department	*n*	$\bar{X}$	*ss*	*V.K.*	*K.T.*	*sd*	*K.O*	*F*	*p*	*LSD*
Compliance	Classroom Teaching	59	3.98	0.77	Intergroup	7.153	8	0.894	1.629	0.114	-
	Art Teaching	53	4.30	0.62	Intragroup	263.404	480	0.549			
	Turkish Teaching	51	3.90	0.89	Total	270.556	488				
	Mathematics Teaching	54	4.08	0.68							
	Social Studies Teaching	45	4.24	0.87							
	Preschool Teaching	70	4.15	0.80							
	Science Teaching	34	4.01	0.65							
	English Teaching	60	4.08	0.65							
	Guidance and Psychological Counselling	63	4.22	0.74							

Table 6 showed that there was no significant difference [F (8-488) =1.629; p>0.05] between the opinions of the preservice teachers on the compliance sub-dimension in terms of the variable of department according to result of the analysis of variance. However, when the arithmetic means were examined, the highest level of compliance was detected in the preservice teachers from the Department of Art Teaching ($\bar{X}$ =4.30) and the lowest level of compliance was detected in the preservice teachers from the Department of Turkish Teaching ($\bar{X}$ =3.90).

Table 7. Results of Kruskal Wallis H test on the opinions of the preservice teachers based on the variable of department

	Department	*n*	*Rank Mean*	*sd*	*KWH*	*p*	*Difference*
Empathy	Classroom Teaching	59	216.80				
	Art Teaching	53	239.03				
	Turkish Teaching	51	215.27				
	Mathematics Teaching	54	253.31				5-1,2,3,6,7,9
	Social Studies Teaching	45	296.99	8	18.615	0.017*	8-1,3,7,9
	Preschool Teaching	70	240.73				
	Science Teaching	34	212.57				
	English Teaching	60	286.76				
	Guidance and Psychological Counselling	63	238.71				
Importance	Classroom Teaching	59	200.86				
	Art Teaching	53	255.36				
	Turkish Teaching	51	238.84				
	Mathematics Teaching	54	235.78				
	Social Studies Teaching	45	281.03	8	11.763	0.162	-
	Preschool Teaching	70	263.65				
	Science Teaching	34	239.93				
	English Teaching	60	258.85				
	Guidance and Psychological Counselling	63	233.60				
Attitude	Classroom Teaching	59	217.42				
	Art Teaching	53	228.61				
	Turkish Teaching	51	226.27				
	Mathematics Teaching	54	252.40				
	Social Studies Teaching	45	295.53	8	11.798	0.160	-
	Preschool Teaching	70	255.12				
	Science Teaching	34	244.09				
	English Teaching	60	232.80				
	Guidance and Psychological Counselling	63	258.21				
Overall Scale	Classroom Teaching	59	205.20				
	Art Teaching	53	250.54				
	Turkish Teaching	51	220.92				
	Mathematics Teaching	54	244.56				
	Social Studies Teaching	45	297.48	8	14.241	0.076	-
	Preschool Teaching	70	258.97				
	Science Teaching	34	222.56				
	English Teaching	60	251.88				
	Guidance and Psychological Counselling	63	250.04				

Table 7 showed that there was a significant difference only in the empathy sub-dimension in terms of the variable of department according to result of the KWH test [KWH (8) =18.615; $p<0.05$). The difference was detected between the preservice teachers from the Department of Social Studies Teaching (SO: 296.99) and those from the Departments of Classroom Teaching (SO: 216.80), Art Teaching (SO: 239.03), Turkish Teaching (SO: 215.27), Preschool Teaching (SO: 240.73), Science Teaching (SO: 212.57) and Guidance and Psychological Counselling (SO: 238.71). The difference was detected between the preservice teachers from English Teaching (SO: 286.76) and those from the Departments of Classroom Teaching (SO:216.80), Turkish Teaching (SO: 215.27), Science Education (SO: 212.57) and Guidance and Psychological Counselling (SO: 238.71). When the

rank means were assessed in general, the highest level of attitude was determined in the preservice teachers in the Department of Social Studies Teaching in both the sub-dimensions of empathy, importance and attitude and in the overall scale, while the lowest level of attitude was recorded in the preservice teachers in the Department of Social Studies Teaching, and the lowest level of attitude was detected in the preservice teachers in the Department of Classroom Teaching.

Table 8. Results of analysis of variance test on the opinions of the preservice teachers based on variable of mother's education level

	Mother's Education Level	*n*	$\bar{X}$	*ss*	*V.K.*	*K.T.*	*sd*	*K.O.*	*F*	*p*	*LSD*
Compliance	Illiterate	82	4.07	0.80	Intergroup	2.792	5	0.558	1.007	0.413	-
	Only Literate	66	4.23	0.71	Intragroup	267.764	483	0.554			
	Primary School	158	4.10	0.68	Total	270.556	488				
	Secondary School	78	4.20	0.76							
	High School	71	3.99	0.80							
	University	34	4.11	0.79							

Table 8 showed that there was no significant difference [F(5-488)=1.007; p>0,05] between the opinions of the preservice teachers on the compliance sub-dimension in terms of the variable of mother's education level according to result of the analysis of variance. However, when the arithmetic means were examined, it was found that the highest level of compliance appeared in preservice teachers with mothers who were only literate ($\overline{X}$ =4.23), while the lowest level of compliance was observed in preservice teachers with mothers who were high school graduates ($\overline{X}$ =3.99).

Table 9. Results of Kruskal Wallis H test on the opinions of the preservice teachers based on the variable of mother's education levels

	Mother's Education Level	*n*	*Rank Mean*	*sd*	*KWH*	*p*	*Difference*
Empathy	Illiterate	82	226.09	5	3.982	0.552	-
	Only Literate	66	261.70				
	Primary School	158	249.81				
	Secondary School	78	254.42				
	High School	71	228.63				
	University	34	248.41				
Importance	Illiterate	82	246.38	5	0.365	0.996	-
	Only Literate	66	251.47				
	Primary School	158	240.15				
	Secondary School	78	245.29				
	High School	71	246.18				
	University	34	248.50				
Attitude	Illiterate	82	257.11	5	5.189	0.393	-
	Only Literate	66	270.95				
	Primary School	158	240.93				
	Secondary School	78	241.28				
	High School	71	222.26				
	University	34	240.32				
Overall	Illiterate	82	242.72	5	2.953	0.707	-
	Only Literate	66	268.05				
	Primary School	158	240.83				

	Secondary School	78	249.93
	High School	71	228.86
	University	34	247.54

Table 9 indicated that there was no significant difference in the sub-dimensions of empathy, importance, and attitude and in the overall scale in terms of the mother's education level variable according to result of the KWH test. When the rank means were analyzed in general, the highest attitude level in both empathy, importance and attitude sub-dimensions and overall scale was observed in preservice teachers with mothers who were only literate. The lowest level of attitude was found in the pre-service teachers whose mothers were illiterate in the empathy sub-dimension, whose mother was a primary school graduate in the importance sub-dimension, and whose mothers were high school graduates in the attitude sub-dimension and the scale in general.

Table 10. Results of analysis of variance test on the opinions of the preservice teachers based on the variable of father's education level

	Father's Education Level	***n***	$\bar{X}$	***ss***	***V.K.***	***K.T.***	***sd***	***K.O.***	***F***	***p***	***LSD***
Compliance	Illiterate	16	4.23	0.51	Intergroup	4.940	6	0.823	1.494	0.178	-
	Only Literate	23	3.88	1.00	Intragroup	265.617	482	0.551			
	Primary School	119	4.11	0.71	Total	270.556	488				
	Secondary School	95	4.25	0.74							
	High School	121	4.14	0.70							
	Associate's Degree	29	4.10	0.72							
	Bachelor's Degree	86	3.98	0.81							

Table 10 showed that there was no significant difference [F(6-488)=1.494; p>0,05] between the opinions of the preservice teachers on the compliance sub-dimension in terms of the variable of father's education level according to result of the analysis of variance. The highest level of compliance was observed in preservice teachers with fathers who held secondary school ($\overline{X}$ =4.25), while the lowest level of compliance was detected in preservice teachers with fathers who were only literate ($\overline{X}$ =3.88).

Table 11. Results of Kruskal Wallis H test on the preservice teachers' opinions based on the variable of father's education level

	Father's Education Level	***n***	***Rank Mean***	***sd***	***KWH***	***p***	***Difference***
Empathy	Illiterate	16	236.75	6	4.759	0.571	-
	Only Literate	23	251.07				
	Primary School	119	252.68				
	Secondary School	95	258.34				
	High School	121	248.03				
	Associate's Degree	29	238.16				
	Bachelor's Degree	86	217.60				
Importance	Illiterate	16	241.19	6	7.056	0.316	-
	Only Literate	23	243.30				
	Primary School	119	254.14				
	Secondary School	95	272.25				
	High School	121	232.49				
	Associate's Degree	29	220.81				
	Bachelor's Degree	86	229.16				

Attitude	Illiterate	16	261.62				
	Only Literate	23	233.98				
	Primary School	119	258.99				
	Secondary School	95	247.37	6	5.678	0.460	-
	High School	121	250.27				
	Associate's Degree	29	243.45				
	Bachelor's Degree	86	215.99				
Overall Scale	Illiterate	16	251.66				
	Only Literate	23	239.59				
	Primary School	119	253.78				
	Secondary School	95	268.93	6	7.442	0.282	-
	High School	121	242.05				
	Associate's Degree	29	232.79				
	Bachelor's Degree	86	214.89				

Table 11 indicated that there was no significant difference in the sub-dimensions of empathy, importance, and attitude and in the overall scale in terms of the variable of father's education level according to result of the KWH test. When the rank means were analyzed in general, it was determined that the highest attitude level in the sub-dimensions of empathy and importance and overall scale was observed in the preservice teachers with fathers who were secondary school graduates, while the highest attitude level in the attitude sub-dimension was detected in the preservice teachers with illiterate fathers. While the lowest level of attitude was seen in the empathy and attitude sub-dimension and the teacher candidates whose fathers had a bachelor's degree in general, it was observed in the pre-service teachers whose fathers were associate's degree graduates in the importance sub-dimension.

Table 12. Results of the independent groups t-test on the opinions of the preservice teachers based on the variable of mother's profession

	Mother's Profession	***n***	$\bar{X}$	***ss***	***sd***	***t***	***p***
Compliance	Working	45	4.19	0.61	487	-0.694	0.488
	Housewife	444	4.10	0.76			

According to the t-test results in Table 12, the opinions of the pre-service teachers regarding the compliance sub-dimension were [t(487)=-0.694; p>0.05], there was no significant difference in terms of mother's profession variable.

Table 13. Results of Mann-Whitney U test on the opinions of the preservice teachers based on the variable of mother's profession

	Mother's Profession	***n***	***Rank Mean***	***Rank Total***	***U***	***p***
Empathy	Working	45	272.44	12260.00	8.7553	0.167
	Housewife	444	242.22	107545.00		
Importance	Working	45	272.27	12252.00	8.7633	0.170
	Housewife	444	242.24	107553.00		
Attitude	Working	45	259.77	11689.50	9.3263	0.449
	Housewife	444	243.50	108115.50		
Overall Scale	Working	45	269.17	12112.50	8.9023	0.228
	Housewife	444	242.55	107692.50		

According to the results of the MWU test in Table 13, it was revealed that there was no significant difference in the empathy, importance and attitude sub-dimension and the mother's profession variable in the scale in general. In general, both in the sub-dimensions and in the importance scale, in which the mean rank is evaluated, it is seen that the preservice teacher whose mothers are working have a higher attitude level than the preservice teacher whose mother is a housewife.

Table 14. Results of analysis of variance test on the opinions of the preservice teachers based on the variable of father's profession

	Father's Profession	*n*	$\bar{X}$	*ss*	*V.K.*	*K.T.*	*sd*	*K.O.*	*F*	*p*	*LSD*
Compliance	Civil servant	104	4.14	0.74	Intergroup	6.830	6	1.138	2.081	0.054	-
	Shopkeeper	68	4.21	0.67	Intragroup	263.726	482	0.547			
	Worker	17	4.25	0.58	Total	270.556	488				
	Farmer	22	4.20	0.74							
	Retired	44	4.36	0.67							
	Self-employed	84	4.06	0.84							
	Unemployed	150	3.98	0.75							

Table 14 shows that there was no significant difference [F (6-488) =2.081; p>0.05] between the opinions of the preservice teachers on the compliance sub-dimension in terms of the variable of father's profession according to result of the analysis of variance. When the arithmetic means were assessed, it was found that the highest level of compliance appeared in preservice teachers with retired fathers ($\bar{X}$ =4.36), while the lowest level of compliance was observed in preservice teachers with unemployed fathers ($\bar{X}$ =3.98).

Table 15. Results of Kruskal Wallis H test on the opinions of the preservice teachers based on the variable of father's profession

	Father's Profession	*n*	*Rank Mean*	*sd*	*KWH*	*p*	*Difference*
Empathy	Civil servant	104	244.99	6	2.823	0.831	-
	Shopkeeper	68	238.41				
	Worker	17	257.18				
	Farmer	22	266.16				
	Retired	44	271.61				
	Self-employed	84	240.61				
	Unemployed	150	238.17				
Importance	Civil servant	104	240.38	6	11.019	0.088	-
	Shopkeeper	68	255.20				
	Worker	17	279.03				
	Farmer	22	298.07				
	Retired	44	273.81				
	Self-employed	84	249.54				
	Unemployed	150	220.95				
Attitude	Civil servant	104	239.43	6	10.623	0.101	-
	Shopkeeper	68	232.54				
	Worker	17	235.26				
	Farmer	22	297.93				
	Retired	44	285.76				
	Self-employed	84	257.02				
	Unemployed	150	229.16				

Overall Scale	Civil servant	104	244.39	6	11.360	0.078	-
	Shopkeeper	68	244.74				
	Worker	17	263.53				
	Farmer	22	292.30				
	Retired	44	292.05				
	Self-employed	84	244.82				
	Unemployed	150	222.80				

Table 15 indicated that there was no significant difference in the sub-dimensions of empathy, importance and attitude and in the overall scale in terms of the father's profession variable according to result of the KWH test. When the rank means were analyzed in general, it was determined that the highest attitude level was observed in the preservice teachers with fathers who were farmers in the sub-dimensions of importance and attitude and overall scale, while the highest attitude level was detected in the preservice teachers with retired fathers in the empathy sub-dimension. The lowest altitude level was found in preservice teachers with unemployed fathers in the sub-dimensions of empathy, importance, and attitude and overall scale.

Table 16. Results of the independent groups t-test on the opinions of the preservice teachers based on the variable of preferring willing the department

Preferring willing the department		***n***	$\overline{X}$	***ss***	***sd***	***t***	***p***
Compliance	Yes	362	4.19	0.68	487	3,843	0.000*
	No	127	3.90	0.86			

The t-test results in Table 16 showed that there was a significant difference in the opinions of the preservice teachers on the compliance sub-dimension [t (487) =3.843; p< 0.05] based on the variable of preferring willingly the department. The level of compliance of the preservice teachers who willingly preferred their department ($\overline{X}$ =4.19) was higher than the level of compliance of the preservice teachers who unwillingly preferred their department ($\overline{X}$ =3.90).

Table 17. Results of the Mann-Whitney U test on the opinions of the preservice teachers based on the variable of preferring willing the department

Preferring willing the department		***n***	***Rank Mean***	***Rank Total***	***U***	***p***
Empathy	Yes	362	254.81	92242.50	1.9434	0.009*
	No	127	217.03	27562.50		
Importance	Yes	362	250.44	90659.00	2.1024	0.147
	No	127	229.50	29146.00		
Attitude	Yes	362	248.39	89918.00	2.1764	0.356
	No	127	235.33	29887.00		
Overall Scale	Yes	362	254.58	92156.50	1.9524	0.011*
	No	127	217.70	27648.50		

Table 17 showed that there was a significant difference in the opinions of the preservice teachers only on the empathy sub-dimension (U=2.4104, p>0.05), and the overall scale (U=1.9524, p< 0.05) based on the variable of preferring willingly the department. The attitude levels of the preservice teachers who willingly preferred their department were higher both in the empathy sub-dimension and in the overall scale.

Discussion and Conclusion

In the study, the tolerance attitude levels of the preservice teachers were examined based on various variables. It was first found that the tolerance attitude levels of both female and male preservice teachers were at a very high level. Similarly, Gül and Alimbekov (2020) came to the conclusion in their study that the tolerance levels of the preservice teachers were quite high. Similarly, in the study by Polat (2022) it was determined that the tolerance levels of the preservice teachers were high. In the study by Uca (2015) it was also found that the tolerance levels of preservice teachers were very high. Gündüz (2019) concluded that the tolerance levels of preservice teachers were close to high.

Another result of the study was that there was no significant difference in the tolerance attitude levels of the preservice teachers based on the variable of gender. However, when the arithmetic means were analyzed, it was observed that both empathy, importance, compliance and attitude levels of female preservice teachers and their overall tolerance attitude levels were higher than levels of their male counterparts. Similarly, in the study by Gündüz (2019) it was concluded that female preservice teachers held higher levels of tolerance than male preservice teachers since their emotional structures, mother's instinct and feelings are stronger. Polat (2022) also concluded that the tolerance levels of female preservice teachers were higher than the levels of their male counterparts.

When the effect of the department on the tolerance attitude level of the preservice teachers was examined, no significant difference was determined. However, when the arithmetic means were analyzed, it was found that the tolerance attitude level of the preservice teachers who attended the Department of Social Studies Teaching was higher than levels of those attending the other departments. When the sub-dimensions were analyzed, a significant difference was found only in the empathy sub-dimension. The difference was found between the preservice teachers who attended the Departments of Social Studies Teaching and the preservice teachers who attended the Departments of Classroom Teaching, Art Teaching, Turkish Teaching, Preschool Teaching, Science Teaching, and Guidance and Psychological Counselling; as well as between the preservice teachers who attended the Department of English Teaching and the preservice teachers who attended the Departments of Classroom Teaching, Turkish Teaching, Science Teaching and Guidance and Psychological Counselling. When the arithmetic means were analyzed in terms of the sub-dimensions, the highest level of compliance was found in the Department of Art Teaching; whereas, the highest levels of empathy and attitude were found in the Department of Social Studies Teaching. Social studies teachers play an important role in citizenship education and therefore in tolerance education (Türe & Ersoy, 2015: 62). It is highly important for social studies teachers to teach the tolerance value to students in their lessons (Mutluer, 2015: 578). Therefore, it is expected outcome that the tolerance attitude levels of the preservice teachers of social studies were higher than the levels of those attending the other departments.

When the effect of the parents' education level on the tolerance attitude level of the preservice teachers was examined, no significant difference was determined. However, when the arithmetic means were analyzed, the preservice teachers with mothers who were only literate were found to have higher general tolerance attitudes levels. When the sub-dimensions were analyzed, the preservice teachers with mothers who were only literate had higher levels of empathy, compliance, importance, and attitude. Considering the father's education level, the general tolerance attitude levels of the preservice teachers with fathers who were secondary school graduates were higher. In the context of sub-dimensions, the empathy, compliance and importance levels of teacher candidates whose fathers are secondary school graduates; On the other hand, it is seen that the attitude levels of teacher candidates whose fathers are illiterate are higher. When the effect of the parents' professions on the tolerance attitude level of the preservice teachers was examined in the study, no significant difference was observed. However, when the arithmetic averages are examined, the level of tolerance attitude of teacher candidates whose mothers are working has been found to be higher. When

evaluated in the context of sub-dimensions, the levels of empathy, compliance, importance and attitude of teacher candidates whose mothers were working were higher. Considering the father's profession, the tolerance attitude level of the preservice teachers with fathers who were farmers was higher. As for the sub-dimensions, it was determined that the empathy and compliance levels of the preservice teachers with retired fathers were higher, while the importance and attitude levels of the preservice teachers with fathers who were farmers were higher. The effects of parents on the passing of values are essential. This is because values are first developed through role models such as parents and teachers (Sağlam, 2019: 144). The behaviors and attitudes that children are exposed to in the family affect their social development and values (Aktepe, 2016: 85). Values such as love, respect, tolerance, hospitality, responsibility, justice, honesty, solidarity, sensitivity, trust and solidarity are instilled in children by keeping them alive in the family (Nalçacı, 2019: 193). Since tolerance is a value attained during childhood, the family is an important variable (Utkugün & Yazıcı, 2019: 30). Accordingly, it is an expected outcome that the parents' education level and professions would affect the tolerance value and attitude level of their children.

Consequently, it was concluded that the tolerance attitude levels of the preservice teachers who willingly preferred their department were higher than the levels of the others. As for the sub-dimensions, it was determined that the empathy and compliance levels of the preservice teachers who willingly preferred their department were higher than levels of the others.

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The Relationship Between Self-Efficacy and Collective Efficacy Perceptions of Primary Teachers

Research Article

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ABSTRACT

The aim of this research is to determine the self-efficacy and collective efficacy levels of primary teachers and the relationship between these competences. For this purpose, 314 primary teachers working in the city center of Batman in the 2021-2022 academic year were taken as a sample to represent the universe. During the data collection process, the Teacher Self-Efficacy scale developed by Tschannen-Moran and Hoy (2001) and adapted into Turkish by Çapa, Çakıroğlu and Sarıkaya (2005), and Collective Efficiency scale developed by Goddard, Hoy and Woolfolk-Hoy (2000) and adapted into Turkish by Kurt (2009) scale were used. By looking at the distribution and homogeneity of the data obtained during the analysis of the data, t-test independent of parametric tests, one-way analysis of variance, Pearson Product-Moment Correlation analysis and Mann Whitney U test, one of the nonparametric tests, were used. As a result of the research, it was revealed that there is a low level of relationship between the professional self-efficacy levels of primary teachers and their collective efficacy perceptions. In addition, while the professional self-efficacy and collective efficacy of teachers do not reveal a significant difference according to the gender variable, it is seen that there is a significant difference according to the experience variable.

Keywords:
Primary teacher, self-efficacy, collective efficacy,

Introduction

A society needs to have various policies in order to have a qualified education system with the desired outputs. In order for these, the society needs the existence of systematic structures to implement these policies. For example, the states establish the schools to respond to these needs, as schools are an educational organization that works and processes to produce services for people and whose input and output is human (Şişman, 1995). In addition, schools exist to contribute to learning and provide services to community members

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(Diş & Akbaşlı, 2019). A qualified education can make it possible to reveal the talents and to transfer the innovations, social responsibilities desired and needed by the society to the learners (Tezcan, 1998). The ability of the schools to provide qualified outputs or to bring the qualifications to higher levels depends on their capacity building. Teachers make up the most important workforce of educational institutions and schools. Such that the qualification and competence of the teacher is the most important factor in the success of educational activities (Büyükkaragöz, Musta & Yılmaz, 1998).

Competence is knowledge, skills and attitudes possessed in order to exhibit the desired behaviors (Balcı, 2021). It is seen that the proficiency expected from teachers is defined in Turkey. These professional competencies are grouped under three competencies: professional knowledge, professional skills, attitudes, and values (MoNE, 2017). In order for these competencies to be gained, teachers are subjected to training during the pre-service and in-service education process from the moment they start for their undergraduate degree. Besides these, the competencies of the teachers and the belief in coping with the problems can also affect the teaching process. This points to the importance of the self-efficacy level as much as the individual competences. For instance, individuals with high level of self-efficacy are resistant to difficulties and can cope with stress and depression more, while individuals with low level of self-efficacy exhibit anxiety and avoidance behaviors (Kahraman & Çelik, 2019). Because self-efficacy is the individual's power to do the job s/he wants to do (Bandura, 1977). Self-efficacy for the teaching is defined as an ability to organize and implement a teaching action (Kahraman & Çelik, 2019; Kızılırmak, 2018). In fact, teacher self-efficacy belief is associated with the amount of effort spent by the teacher for student success, teachers' classroom management skills, method selection, and teaching process (Benzer, 2011). The studies in the literature supports the effect of teacher self-efficacy perception on teacher's personal development, lesson preparation process and in-class activities as well (Ocak, Ocak, & Kalender, 2017; Ayra & Köşterelioğlu, 2015; Telef, 2011). Based on this situation, it is possible to conclude that the professional self-efficacy of the teacher enhances the dedication to the profession and the quality of the outputs in the teaching process. However, the school has an organizational structure. For this reason, each individual in the school should act as a team in cooperation for the purposes determined in accordance with the organizational structure. The school is not only affected by the professional competence levels of teachers but also by the efficacy, self-efficacy and even collective efficacy levels of all members of the school, and how all employees working at the school relate to each other. The quality of the relationship networks of all stakeholders connected to the education system, such as teachers, students and parents in school organizations, depends on the values and perceptions of these stakeholders (Ortiz, 2001). For this reason, the relationship between employees, if the needs are met, is very effective in achieving organizational goals (Bilgen, 1990). In particular, the beliefs of school stakeholders to each other stand out as an important variable affecting this situation. Because the interaction between school stakeholders and the interaction that emerges because of this interaction is a determinant variable for the success of the institution. The common stance and interaction level of all individuals working in the school institution, not only the teachers can explain this. In that the behaviors perceived and adopted by the staff at the school reveal the school climate (Arslan, 2004). Goddard et al. (2004) mention that the feature that emerges with the interaction between the school stakeholders is more than the sum of the school stakeholders. With this perspective, S/he highlights the need to consider the influence of other stakeholders and the need to act together in the schools. The combined strength of the group, namely the collective efficacy of the teachers, in overcoming the problems that may be experienced in the success of the students and in the teaching process, can positively affect the job satisfaction in the school environment (Demir, 2019).

Collective efficacy is the belief shared in achieving a group's goals (Maddux, 2002). Collective teacher efficacy is associated with student success and school effectiveness (Tarter & Hoy, 2004). However, collective efficacy affects teachers' determination to try new methods for students to coping with difficulties in the teaching process (Tschannen-Moran, Salloum & Goddard, 2015). Based on these definitions, we can define

collective efficacy in the teaching process as a teacher's belief that provides each individual with the opportunity to learn, improves school success, and ensures the teachers' beliefs to spend efforts. Brison and Steiner (2007) support this definition with their view that teachers with collective efficacy improve the negative effects of disadvantaged students in the teaching process, increase the relationship between parents and teachers, and increase fidelity to school. Collective efficacy reflects teachers' belief that students can make a positive difference in the teaching process (Schechter & Tschannen-Moran, 2006; Goddard, Hoy & Hoy, 2004; Enochs & Riggs 1990). Teachers, with this belief, can affect the school structure and the teaching process. In fact, since a social system forms the school structure, interactions between teachers can affect teachers' attitudes and behaviors towards school (Yüner & Özdemir, 2020). Because teachers develop collective efficacy beliefs by evaluating other teachers' experiences, professional skills, and teachers' ability to teach students (Larrick, 2004). The collective efficacy of teachers and the environment surrounded by this efficacy belief enable to go beyond individual effort in the teaching process. The feature that emerges with the interaction of the members of a group is more than the sum of the effect of the group members (Goddard et al., 2004). This situation can reveal the general situation of the entire school and the efficiency of the school instead of the individuals working in the school. It can even ensure the questioning and taking necessary measures to improve ethics of schools (Yılmaz & Turanlı, 2017).

Organizational climate is defined as the interpretation and perception of each other by the employees of the organization (Moran & Volkwein, 1992). Therefore, both the professional self-efficacy levels of teachers and their collective efficacy beliefs can affect the teaching process and school climate. Although self-efficacy and collective efficacy are unfamiliar concepts, they are based on the same basis (Bandura, 2002). Based on this, teachers' professional self-efficacy and collective efficacy

may be related concepts (Demir, 2019; Skaalvik & Skaalvik, 2007). Considering this, this study aimed to determine the relationship between professional self-efficacy perceptions of teachers and their collective efficacy perceptions. In addition, this study also aimed to determine teachers' professional self-efficacy and collective efficacy perceptions in terms of certain variables (gender, age, seniority, educational status, etc.).

Methodology

The Research Design

This study is based on a correlational survey model, one of the quantitative research design. The correlational survey is a research model that examines the relationships between two or more variables and the existence of inter-relational variables (Büyüköztürk, 2012). This study aimed to determine the relationship between the professional self-efficacy perceptions of primary teachers and their collective efficacy perceptions by using the correlational survey model.

Population and Sample

The population of the research comprises primary teachers working in Batman province of Turkey in the spring term of the 2021-2022 academic year. 314 primary teachers were selected by random sampling method to represent the population of the research sample. The distribution of descriptive qualities of the primary teachers' sample was presented in Table 1.

Table 1. Descriptive Qualities of the Research Sample

Variables	Groups	Number of the Teachers	Percentages (%)
Gender	• Male	183	58.3
	• Female	131	41.7
Professional Experience	• 1-5 years	138	43.8
	• 6-10 years	89	28.5
	• 11-15 years	49	15.7

	• 16 years and over	38	12.0
Education Level	• Undergraduate	285	90.8
	• Graduate	29	9.2
Region of School	• District	86	27.3
	• City Center	228	72.7
Union Membership	• Member	164	52.4
	• Not Member	124	39.6
	• Not Mentioned	26	8.0
	Total	**314**	**100**

The table above shows that 58.3% of the sample group comprises male teachers and 41.7% of them are female teachers. In addition, according to the professional experience variable, 43.8% of the teachers have 1-5 years, 28.5% have 6-10 years, 15.7% have 11-15 years and 12% have 16 years or more job experiences. The distribution of primary teachers in terms of education level shows that 90.8% of teachers have undergraduate degree and 9.2% of them have graduate degree. According to the variable of the school region, 27.3% of the teachers in the sample group work in rural areas and 72.7% in the city center. Considering the distribution group of the sample for union membership, which is the last variable, it is seen that 52.4% of the teachers are union members and 39.6% are not members of any union. In addition, 8% of the teachers in the sample group do not express their status about union membership.

Instruments

A data collection tool comprising two parts was used to collect data in the study. In the first part of the data collection tool used, there is a directive showing how the data collection tool will be filled and questions to determine the personal information regarding the primary teachers. The second part of the data collection tool includes the "Teacher Self-Efficacy Scale" and "Collective Efficacy Scale". The Teacher Self-Efficacy Scale was developed by Tschannen-Moran and Hoy (2001), and adapted into Turkish language by Çapa, Çakıroğlu and Sarıkaya (2005), comprising 24 items factored under three dimensions. These dimensions are *Self-Efficacy for Student Engagement*, *Self-efficacy for Using Instructional Strategies*, and *Self-Efficacy for Classroom Management*. Each dimension consists of 8 items. The reliability coefficients obtained during the adaptation process of the scale and the implementation process of this research were presented in Table 2.

Table 2. The Reliability Coefficients of the Teacher Self-Efficacy Scale

	Dimensions	Croanbach alpha (α) (Çapa, Çakıroğlu & Sarıkaya, 2005)	Croanbach alpha (α)
Teacher Self-Efficacy Scale	Self-Efficacy for Student Engagement	.82	.84
	Self-efficacy for Using Instructional Strategies	.86	.88
	Self-Efficacy for Classroom Management	.84	.66
	Total	.93	.90

Teacher Self-Efficacy Scale was a nine-point Likert type, graded from 1 (Strongly Disagree) to 6 (Completely Agree). The other scale in the second part of the data collection tool called The Collective Efficacy Scale, was developed by Goddard, Hoy, and Woolfolk-Hoy (2000) and adapted to the Turkish language by Kurt (2009). The Collective Efficacy Scale is a six-point Likert type and is graded from 1 (Unsatisfactory) to 9 (Very Sufficient). During the adaptation study of the scale, the number of items was reduced from 21 to 16. However, the Cronbach's Alpha reliability coefficient (α) was found as .80 in the adaptation study, while it was (α) .75 in this study. In the literature, the range of $.60 \leq \alpha \leq .80$ reliability is considered being reliable, while

the range of. 80 ≤α ≤1.00, it is considered being highly reliable (Özdamar, 2004). Considering these values, The Collective Efficacy Scale is quite reliable, and the teacher self-efficacy scale has high reliability both in three dimensions and in total.

The Data Analysis

In the data analysis process first, descriptive statistics (frequency, percentage, mean, standard deviation values) were calculated to determine the distribution of the data. In comparing the data according to the determined variables, the distribution of the data was examined to determine the tests selection for analysis. In addition, Levene (Levene(professional self-efficacy)=.06; Levene(collective efficacy)=.013) values were checked to test the homogeneity of the data. In this study, the graphs for the normality were examined since the sample group was over 200. The skewness and kurtosis of the data are not related to the measurement tool, but to the measured feature in social studies, so it seems more appropriate to look at the graphs of normality in studies with over 200 samples (Pallant, 2011: 133). The results of graphics are shown in Figure 1.

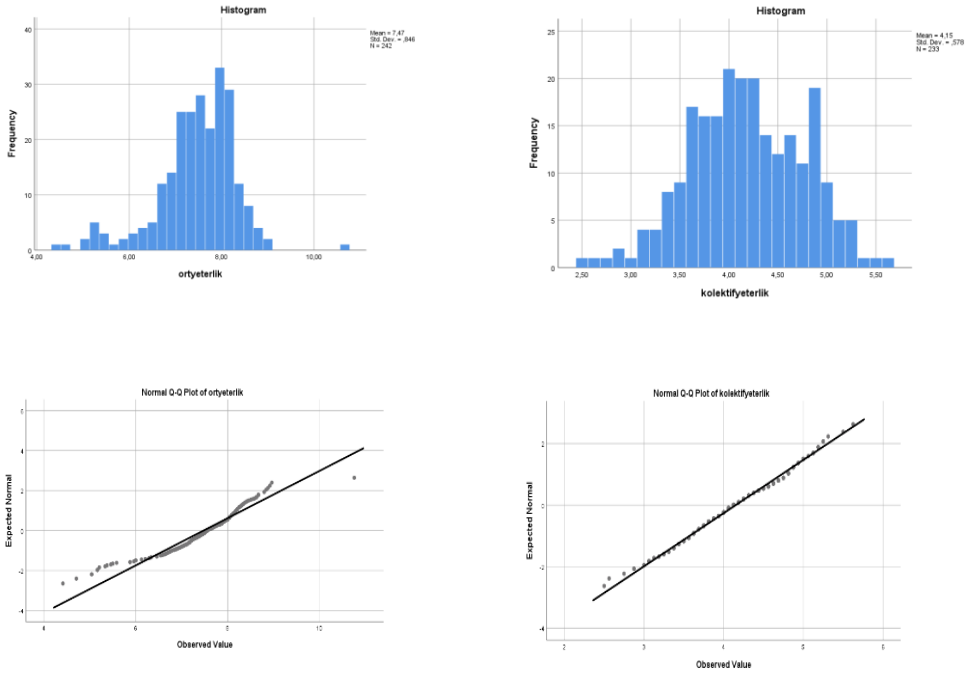

Figure 1. Graphics for Data Distribution

Considering the graphs, the data were normally distributed. Thus, parametric tests were used in the analysis process of the data. Considering this, independent t-test and one-way analysis of variance were used in the analysis of the data, and the Pearson Moment Correlation coefficient was used to determine the relationship between teachers' self-efficacy and collective efficacy perceptions. In addition, Mann Whitney U test, one of the nonparametric tests, was used as the number of groups was less than 30 in the educational level variable. Büyüköztürk, Çokluk & Köklü (2020) define the correlation coefficient value ranges low for 0-.29; medium for .30- .70 and high for .71-1.00. In the groups where significant differences were observed as a result of the comparison of the variables, the Scheffe test was performed as this test is more flexible and enable to keep the margin and types of error under control if the number of groups to be compared is large (Scheffe, 1953).

As for the union membership variable, which is considered as a variable in this study, as some teachers (8.0%) did not indicate whether they have a membership, they were excluded in the analysis process since they could be in both groups or either and have an affect the results of the analysis.

Findings

This section includes the relationship between professional self-efficacy and collective efficacy perceptions of primary school teachers and the findings obtained as a result of comparing the self-efficacy and perceptions in terms of various variables.

Findings Regarding the Gender Variable

An independent t-test was used to compare the professional self-efficacy and collective efficacy perceptions of primary school teachers in terms of the gender variable. The results obtained are given in the table below.

Table 3. Data regarding the gender variable

Dimensions		n	$\bar{x}$	sd	t	p
Self-efficacy for student participation	Male	183	7.37	.91	.21	.84
	Female	131	7.39	.71		
Self-efficacy for instructional strategies	Male	183	7.62	.94	.37	.71
	Female	131	7.66	.82		
Self-efficacy for classroom management	Male	183	7.47	1.03	.13	.90
	Female	131	7.45	1.24		
Collective efficacy	Male	183	4.13	.59	.58	.57
	Female	131	4.17	.57		

*p<.05

The result of the comparison of the professional self-efficacy levels of the primary school teachers and their collective efficacy perceptions in terms of the gender variable showed that the mean scores of female and male teachers' perceptions are close to each other and gender variable did not show significant difference (p>.05).

Findings Regarding the Region of School Variable

An independent t-test was used to compare the professional self-efficacy and collective efficacy perceptions of classroom teachers in terms of the region of the school where teachers work. The results obtained are given in the table below.

Table 4. Data regarding the region of school variable

Dimensions		n	$\bar{x}$	Sd	t	p
Self-efficacy for student participation	District	86	6.96	.91	4.93	.00*
	City Center	228	7.52	.74		
Self-efficacy for instructional strategies	District	86	7.12	1.03	5.94	.00*
	City Center	228	7.84	.75		
Self-efficacy for classroom management	District	86	7.28	1.65	1.52	.13
	City Center	228	7.52	.81		
Collective efficacy	District	86	4.16	.69	.19	.85
	City Center	228	4.15	.54		

*p<.05

The result of analysis showed that mean scores of primary teachers' perceptions are in favor of the teachers working in the schools located city center in all three dimensions of the professional self-efficacy scales. The results of the comparison between groups showed that a significant difference exists in the dimensions of self-efficacy for student participation (t=4.93; p=.00) and self-efficacy for student strategies (t=5.94; p=.00). The results of the comparison of the collective efficacy perceptions of the primary teachers in terms of the variable of the school region where teachers work showed no significant difference (t=.19; p=.85) and the obtained mean scores of teachers' perceptions are close to each other.

Findings Regarding the Professional Experience Variable

One-way analysis of variance (ANOVA) was used to compare the professional self-efficacy and collective efficacy perceptions of Primary teachers in terms of the teachers' professional experience variable. The findings are given in Figure 2 and Figure 3.

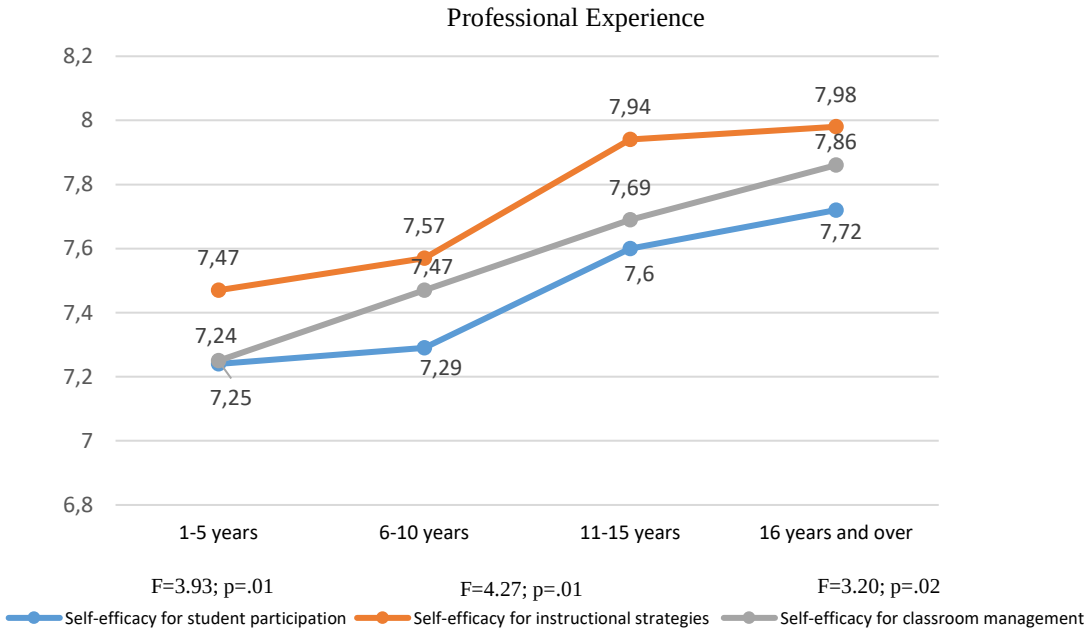

Figure 2. Data regarding to the professional experience variable-1

The distribution of the dimensions of professional self-efficacy levels of primary teachers regarding professional experience is given in the figure above. Mean scores of professional self-efficacy dimensions in the figure showed that as Primary teachers' professional experience increases, their professional self-efficacy increases as well. When the results of the means scores are compared, a significant difference is obtained in all three dimensions (p>.05).

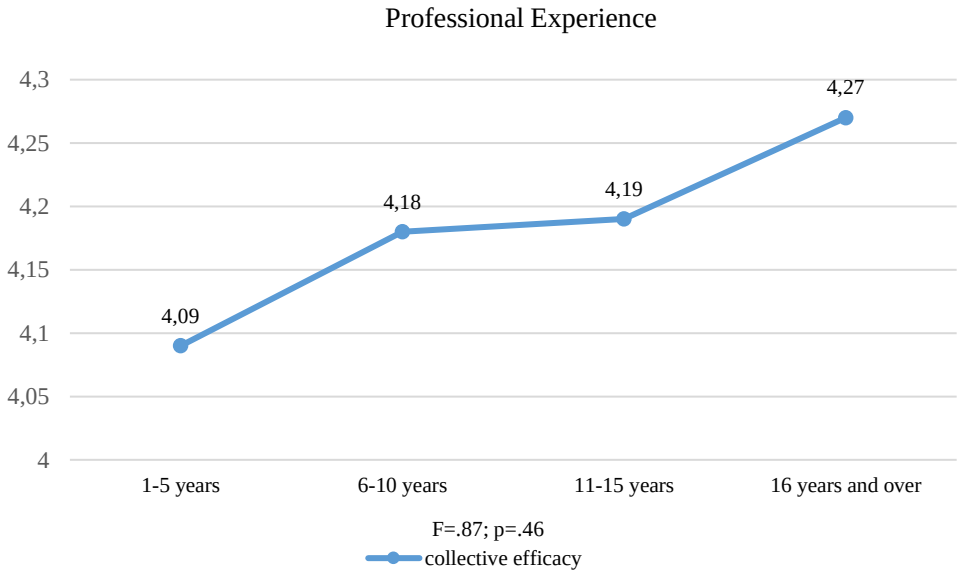

Figure 3. Data regarding to the professional experience variable-2

The distribution of the mean scores of the primary teachers' collective efficacy levels depending on the professional experience is given in the figure above. Considering the collective efficacy mean scores in the figure, as the professional experience of the Primary teachers increases, the collective efficacy means scores also increase. Despite this, one-way analysis of variance showed no significant difference as a result of the comparison of the means scores of teachers regarding to the professional experience variable (F=.87; p=.46).

Findings Regarding Teachers' Education Level Variable

The Mann Whitney U test was used to compare the professional self-efficacy and collective efficacy perceptions of primary teachers regarding the variable of educational status. The results obtained are given in the table below.

Table 5. Data regarding teachers' education level variable

Dimensions	Education Level	N	Mean Rank	Sum of Ranks	U	Z	p
Self-efficacy for student participation	Undergraduate	285	119.86	25889.00	2453.0	.10	.92
	Graduate	29	121.35	2791.00			
	Total	314					
Self-efficacy for instructional strategies	Undergraduate	285	120,11	25824.50	2340.50	.42	.67
	Graduate	29	113.76	2616.50			
	Total	314					
Self-efficacy for classroom management	Undergraduate	285	115.80	25128.50	1475.50	3.23	.00*
	Graduate	29	164.85	3791.50			
	Total	314					
Collective efficacy	Undergraduate	285	117.12	24594.50	2390.50	.08	.94
	Graduate	29	115.93	2666.50			
	Total	314					

*p<.05

The results of the analysis carried out to determine the effect of primary teachers' educational level on their professional self-efficacy showed a significant difference in favor of graduate teachers only in the dimension of self-efficacy for classroom management (U=1475.50; p=.00). The results of the collective efficacy perceptions of the primary teachers comparisons showed that the mean rank of the teachers is close to each other and a significant difference was not obtained between groups comparisons (U=2390.50; p=.94).

Findings Regarding Union Membership Variable

An independent t-test was used to compare the professional self-efficacy and collective efficacy perceptions of primary teachers in terms of the union membership variable. The results obtained are given in the table below.

Table 6. Data Regarding Union Membership Variable

Dimensions	Union Membership	N	$\bar{x}$	Sd	t	p
Self-efficacy for student participation	Member	164	7.45	.77	1.55	.12
	Not Member	124	7.28	.92		
Self-efficacy for instructional strategies	Member	164	7.81	.72	3.23	.00*
	Not Member	124	7.42	1.06		
Self-efficacy for classroom management	Member	164	7.50	.83	.52	.60
	Not Member	124	7.42	1.44		
Collective efficacy	Member	164	4.19	.53	1.18	.24
	Not Member	124	4.10	.63		

*p<.05

When we look at the data obtained as a result of the comparison of the primary teachers' union membership status, it is seen that the self-efficacy perception mean scores of the teachers who are members of any union are higher than the mean scores of those teachers who are not members of any union. Despite this, a significant difference exists only in the dimension of professional self-efficacy for teaching strategies (t=3.23; p=.00).

The Correlation Between Professional Self-Efficacy and Collective Efficacy Perceptions of Tecahers

Pearson Product-Moment Correlation analysis was conducted to determine the level of correlation between primary teachers' professional self-efficacy and collective efficacy perceptions. The data obtained are given in the table below.

Table 7. The correlation between professional self-efficacy and collective efficacy

Variables		1		2		3		4	
		r	p	r	p	r	p	r	p
1.	Self-efficacy for student participation	1							
2.	Self-efficacy for instructional strategies	.78	.00**	1					
3.	Self-efficacy for classroom management	.68	.00**	.62	.00**	1			
4.	Collective efficacy	.19	.00**	.14	.03*	.21	.00**	1	

**p<.01; *p<.05; n=314

The table above showed a high level of correlation between teachers' self-efficacy for student participation and their self-efficacy for teaching strategies (r=.78). In addition, it showed a moderate relationship between teacher classroom management self-efficacy and student participation (r=.68) and teaching strategies (r=.62). It also presented a low correlation between all three dimensions of teachers' professional self-efficacy and their collective efficacy (r<.30).

Discussion and Results

This section covers the results that emerged from the findings obtained as a result of data analysis and discussions of the results in the light of related literature.

In this study, first, mean scores of the primary school teachers' professional self-efficacy and collective efficacy perceptions did not show a significant difference in terms of the gender variable. Studies in the related literature based on examining the effect of gender variable on perceptions of professional self-efficacy (Aydın, 2020; Aydemir, 2019; Aytaç, 2018; Aslan & Kalkan, 2018; Kaçar, 2016; Karabacak, 2014; Gençtürk & Memiş, 2010; Baykara, 2011; Güven, 2005; Bird, 2005), and those of the collective efficacy perceptions (Kapat, 2022; Danış, 2020; Goddard & Skrla, 2006) support this result. Based on this result, it can be said that the gender of the teacher in fulfilling the teaching profession does not influence or slightly decrease the teachers' perceptions of professional self-efficacy and collective efficacy. This effect can be because of the change in gender roles in society. Because the roles of men and women can differ in every society, and it is known that the form of visibility, way of gaining a place in the society, and the rate of active participation in the society may change in terms of gender (Demirkol, 2022). As a matter of fact, the gender inequality existing in school and professional life is decreasing, women are taking more active roles in social life, and the gap between men and women in professional life is vanishing (Denizoğlu, 2008). However, some studies on teacher professional self-efficacy (Çapri & Çelikkaleli, 2008; Ekici, 2006; Akbulut, 2006) and on collective efficacy (Kurt, 2009; Zafer Güneş, 2014) resulted a significant difference in terms of gender roles. Bandura (2002) attributed the different results that may emerge with gender variable to the differentiation of cultural structures. That Turkey has cultural diversity may point out different results regarding the gender variable in studies where gender roles, therefore, the perceptions, beliefs and attitudes of the individuals have been searched.

Based on the findings of this research, it can be said that as the experience of teachers increases, their professional self-efficacy and collective efficacy increase. However, it is concluded that the experiences of the teachers only make a significant difference in professional self-efficacy and but not on their collective efficacy. Studies in the related literature revealing that professional experience makes a significant difference in teacher professional self-efficacy (Gül & Erdener, 2021; Aslan & Kalkan,2018; Karabacak, 2014; Melik, 2014; Daughetry, 2005) and those of studies showing that professional experience does not make a significant difference on collective efficacy (Kapat, 2022; Ünver, 2021; Düzoğlu, 2019; Duman, Göçer & Duran, 2013) supports the result of this study. This result can be associated with the experiences of teachers during their professional life. Because the positive and negative situations encountered in professional life shape the attitudes of teachers in their professional lives (Duman, Göçen & Duran, 2013). Attitudes of teachers through experiences may sometimes make them question themselves and realize their self-efficacy level, while at other times this may lead them to make positive and negative judgments against his colleagues and affect their collective perceptions.

Another variable examined in the study is the effect of the region of the school where the teachers on their professional self-efficacy and collective efficacy. Regarding this variable, it is concluded that teachers' self-efficacy towards student participation and teaching strategies differs significantly in favor of teachers working in the city center. Some studies with similar results also exist in the literature (Korkut & Babaoğlan, 2012; Ercan, 2007). Ercan (2007) associated the significant difference with the experience of teachers working in rural areas, which is consistent with the result obtained in this study that teachers with less professional experience have less self-efficacy than the teachers with more experience. In fact, Primary teachers spend the first years of their professional experience dealing with the problems encountered in rural regions where they began their profession (Asal Özkan, Şahin & Turan, 2022). This may prove that the primary teachers working in rural areas have lower professional self-efficacy than teachers with more professional experience in the city center. Although the professional self-efficacy of teachers working in rural areas is lower for the classroom management compared to teachers working in the city center, a significant difference was not obtained for this result. Similarly, no significant difference was found between the collective efficacy beliefs of teachers working in rural areas and teachers working in city centers. This may be related to the fact that primary teachers working in rural areas work in schools where there are fewer teachers than those of working in the city center. Because primary teachers work alone or with two or three teachers where there are combined classes, not in schools where more than one classroom when compared to other teaching branches. The Ministry of National Education (2021) support this with its statistical data that 739 primary teachers work in 245 schools with 1158 classrooms in the villages in Batman. From this point of view, it may be true to say that the individual characteristics of primary teachers working in rural areas are more prominent in their professional process. Because individual characteristics of teachers have little effect on collective efficacy (Krammer et al., 2018).

Primary teachers' professional self-efficacy levels were examined in terms of the variable of educational status. As a result, it is seen that the mean rank of undergraduate teachers for student participation and teaching strategies is close to the mean rank of graduate teachers however, any significant difference between these groups were not found. When we look at the professional self-efficacy dimension for classroom management, mean rank of the graduate school teachers is higher than the mean rank of the undergraduate teachers and a significant difference was found in favor of the graduate teachers. The related studies in the literature puts forward that educational status does not make a significant difference in teacher professional self-efficacy (Saykal, 2021; Yavuz & Kırbaşlar, 2017; Doğan, 2013; Parlak, 2011; Altunbaş, 2011; Gençtürk, 2008). However, in this study, it is a remarkable result that teachers' professional self-efficacy in classroom management makes a difference in favor of graduate teachers. This situation may be due to the outputs obtained by graduate teachers through the reflection of their academic knowledge and experiences in their

postgraduate education process. This can be associated with the results of the current study conducted by Özdemir (2020), which concluded that the classroom management skills of teachers with postgraduate education are higher and more meaningful than those of with a bachelor's degree. Because the knowledge and skills gained in the learning process reveal positive results in the implementation process, which can increase teachers' professional beliefs and self-efficacy. It is also concluded that the collective efficacy perceptions of primary school teachers do not make a significant difference in terms of educational status variable. This may be because the number of primary teachers with graduate degree is less than teachers with a bachelor's degree, which leads them to have a different point of view.

This study concluded that teachers having union membership influences their professional self-efficacy levels and collective efficacy perceptions. Primary teachers having union membership were determined to have higher both professional self-efficacy and collective efficacy perceptions. Despite this, the significant difference was only observed in favor of the teachers having union membership, especially in the self-efficacy for teaching strategies dimension, significant difference was not observed in the other subdimensions of professional self-efficacy and collective efficacy perceptions. The related literature includes studies revealing that teachers having union membership has a significantly positive effect on teachers' professional self-efficacy perceptions (Mutlu, 2018; Büyükgöze & Kavak, 2017). In addition, the study of Çelik, Gören and Kahraman (2018) resulted that the union membership variable does not make a significant effect on the collective efficacy perceptions of primary teachers, which is in line with the current study's results.

The correlation between teachers' professional self-efficacy and their collective efficacy was positive and low. The studies in the related literature support similar results (Orman & Sevgi, 2022; Krammer et al. 2018; Yılmaz & Turanlı; 2017; Goodard et al., 2000). However, certain studies in the literature also resulted in a moderate level of correlation between teacher professional self-efficacy and collective efficacy (Kaplan & Dinçer, 2021; Gürçay, Yılmaz & Ekici, 2009). The positive correlation emerged in the studies supports that collective efficacy and self-efficacy are related concepts. Already, Bandura (1995) mentioned that social influence has a shaping effect on self-efficacy. However, this effect is not unidirectional. Because individual and organizational factors affect each other bilaterally and if self-efficacy is supported, it contributes to the development of collective efficacy as well (Cansoy & Parlar, 2018).

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Why Doing Philosophy for Children Approach Is a Need for Gifted Children?

Research Article

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ABSTRACT

Arrangements made for education of gifted individuals aim to enable them to use their existing talents at the best level. The philosophy with children approach aims to develop a range of skills, especially high-level thinking skills. This approach, which focuses on children's reflection on a philosophical phenomenon as a group, the aim is to develop children's thinking skills at the end of their questioning processes. In practice, an arrangement for a gifted student may be very different from that for a typical developed student. Differentiation is a shared responsibility of the teacher, each student, and the community of learners in a sensitive classroom environment. It is expected that the education to be provided by making changes is focused on the individual's competence. According to Philosophy for Children approach at the point where thinking education has become so important in the education of both typically developed and gifted children, it is thought that the activity and method of thinking is a task that everyone can do. The aim of this study is to present the necessity and importance of including the philosophy for children approach in their education, based on the characteristics and educational needs of gifted individuals, by discussing in the light of the literature.

Keywords:
gifted children, P4C, philosophy for children, critical thinking, high order thinking skills

Introduction

It is observed that three basic poses significantly determine people's lives at the structure of modern societies. The first is the family as a social structure in which the private values of the individual are institutionalized. The second is the state as a political apparatus in which the public values of the individual are institutionalized. The third one is the school, which both enables the individual to combine private and public values and plays an important role in shaping the future of the individual and the society in which she/he lives. In other words, schools both connects the family and state institutions (that is, combines the

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private and public spheres) and reconstructs the intentions of individuals and their practices within this framework, with the awareness of what kind of social life should be in the future. With this loaded functionality, the school is a key social structure in modern societies. So much so that most of the time, this structure is desired to be constantly designed in accordance with their own goals (or interests) by every political environment or power group that is dominant in the society. Thus, these political groups want to create their own future and the society of the future with new arrangements in accordance with their interests. The natural result of this desire is that social education practices or processes are constantly kept on the agenda and discussed by experts. One of the most important debates on education in recent years has focused on the student-centered education approach. This new paradigm, which aims to organize the educational experiences of students in a way that considers their interests, skills and needs, has become at the center of discussions on education with the spread of life-long learning. When focusing on the purpose of the new paradigm, one of the most important concepts is "critical thinking". Because a tendency that aims to reorganize the student's life by considering his interests, skills and needs cannot achieve this goal by excluding the concept of critical thinking. Critical thinking is essentially philosophical thinking. Without philosophical thinking or perspective, critical thinking processes cannot be understood and theorized. In this context, efforts to develop critical thinking capacities of students (especially young children) require a detailed analysis of the role of philosophical thinking in critical perspective. In this context, it is indispensable for an educator who plans to make critical thinking a fundamental part of education, to consider the role of philosophical thinking in the relevant process. In this context, it is observed that the interest in philosophy for children or philosophy with children has increased both in the world and in our country. Different kinds of philosophical perspectives are at the center of this interest, which is organized within the framework of the aim of developing the critical thinking capacity of children aged between 5-10 years. The title of this research was chosen because it is an important element in the education of gifted children, especially high-level thinking skills. As a result of scientific research since 1970, it has been proven that the Philosophy with Children Approach has significant effects on critical and creative thinking and problem-solving skills. In addition, research has proven that this approach also contributes to reading comprehension skills, math skills, self-esteem and social skills. In line with these proven positive effects, then, “What is Philosophy for Children?” and “Why might there be a need for gifted children?” question comes to mind.

Briefly, Philosophy for Children Approach

This approach, which focuses on children's reflection on a philosophical phenomenon as a group, the aim is to develop children's thinking skills at the end of their questioning processes. With its general definition, philosophy is a discipline that tends to explain concepts and the relationships between these concepts in order to better understand human nature and the world (Brenifier, 2004). The most important factor that gives rise to philosophy is curiosity and the effort to understand, which is the source of this curiosity (Gülenç, 2006). One of the debates that has been going on for years is whether “philosophy” is suitable for children. Since the Platon period, the opinion of philosophers on this subject has been generally negative. This negative thought arises from the constant confusion of the difference between the two concepts: The term 'doing philosophy', that is, to study philosophy as a course, and 'philosophising', to think about any subject with a philosophical method, are not completely independent from each other but are different concepts (Murris, 2000). Matthew Lipman, the founder of the philosophy for children approach, resolved the confusion between these two concepts by explaining the relationship between the concepts: He accepted the term 'philosophising' as the transformation of the term 'doing philosophy' into an activity. For this reason, he showed that it is possible for children to think about a subject with a philosophical method, by the philosophy for children (Lipman, 1988; 1991). Similar to this idea, Karen van der Leeuw stated that many philosophy students learn to think at a good level as well as to learn philosophy at a good level, emphasizing that philosophical thinking can be suitable for all age groups (Van der Leeuw, 1993). Likewise, Cam (1995) suggested that philosophy is a good subject

for children to reconstruct and question their interests and abilities, and that children cannot learn philosophy but can-do philosophy.

This approach, which entered our lives with the term 'philosophy for children (P4C)' in the 1970s, is a method of developing critical thinking in children through philosophical dialogue, proposed by the American philosopher Matthew Lipman. This approach develops collaboratively by enriching a group's perspective. Individual goals and competition are not in the foreground here (Lipman & Sharp, 1980; Lipman, 1995; 2003). The approach is practiced in 50 different countries. Materials providing information about the application and activities of the approach have been translated into 20 different languages (Daniel & Auriac, 2011). These materials aim to develop children's critical thinking skills and increase their ability to communicate with their peers in order to solve a common problem. Lipman's critical thinking approach was heavily influenced by John Dewey's pragmatic philosophy while preparing the parts of this program (Lipman, 1996). Lipman's aim in these programs is to help children become individuals who think more, put forward a judgment, defend, justify and question this judgment (Vansieleghem & Kennedy, 2011). Fisher (2005) describes the skills developed by the philosophy with children approach in children: structuring the concepts, questioning, reasoning, interpretation, making sense, and establishing a relationship between meanings. According to the literature, critical thinking develops through philosophical inquiry is reflective and logical thinking focused on deciding what to do and what to believe (Ennis, 1985). The features that reveal this thinking skill of children are; being curious, analytical, intellectual maturity, open-mindedness, systematic, truth-seeking and self-confidence (Branch, 2000).

Generally, P4C sessions begin with the facilitator presenting a short story, picture, poem, object, or other stimulus. Accordingly, different materials have started to be used in different methods for P4C (Trickey & Topping, 2004). Haynes (2002) summarized the implementation of philosophy for children sessions in 9 steps:

- Performing relaxation exercises and determining session rules,
- Presenting a stimulus (story, object, picture, etc.) to initiate questioning,
- Giving time to reflect on the stimulus,
- Giving time and asking questions for participants to think about interesting or surprising questions,
- Making connections between questions,
- Selecting the question to be questioned in order to enter the inquiry process,
- Encouraging thinking about the question, following each other's thoughts and opening ways of questioning by the facilitator,
- Creating a visual that summarizes and records the discussion and process,
- Summarizing that reflects the process.

Applying these steps is necessary but not sufficient because, as Haynes (2002) points out, philosophical research is not a 'toolkit' approach to developing independent thinking. The process depends more on the quality of interaction and dialogue that occurs, rather than following a step-by-step procedure. That is, the facilitator can take these steps to the letter, but if the quality of the resulting interaction is low, no one will be satisfied with the dialogue.

What We Aim in Education of Gifted Children

What is desired to be done in the education of the gifted is qualified differentiation rather than just differentiation. So, it's not about doing the same thing more than once, it's about doing different kinds of things. In practice, this may mean that an arrangement for a gifted student may be very different from that for

a typical developed student. Who is responsible for developing the differentiated learning process? Tomlinson (2001) stated that differentiation is a shared responsibility of the teacher, each student, and the community of learners in a sensitive classroom environment. He stated that if differentiation is effective, students have the self-awareness and self-defense skills needed to evaluate and implement differentiated learning. Betts (2004)'s third-level curriculum and teaching, learner-differentiated curriculum approach supports this process. In such practices, teachers help students develop their own content, processes, and products through exploration, research, and in-depth study. The role of the teacher in this process is very important and the teacher is responsible for making the instructional adaptation appropriate to the needs of each student. The teacher adapts the content in line with the individual characteristics, learning types, interests and abilities of the students (Riley, 2004). The principles to be used in the education of the gifted should overlap with both enriched and accelerated education options. Enrichment refers to the horizontal expansion of curriculum goals and objectives, while acceleration is vertical movement through them. Ideally, both of these options are used together as opposed to the either/or approach. Therefore, regular classrooms should use both enrichment-based and acceleration-based approaches and involve changes in content, processes, and products (Riley, 2009).

The principles of qualitative differentiation should be evaluated in terms of content, process and product. Contents should be: abstract, shaped around broad themes, question and inquiry-based, integrated with each other, multidisciplinary, deep and broad, organized according to the characteristics and strengths of the student, comprehensive, planned, culturally inclusive, appropriate and relevant, gender-balanced, enriched, diverse, methods organized in a way that includes embedded inquiry skills, moral and ethical values, and the lives of gifted people are explored. Period should be independent and self-directed without losing the group dynamic, in the form of a community where research results can be shared, high-level thinking (analysis, synthesis and evaluation) skills are supported, creative, open to problem-solving procedure, had chance to identify problems, accelerated, basic and high-level skills are presented, discovery or problem-oriented, be designed in such a way that learning strategies are used. Accordingly, the procedure needs to have time management, organization and planning, decision making and developing personal goals, metacognitive skills that allows students to reflect on their own way of thinking and learning, self-understanding (especially in relation to giftedness), and facilitated by installers and teachers. Finally, the products should base on real problems, challenges existing ideas and creates new ones, developed using new and real techniques-materials-ideas, evaluated appropriately and against certain criteria including self-assessment, self-selected, broadly diverse, prepared for an appropriate audience, transform students from the role of consumers to producers of knowledge through the transformation of ideas (Riley, 2004).

What is the Effect of Philosophy for Children Approach on Thinking Skills?

According to Paul (1990), strong critical thinking in Socratic inquiry contributes to developing critical and effective attitudes towards ideas, behaviors and life. In addition, this type of thinking enables children to develop moral qualities such as humility, courage, empathy and honesty. Therefore, for Paul (1993), the right training for the development of critical thinking requires both cognitive (logical and creative thinking) and emotional/moral strategies.

According to Matthew Lipman, individuals need critical thinking to distinguish the most appropriate one for their goals from all the information they have acquired. Therefore, critical thinking is a tool to meet the actions and thoughts to be performed (Lipman, 1988; 1995). The definition of critical thinking proposed by Lipman is pragmatic because for him, critical thinking is a complex process integrated into a utilitarian design for the improvement of personal and societal experience. The development of such a type of thinking is a process established through peer relationships and particularly through philosophical dialogue within a community of inquiry.

Critical thinking is the right guiding and evaluative thinking type to think, believe and do. Critical thinking refers not only to complex skills, but also to a critical spirit. Like philosophy, critical thinking aims at the development of autonomous thinkers who can engage in constructive skepticism, which is the best way to improve the quality of human experience. For this reason, the field of philosophy has also enabled the development of critical thinking for children who have started to develop since the beginning of the 1960s (Daniel & Auriac, 2011). The important thing here is to show children the parallels between philosophy and critical thinking. Based on these views, it is said that philosophy can be defined as a field of study or a way of thinking. As a field of study, philosophy aims at the discovery of truth. Philosophy as a way of thinking aims at the construction of truths through dialogues. In Socratic questioning and pragmatism, philosophy combines practical wisdom, imagination, compassion, and critical thinking as a way of thinking (Daniel & Auriac, 2011). As in philosophical inquiry, logical reasoning, critical dialogue and methodological doubt are recommended for the development of critical thinking skills. On the other hand, the practical and applied aspect of critical thinking emerges as a way of thinking that does not exist in traditional philosophy but exists in philosophy. Since the philosophy for children approach is an applied field of philosophy, it can be said that it directly improves critical thinking skills (Daniel & Auriac, 2011).

Based on this information, there are many studies examining the effect of philosophy with children on critical thinking skills. Lipman (1988; 1995) stated in his studies that critical thinking develops depending on conceptualization, logic, generalization and research skills. At the same time, he argued that critical thinking develops much more easily in relationships with peers rather than being taught in a technical way. In this direction, he stated that the approach to philosophy with children is an approach that meets all these criteria. In Sigurborsdottir's (1998) study with children aged 3-6, the 'philosophy with children' program was applied for 2 years. At the end of the program; It was concluded that children communicate better, understand themselves and their thoughts better, show more respect to other opinions, and increase their critical and creative thinking skills. In another study, Benade (2011) applied 'Philosophy with Children' training to 5th grade students in an action research conducted in New Zealand. After the training, it was concluded that the difference in the critical thinking levels of the students was significant. According to Yıldız Demirtas et al. (2018), a study was conducted to examine the effect of the philosophy with children curriculum prepared for pre-school children on children's inquiry skills, level of question formation and answering skills. According to the results obtained, it was concluded that positive developments were recorded in these three skills that point to critical thinking for the children in the experimental group.

Torrance and Guilford found that creativity is a combination of four main factors: “fluency, creativity, flexibility and elaboration”. When these elements interact with each other, a special dimension called creativity emerges (Lipman, 1995). To be successful in various fields of science and art, creative scientists need to be trained to meet the needs of society and to generate new ideas. In other words, one of the most important tasks of education is to build innovative, creative and dynamic processes for the development of students' abilities (Lipman, 2003). According to Fisher (2007), philosophy for children is an effective approach to develop creative thinking. In addition, individuals who express their experiences can enrich their creative thinking processes by researching in line with their experiences and by adding logical thinking, imagination and self-motivation. For this reason, creative thinking is considered one of the main thinking elements by theorists of philosophy for children.

According to literature, it was seen that there were various studies examining the effect of the philosophy with children approach on creative thinking skills. A study was conducted with students aged 10-13 for 2 years by the Princeton, New Jersey Educational Testing Service in 1978-1980. Philosophy with children approach practices were done twice a week and significant differences were found between the experimental and control groups in students' reading, mathematics, creative thinking and formal reasoning. Ghaedi et al.

(2015) examined the effect of philosophy with children approach on children's creative thinking skills. The program was implemented for 16 weeks. The creative thinking skills of the children participating in the study at the beginning and end of the program were measured with the Torrance Test. According to findings, it was concluded that the philosophy with children approach helps the development of children's creative thinking skills. Similarly, in another study conducted by Haas (1980), it was observed that the students in the experimental group, in which the philosophy with children approach was applied, differed significantly in creative thinking, reading and social relationship skills compared to the control group. Cassidy & Christie (2013) applied the program created in line with this approach to students aged 5-11. P4C method was used in the study he conducted with 6 different groups consisting of 12-33 children from each age level. The study, in which 115 children participated in total, lasted 9 weeks. The video recordings were analyzed and the children were asked to make analogies, use metaphors, make definitions, develop a point of view, change their ideas critically, develop a new idea, etc. At the end of this application, it was stated that the working group made progress in these skills, as it focused on developing the skills specified as part of the operation of this approach. After the philosophy with children sessions applied in the study of Lipman and Bierman (1970), it was seen that the logical reasoning and reading skills of the experimental group differed positively and significantly compared to the control group. In a study conducted by Tooping and Trickey (2007), the 'philosophy with children' teaching program was applied to primary school children for 16 weeks. There was a significant difference in favor of the experimental group between the scores obtained from the "Cognitive Ability Test" administered to the experimental and control groups before and after this training.

Why We Need Philosophy for Children Approach in the Education of the Gifted

General cognitive characteristics of gifted children; have broad interests and imagination, learn quickly and easily, high creativity, large vocabulary, prolonged attention and concentration on topics of interest, good verbal expression, original idea generation, original solutions to problems, problem solving and reasoning ability can be sorted. When the prominent features of gifted children are examined, it is seen that high analytical skills (Davis & Rimm, 2004), abstract thinking (Chuska, 2005; Davis & Rimm, 2004; Hoh, 2008), logical thinking (Davis & Rimm, 2004; Hoh, 2008) thinking creatively and critically (Davis & Rimm, 2004), having bright ideas (Davis & Rimm, 2004), having high-level thinking skills (Davis & Rimm, 2004), having high motivation (Chuska, 2005; Davis & Rimm, 2004), curiosity (Chuska,2005; Davis & Rimm,2004; Hoh, 2008), high problem-solving capacity (Chuska,2005; Davis & Rimm, 2004; Tzuriel et al., 2011, VanTassel-Baska & Stanbaugh, 2006), the ability to transfer knowledge and turn it into practice (Davis & Rimm, 2004; Tzuriel et al., 2011), the ability to think flexibly (Hoh, 2008), strategic thinking (Davis & Rimm, 2004; Cross et al., 2008; Hoh, 2008, Tzuriel et al., 2011) come to the fore. With these characteristics of gifted individuals, asking questions, questioning, reasoning, establishing cause-effect relationships, searching for answers, predicting, causation, etc., which are based on the philosophy approach with children. properties appear to be in harmony.

Due to the rapid changes in science and technology in recent years, the global challenges of the 21st century have revealed the need for changes in education. It is expected that the education to be provided by making changes is focused on the individual's competence. Universities undertake the task of preparing the teachers who will give this training to think in a way that will provide the expected changes. Turning this situation into an opportunity will be possible by starting to use higher-order thinking skills in educational curricula (Conklin, 2011). At this point, increasing the quality of thinking includes skills such as deep, consistent and more productive thinking. What needs to be given to individuals is not only the ability to receive or learn existing information, but also to think critically about a subject. In order to adapt to the developing technology age, it is necessary to gradually reach the complex thinking skills from the lower steps. Brady (2008) defended the same idea by emphasizing the importance of memorization in the development of

comprehensive thinking skills in order to be able to analyze the complex issues presented by life. Despite the social changes between different generations, the findings support the views he advocates. In order to adapt to the constantly changing world, it is necessary to solve the complexity with higher-order thinking skills (Crews, 2010). Based on this information, "The 21st Century Student Profile" has been created and high-level thinking skills have begun to be integrated into all levels of education. At this point, it is important to integrate educational approaches that support high-level thinking skills such as philosophy with children into educational environments and to support this situation with scientific studies.

According to Philosophy for Children approach at the point where thinking education has become so important in the education of both typically developing and gifted children, it is thought that the activity and method of thinking is a task that everyone can do. The aim here is not to present non-philosophical subjects to people who are not related to philosophy or to solve the given problems completely, but to create opportunities for children to solve their own problems through their intellectual skills. Although the approach is not solution-oriented, it envisages some cognitive goals. Since these programs are intended to make children thoughtful, flexible and rational, if the programs are implemented regularly and correctly, not only their educational achievements but also their social lives are positively affected. In addition, children's reflective skills will be prepared to react rationally to life problems and reach a level where they can use intellectual skills at a high level (Trickey & Topping, 2004). UNESCO, which carries out large-scale studies on philosophy for children, has also identified six main purposes of this approach (UNESCO, 2007). These purposes are respectively; to think independently, to be an attentive citizen, to support personal development, to develop language and discussion skills, to conceptualize philosophy, to build a special teaching method for children. As a result, in the philosophy for children approach, children are empowered to react appropriately under new conditions and to shape their behavior based on future goals (Venter & Higgs, 2014). This authority is the source of responsibility. According to Lipman's view, the goals of the philosophy for children approach include teaching creative thinking, critical thinking, ethical values, teaching ethical and artistic values, and personal and interpersonal maturity. Lipman argues that the traditional education-teaching methods used in primary and secondary school periods are determined in a way that does not include critical and creative thinking in children, therefore, children cannot benefit from living skills based on discrimination and reasoning ability in adulthood. According to Lipman, the traditional teaching-learning technique deals with memorizing the contents, memorizing and filling the memory with a large amount. Therefore, it gives children a less valuable and superficial reflective skill. Rather than such an education for the thinker, approaches that will provide children with intellectual skills such as conceptualization, semantic analysis and reasoning should be employed (Lipman, 2003).

Conclusion

The education of gifted students from early childhood, it is a fact revealed in the direction of scientific studies that an education that supports creative and critical thinking, asking questions, questioning, problem solving, realizing existing problems, developing products related to problems, and metacognitive thinking is provided (Gilmanshina et. al, 2021; Papadopoulos, 2020)). In addition to a lot of research revealing the effect of philosophy for children approach on high-level thinking skills and meta-cognitive thinking skills of all individuals (3+ years), many scientific studies have also been revealed that it improves other social and academic skills (Andal, 2020; Talias, 2022; Xin et al., 2020). In line with the scientific information included in this research, it is recommended that the philosophy for children approach be used at all levels of the education of gifted children and in a multidisciplinary manner. In this direction, it is recommended to conduct scientific studies that will reveal the long-term effects of experimental studies with gifted children.

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Virtual Education Ecosystems from Metaverse Perspective

Research Article

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ABSTRACT

This research aims to synthesize studies that discuss metaverse-like 3-dimensional virtual and digital education ecosystems in the context of education. The research conducted by the meta-synthesis method synthesizes 27 research findings selected according to the relevant inclusion and exclusion criteria by reviewing literature using certain keywords. As a result of this synthesis, carried out in the systematic of various stages according to the relevant methodology, it is clear that the new generation internet technologies have changed the relationship between education and technology. With this stage, which digitally transforms the theoretical and practical dimensions of education, virtual and digital ecosystems have become an educational environment. This situation erodes the meaning and position of individuals, knowledge, and society, which are the pillars of formal education. This inevitable situation is a requirement of digital pedagogy, which is the educational paradigm of the 21st century. This is why there has been an increasing interest in this subject in recent years in related studies. As these studies show, although there are some risks, virtual education ecosystems like the metaverse facilitate access to learning and individualize it by freeing education from the constraints of time, place, and instructor. The synthesized studies emphasize that educational ecosystems such as metaverse, which enrich the educational content extraordinarily, support cognitive and affective development, especially in language and science teaching, and provide advantages in terms of group work, motivation, and self-efficacy by bringing together play and learning. Finally, the research shows that metaverse-like virtual and digital ecosystems have the potential to provide significant expansions in terms of adaptation of the Turkish Education System to the Information Age.

Keywords:
Metaverse, virtual ecosystems, digital education, digital pedagogy

Introduction

Looking at the background of the relationship between education and technology, which is contemporaneous with the history of humanity, it is possible to say that this relationship has mostly occurred in the form of technology being transformed by education. Although there are some other factors, especially formal education has always evolved through technology and reached its present day. Technology, which is

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the driving force of this evolution, has historically served as a tool or factor that supports education until the new generation internet technologies in the 21st century. With the aforementioned technologies influencing almost every stage of life on a global scale and initiating digital transformation (Oliveira & Souza, 2022), the relationship between education and technology has reached a new stage. At this irreversible stage, the relationship between education and technology seems to have changed forever. This change can be summarized as an attempt to replace the metaverse-like virtual and digital applications based on new-generation internet technologies by surpassing the role of being a stakeholder in education. The concept of metaverse (Narin, 2021; Lee, 2021), whose theoretical background is based on a science fiction novel (1992, Neal Stephenson) about 30 years ago, is a virtual-digital technological combination that has developed in the form of the evolution of digital games and has reached the present day with the stages of Blockchain, web.2.0, web.3.0, and web.4.0. Etymologically, the metaverse, which consists of the words 'meta' (abstract, virtual) and 'verse' (universe), can be expressed as an "abstract or virtual universe" (Lee, 2021; Choi & Kim, 2017) created by technology. With software and hardware based on new-generation internet technologies, this virtual and simulative environment that transcends time and space is undoubtedly a candidate to become a new stakeholder in every field, including education.

The metaverse (Kim, 2021), which is at the intersection of the real world and virtual space, is a 3D virtual universe that hosts many technologies such as augmented and mixed reality, mirror worlds, life diary, simulation, virtual objects, software and wearable technologies (Pucihar & Kljun, 2018; Happy, 2018; Warburton, 2009). On the other hand, the metaverse is also defined as the virtual universe (Schroeder et al. 2001) where the physical world features are modeled in a networked digital space where the user is represented as an avatar. This universe has evolved in a very short time and has become a blockchain-based virtual ecosystem (Narin, 2021) that gives individual mental sensations as well as physical sensations. This abstract universe (Choi & Kim, 2017) that the individual enters through an avatar (virtual representation) is an interactive virtual reality that gives many sensory feelings (Erkılıç & Dönmez, 2020). The individual can interact with objects and other participants without contact by being included in this virtual environment through the avatar (virtual screen personality) (Park & Kim, 2022). With these qualities, the metaverse can be considered as an educational ecosystem (Yoo & Keung, 2021; Avcı, 2017) that offers the individual an interactive rich environment, virtual experience, and self-learning opportunities, and is suitable for the constructivist education approach.

Metaverse-like 3-dimensional digital and virtual ecosystems, which free education from the constraints of time, space, and instructor, and enable individual learning, can be seen as a very attractive learning environment (Gennett, 2010), especially for new generations, with game-based simulations (Akpınar & Akyıldız, 2022; Şimşek, Erbay & Kirişçi, 2019). With its 24/7 pace, the metaverse also offers important opportunities for the individualization of education (Duan et. al, 2021). Metaverse, which represents the next-generation virtual and digital technological combination (Kiraz, 2014), can be seen as a virtual education ecosystem with these features. Therefore, it is not easy for the current school-based, time and space-restricted, administrator and teacher-controlled education system to resist the metaverse ecosystem that combines game-entertainment-technology. The signs of this are visible.

It is a fact that metaverse-like virtual applications, the features of which are briefly touched on above, affect education globally (Mello et.al., 2020). Digital transformation in education has accelerated with the impact of these new generation-internet-based virtual and digital 3D ecosystems on education (McCarthy, 2020). What is remarkable here is that metaverse-like virtual-digital applications significantly change the relationship between education and technology. This change is an attempt to become an educational environment by surpassing the role of technology as a tool that supports education (Akpınar & Halitoğlu, 2022). With the continuation of this trend, it can be expected that total education will become technology-

driven. This transformation is not only limited to the practical dimension of education but also affects the theoretical ground of formal education. With this effect, it seems that there will be serious erosions in the theoretical and practical dimensions of formal education. These erosions can lead to serious changes in the meaning and scope of "individual", "knowledge" and "society", which are the theoretical foundations of formal education because in this timeless, spaceless, and distanceless virtual environment (Alanka & Cezik, 2017; Göker, 2017), the student transforms into a disembodied subject (Erkılıç & Dönmez, 2020), information becomes a digital form, and the teacher turns into a technology manager (Bakioğlu & Şentuna, 2001). Moreover, society is beginning to change as the Industry 5.0 Smart Society as a contactless society (Göker, 2017). Student-information-teacher interaction, which forms the theoretical basis of education, turns into avatar-digital information-moderator teacher interaction (Akpınar & Akyıldız, 2022). These changes related to the individual, knowledge, and society, which are the pillars of education, will inevitably make digital pedagogy (Facerand & Selwyn, 2021) and in this context, virtual education ecosystems a subject of discussion. Interest in this subject has increased in recent years, triggered by the Covid-19 pandemic that we have experienced recently and the intense interest in change and innovation in education. This interest results in many studies related to digital transformation in education, virtual education ecosystems, and the metaverse. However, the results of these studies, each conducted with a different context, perspective, and methodology, are not sufficient to understand the subject from all dimensions. However, it is critical to understand this from all dimensions for the adaptation of the Turkish Education System to our age. In this respect, this research, which synthesizes studies that discuss metaverse-like 3-dimensional virtual and digital education ecosystems in the context of education, is expected to contribute to the current discussions.

Method

Model and Scope of Research

This study, whose main purpose is to synthesize the studies that deal with metaverse-like 3-dimensional virtual and digital education ecosystems in the context of education, is a meta-synthesis study. Meta-synthesis studies are studies that include reading, interpreting, and qualitative evaluation of the findings of studies conducted in a specific field in line with the research purpose (Polat & Ay, 2016). On the other hand, meta-synthesis studies are studies that systematically compare the results of studies in a specific field and include interpretations and qualitative evaluation based on combining the results (Herdem & Ünal, 2018). Based on the literature (Bondas & Hall, 2007), in meta-synthesis studies, it is recommended to work on an average of 10-12 studies or research to avoid clutter and for deep analysis (Polat and Ay, 2016). Meta-synthesis, which aims to reveal the similar and different aspects of the studies discussed, aims not only to systematically review the literature but also to integrate the findings (Taş & Aykaç, 2019). Meta-synthesis, which is among the interpretive research approaches, is based on the comparison of similar and different dimensions of the knowledge revealed by qualitative studies on a certain phenomenon or event (Herdem & Ünal, 2018).

Following the meta-synthesis method, the systematic steps followed under the relevant methodology in this research, whose general purpose is to synthesize studies that deal with metaverse-like 3-dimensional virtual and digital education ecosystems in the context of education, are as follows:

Step 1: Determining the boundaries of the subject, the questions, and the scope of the research.

Step 2: Reading the studies included in the research and creating common themes.

Step 3: Synthesizing common themes.

Step 4: Reporting the findings.

First, following the subject of the study, the keywords "metaverse", "virtual education", "digital education", and "3-dimensional environments" were searched through the following addresses: Google

Academy, TÜBİTAK ULAKBİM, Dergi Park, Higher Education Council thesis center and Web of Science. As a result of these searches, a total of 47 studies containing these keywords and dealing with virtual-digital environments in the context of education are reached. These studies are evaluated according to the following criteria: a) Metaverse /virtual/ digital-based virtual environments should be related to education. b) The keywords determined in the study must be in the article or thesis titles and/or their keywords. c) The methods and data collection approaches used in the studies should be clearly stated. d. Studies should be available in full text. 27 of the studies evaluated according to these criteria are included in the research to be synthesized. Then these studies are coded according to keywords and themes are created. The template for these encodings is presented in Table 1.

Table 1. Meta-Synthesis Code and Theme Template

Theme	Theme Code
Metaverse as Education Ecosystem	EEOM
Virtual Reality Awareness in Education	ESGF
Digital Transformation Awareness in Education	EDDF
Contribution of Virtual-Digital Ecosystems to Education	SDEEK

The studies included in the research that produced the themes in the template seen in Table 1 are given in Table 2.

Table 2. Studies Included in the Research

Code	Author	Year	Study Type	Model, Sample, and Data Collection Tool	Theme
A1	Kuloğlu, A., Akpınar, B. & Erdamar, F.S.	2022	Research Paper	Quantitative research, Pre-service teachers, Survey.	EEOM
A2	Yıldız, Ö. & Kaya, B.	2022	Research Paper	Survey research, High school students, Questionnaire	EDDF
A3	Okul, T.	2022	Ph.D. thesis	Mixed method, University students, Achievement test, and observation form	SDEEK
A4	Yorgancı, O. K.	2021	Ph.D. thesis	Quantitative research, University students, Achievement tests, and scale	SDEEK
A5	Özdoğan, M.	2021	Master's thesis	Mixed method, University students, Questionnaire, and interview form	ESGF
A6	Özdeniz, Y.	2021	Master's thesis	Mixed method, Secondary school students, Achievement test, and unstructured interview form	SDEEK
A7	Tüzün, H., Alsancak, D. & Altıntaş, A.	2021	Research Paper	Qualitative research, University students, Observation, and interview	EEOM
A8	Buluk, B. & Eşitti, B.	2020	Research Paper	Quantitative research, University students, Survey	SDEEK
A9	Altunkaynak, D., Elgül, D.Ö., Dzhanmamedov, A & Çetinkaya, K.	2020	Research Paper	Experimental model, Secondary school students, Achievement test	ESGF
A10	Topaloğlu, M.	2020	Research Paper	Quantitative research, University students, Scale	EDDF
A11	Sezgin, S. & Fırat, M.	2020	Research Paper	Qualitative research, Literature review, Content analysis	ESGF
A12	Elvan, D. & Mutlubaş, H.	2020	Research Paper	Quantitative research, University students, Survey	SDEEK
A13	Pamukçu, B. S. & Çakır, H.	2020	Research Paper	Quantitative research, University students, Survey	EEOM

A14	Karabacak, Z. İ. & Sezgin, A.A.	2019	Research Paper	Qualitative research, Literature review, Observation, and interview	EDDF
A15	Doğan, D.	2019	Ph.D. thesis	Qualitative research, University students, Project report	SDEEK
A16	Soylu, M. S.	2019	Master's thesis	Mixed method, Pre-service teachers, Interview form, and content analysis	ESGF
A17	Yaşlıca, E.	2019	Ph.D. thesis	Mixed method, University students, Achievement test, and interview form	SDEEK
A18	Topuz, Y.	2018	Master's thesis	Quantitative research, University students, Achievement test	SDEEK
A19	Avcı, K.Ş.	2018	PhD thesis	Mixed method, Secondary school students, Achievement test and meta-synthesis	SDEEK
A20	Akçay Bekiroğlu, H. & Hülür, A. B.	2016	Research Paper	Quantitative research, University students, Survey	SDEEK
A21	Kılınç, M.	2015	Ph.D. thesis	Quantitative research, University students, Achievement tests, and information form	SDEEK
A22	Göçen, G.	2014	Master's thesis	Quantitative research, University students, Achievement test	SDEEK
A23	Yıldırım, D.	2013	Master's thesis	Mixed method, University students, Questionnaire, Scale, and Personal Report	SDEEK
A24	İliç, U.	2013	Master's thesis	Mixed method, University students, Questionnaire, Interview	EEOM
A25	Kayapa, N.	2010	Ph.D. thesis	Mixed method, University students, Scale, Interview form	SDEEK
A26	Başaran, F.	2010	Master's thesis	Quantitative research, Pre-service teachers, Scale	SDEEK
A27	Acaroğlu, K.	2010	Master's thesis	Qualitative research, University students, Product Evaluation	SDEEK

Looking at Table 2, it is clear that 11 (40.74%) of the studies included in the research are research papers, 9 (33.33%) are master's theses and 7 (25.93%) are Ph.D. theses.

The distribution of the studies included in the research in Table 2 by years is in Table 3.

Table 3. Distribution of Studies Included in the Research by Years

Year	Frequency	%
2022	3	11.11
2021	4	14.81
2020	6	22.22
2019	4	14.81
2018	2	7.41
2016	1	3.7
2015	1	3.7
2014	1	3.7
2013	2	7.41
2010	3	11.11

Looking at Table 3, the studies included in the research were mostly carried out in 2020, 20221, and 2019.

The fact that studies on the relationship between education and 3-dimensional virtual and digital ecosystems such as Metaverse were mostly conducted in 2020 can be considered as the subject is still up-to-date.

Analysis of Data

Within the research, the data, whose necessary information is given in the tables above, is processed following the relevant methodology (Herdem & Ünal, 2018) in the following stages: Step 1: The study subject of the research is metaverse-like virtual education ecologies and digital education program. Step 2: To examine the subject, the literature is reviewed using certain keywords, and a total of 27 studies are selected for analysis. Step 3: The studies included in the research are reviewed and key concepts related to the themes are determined for analysis and synthesis. Step 4: Similar and different aspects of the selected studies are revealed. Step 5: The converted data is synthesized. Step 6: These conversions are synthesized. Finally, in Step 7, the data is synthesized and discussed. After these stages, the validity of the research is ensured in accordance with the relevant methodology (Herdem & Ünal, 2018). For this purpose, descriptive validity is provided by justifying the accuracy of the data obtained from the studies reviewed, and interpretative validity is provided by analyzing the data according to the purpose and sub-objectives mentioned in the research. Finally, the method used in the analysis and interpretation to ensure the theoretical validity is followed.

Findings

Model and Method of Synthesized Studies

The distribution of the models and methods in which a total of 29 studies are included in the study according to the inclusion and exclusion criteria mentioned above is given in Table 4.

Table 4. Distribution of Studies Included in the Research by Years

Research Model	Frequency	%
Quantitative	15	55.55
Qualitative	5	18.52
Mixed Method	7	25.93

Looking at Table 4, it is clear that out of 27 studies synthesized in the research, 15 (%55.55) are quantitative, 5 (%18.52) are qualitative, and 7 (%25.93) are mixed method studies. However, examining these research models closely, it is evident that different analysis techniques are used under the same model or method. It is useful to have a look at Table 5 to better understand this detail.

Table 5. Data Collection Tools of the Studies Included in the Research

Research Model	Data Collection Tools	Frequency	Percentage
Quantitative	Scale	4	14.81
	Questionnaire	7	25.92
	Achievement test	4	14.81
Qualitative	Interview form	3	11.11
	Observation	2	7.4
Mixed Method	Achievement test	2	7.4
	Interview form	3	11.1
	Observation	1	3.7
	Focus group interview	1	3.7

Looking at Table 5, it is clear that data are collected mostly via questionnaires in quantitative studies, interview forms in qualitative studies, and achievement tests and interview forms in mixed-method studies.

The sample distribution of the studies synthesized in the study is given in Table 6.

Table 6. Sample Distribution of Studies Included in the Research

Sample Group	Frequency	Percentage
University Students	20	74.07
Pre Service Teachers	2	7.4
High School Students	2	7.4
Secondary School Students	3	11.11

Looking at Table 6, it is clear that the synthesized studies were mostly conducted with university students (%74.07). University students are followed by secondary school students (%11.11), pre-service teachers (%7,4), and high school students (%7.4), respectively.

The studies that have been statistically analyzed so far are reviewed systematically under the methodology of the stages of the meta-synthesis method, and expressions and concepts about similar and different aspects are reached. Data on this are in Table 7.

Table 7. Key Phrases and Concepts Related to Themes in the Studies Included in the Research

Themes	Key Phrases and Concepts	F	%
Metaverse as Education Ecosystem (EEOM)	Metaverse is the technological environment that supports education	1	3.7
	Three-dimensional environments increase the sense of "presence"	1	3.7
	Metaverse-like virtual environments affect the perception of space	2	7.4
Virtual Reality Awareness in Education (ESGF)	Virtual reality is mostly perceived as gaming and communication	1	3.7
	Virtual applications improve the perception of space	1	3.7
	Virtual environments are related to the mental health of the individual.	2	7.4
Digital Transformation Awareness in Education (EDDF)	Digital transformation in education affects students' mental well-being	1	3.7
	Digital education leads to differences in access to education	1	3.7
	Adaptation to digital transformation is about digital literacy	1	3.7
Contribution of Virtual-Digital Ecosystems to Education (SDEEK)	Three-dimensional virtual applications with digital storytelling support language learning	3	11.11
	Virtual reality applications positively support success and attitude in education.	4	14.82
	Digital applications support self-efficacy in language learning	1	3.7
	Virtual-digital and "e" applications in education contribute to science teaching.	6	22.22
	Virtual applications provide individualization in education	1	3.7
	Virtual applications support collaborative learning	2	7.4

Looking at Table 7, which shows the synthesis of the studies included in the research, within determined themes, the following findings are reached:

First, the synthesized studies are mostly quantitative. In these quantitative studies based on the statistical paradigm, data were collected from sample groups, mostly university students, mainly by questionnaire. These findings may be due to the fact that Turkish researchers examining the relationship between metaverse-like 3-dimensional virtual and digital ecosystems and education prefer to work on sample groups that are relatively easy to reach with more known and more widely used methods. The fact that the questionnaire was predominantly used in these studies may be due to the fact that valid and reliable scales related to metaverse-like 3D virtual and digital ecosystems, which is a relatively new phenomenon, are not widespread.

Secondly, it is possible to say that studies on metaverse-like virtual ecologies in Turkey mostly discuss the role of these 3D environments in the education process. The fact that these studies were mostly conducted with university students, pre-service teachers, and high school and secondary school students may be due to

the fact that virtual and digital technology applications such as metaverse are mostly associated with new generations. The literature confirms that new generations exist in these virtual environments. This finding can be interpreted as an actual situation that brings up the relationship between new generations and education because metaverse-like virtual-digital applications are a real phenomenon that has entered our homes and schools over smartphones, personal computers, and the Internet, and despite adults. It may seem natural for researchers to consider this real situation in the context of new generations.

Third, in the synthesized studies, researchers' curiosity about the nature of virtual ecosystems draws attention because many studies discuss students' perceptions and opinions about 3D virtual and digital technology education applications. This is an important point of view for individuality in education because it is evident that the new generations, who are described as Generation Z, are technology-mediated and prefer to communicate and access information through virtual channels. Therefore, the perceptions and views of these people, who live with virtual-digital technology in daily life, about the use of this technology in education can be a guide for the design of instructional activities.

Fourth, researchers need to focus on the relationship between virtual and digital ecosystems and education, in terms of the "spirit of the times," because education must be appropriate to the time and the individuals shaped by it. Considering that digital transformation affects every stage of life in the 21st century we live in, education researchers should not be expected to ignore it. This situation is also important in terms of the adaptation of the Turkish Education System to our age based on the "digital pedagogy" paradigm. Moreover, it is known that the Turkish Education System has taken important steps in keeping up with the digital transformation, especially the FATIH Project.

Fifth, it is noteworthy that the synthesized studies focus on the emotional characteristics of students as well as their mental development in the relationship between virtual-digital ecologies and education. Indeed, many studies show that metaverse-like 3-dimensional virtual and digital ecosystems affect the individual's perception of time, place, and space. Concerning this, the effects of these environments on the mental and affective processes of young people are often accompanied by anxiety. However, the studies synthesized in this research present findings that virtual and digital education applications positively affect the attitudes of individuals toward their lessons as well as their mental processes. This fact can be interpreted as metaverse-like 3-dimensional virtual and digital ecosystems support individuals academically and emotionally when pedagogically and technologically planned and implemented correctly.

Sixth, the synthesized studies show that metaverse-like 3-dimensional virtual and digital ecosystems contribute to science teaching. These findings, which are also supported by the literature, are perhaps the most important advantage of virtual and digital education ecosystems. 3-dimensional virtual and digital ecosystems like metaverse allow the teaching of subjects or phenomena that are difficult to access in real life in terms of danger or cost. Thus, it is possible to say that the synthesized studies also draw attention to the fact that metaverse-like 3-dimensional virtual and digital ecosystems eliminate the limitations of time, space, and teachers in education.

Finally, the synthesized studies show that new generations (students) are more present in metaverse-like 3D virtual and digital ecosystems for gaming and communication purposes. Based on this important finding, it can be expected that this new generation of students, called the technology-mediated Generation Z, will make a similar choice in learning. The findings in the synthesized studies showing that virtual and digital applications give positive results in language education also support this. Understanding this expectation is extremely important in that the Turkish Education System offers appropriate education and training opportunities and educational programs to students.

Discussion, Conclusion And Recommendations

This research, which is a meta-synthesis study on 3-dimensional virtual and digital ecosystems similar to the metaverse, reaches the following conclusions based on the findings of 27 studies.

The relationship between education and technology, which is contemporary with the history of humanity, has reached an irreversible new stage with the metaverse-like 3D virtual and digital ecosystems based on new-generation internet technologies. At this stage, virtual and digital applications such as metaverse and second life become an educational environment by surpassing the role of supporting education (Park & Kim, 2022). These abstract environments include blockchain technology, artificial intelligence, cloud and edge computing and cryptocurrencies, web 3.0, broadband internet, mobile technologies, cloud computing, digital media, big data, artificial intelligence, augmented reality, internet of things, and 3D printers (Kocaman-Karoğlu, Bal-Çetinkaya & Çimşir, 2020). All digital applications that take place in augmented and virtual reality and called augmented reality (Damar, 2021) can be considered virtual ecosystems. The fact that these systems are the subject of education is called by various names such as virtual education ecosystem, virtual and digital education ecology, or digital universe. All these names can be gathered under the umbrella concept of "digital education". These decentralized virtual ecosystems, independent of time and space, lead to radical changes in the meaning, location, and function of the basic elements that make up formal education. That is why, as revealed in this research, there has been intense interest in the relationship between metaverse-like 3D virtual and digital ecosystems and education over the last decade. This interest, which is the leading indicator of new educational paradigms (Pardiñan & Loremia, 2020) such as digital pedagogy, which is the reflection of new generation internet technologies, is important in terms of the adaptation of the Turkish Education System to this trend.

The digital transformations experienced with the metaverse-like 3D virtual and digital ecosystems, which are the subject of research, peaked with the Covid-19 Pandemic process. At this point, some people adopt the wrong belief that "3-dimensional virtual and digital education ecosystems like the metaverse are the imposition of extraordinary situations" (Gencer, Kesbiç & Arık, 2021; Öztürk, 2020; Özer & Suna, 2020; Eken, Tosun & Eken, 2020; Sezgin & Fırat, 2020). However, the studies synthesized in the research show that this belief is not common among education researchers because, as seen in Table 3, there has been a great interest in virtual education in Türkiye in the last ten years.

In Türkiye, there are positive and negative views about associating metaverse-like 3D virtual and digital ecosystems with education. According to the negative view, these virtual environments without time, place, and space dramatically change formal education. This change also changes the mental processes of the individual such as perception, learning, and thinking (Yıldız & Kaya, 2022). However, it is doubtful whether this is positive or negative because many research findings show that this technology increases physical, technological, psychological, and social concerns on this subject (Pamukçu & Çakır, 2020; Tepe, 2019; Koçak, Karakuş & Göktaş, 2018; Avcı, 2017; Topu, 2015). On the other hand, those who have a positive view on the subject think that virtual education ecosystems eliminate formal education, time-space, and teacher-based boundaries and enrich educational environments. Moreover, many studies support these views (Lee, 2021; Hazneci, 2019; Salmon & Edirisingha, 2010; Choi & Kim, 2017). These two opposing views make the use of metaverse-like 3D virtual and digital technologies in education controversial. The studies synthesized to shed light on this debate in the research show that, despite the two research results that mostly virtual and digital ecologies pose risks for the mental health of the individual, the majority of these technologies contribute to the teaching process in an academic and affective sense. However, the following claim can be made based on the fact that these studies are mostly carried out simultaneously with face-to-face education: The education community in Turkey prefers to integrate virtual and digital technologies into existing face-to-face education rather than replace the formal education process. This preference is called "blended education" in the literature.

Based on the fact that related studies are mostly conducted with university students, it can be argued that especially university students in Turkey prefer a blended education in the form of integrating these technologies into face-to-face education rather than purely virtual-digital ecosystems. Indeed, as Japan did, metaverse ecology can be employed as a complement to face-to-face education and e-learning (Barry, et. al., 2009).

Another remarkable result of the research is that metaverse-like 3-dimensional virtual and digital ecosystems contribute positively to science teaching. There are many research findings in the literature (Yoo & Keung, 2021; Şimşek, Erbay, & Kirişçi, 2019). According to these findings, metaverse-like 3D virtual and digital ecosystems make a significant contribution to accessing risky or costly issues in real life. These contributions can be summarized as providing rich perceptual clues, providing versatile feedback and experience, transferring knowledge and having fun while learning (Can & Şimşek, 2016), and learning autonomy. Many physics, chemistry, and biology topics are accessible through virtual and hologram simulation, as in the case of nuclear energy. However, in addition to all these advantages, psychological and emotional risks (Akçay Bekiroğlu & Hülür, 2016) such as virtuality-reality delusions and self-confusion, and academic problems such as the reliability of information and the evaluation of success (Guvendir & Ozkan, 2021) should not be overlooked. Therefore, it is possible to say that we are at the beginning of the road in designing metaverse-like 3D virtual and digital education ecosystems because this design process, which has dimensions such as individual, knowledge, technology, and society, is a very complex subject related to the disciplines of education, philosophy, psychology, sociology, and technology. As a result, metaverse-like 3-dimensional virtual and digital education ecosystems are the necessity of our age, not the imposition of extraordinary situations (Parlak, 2017). Looking at the history of education and technology, it is evident that education has mostly undergone technology-mediated changes. In this age transformed by the new-generation internet technology, the individual, information, and society have been radically transformed. The educational paradigm of this transformation, which transforms the individual into a disembodied subject (avatar), information into digital form (Göker, 2017; Akpınar & Akyıldız, 2022), teacher into a technology manager (Bakioğlu & Şentuna, 2001) and finally society into the information society, has to be technology-based digital pedagogy. However, while constructing this technology-based digital pedagogy, care should be taken to protect the individual from global manipulations, to be mentally and emotionally balanced, and to provide opportunities for self-directed and independent learning (Kocaman-Karoğlu, Bal-Çetinkaya & Çimşir, 2020). Formal education based on virtual and face-to-face collaboration should be done by taking into account the learning Analytics (Tepe Küçükoğlu & Akça, 2021), the theory and philosophy of virtual-digital technologies, psychological studies about the virtual self (avatar), anthropological analysis of the phenomena of" placelessness" and "decentralization" (Göker, 2017), and sociological analyzes of the information society. In the transformation of this into an education program, relevant analyzes, the Covid-19 pandemic process, and global and national experiences should be taken into account as a historical basis.

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Opinions of Science Teachers on Developing Innovative Thinking Skills in Secondary Schools*

Research Article

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ABSTRACT

Developing effective science education programs is essential for producing scientifically literate and qualified individuals. Science courses aim to foster a range of skills, including scientific process skills, life skills, engineering and design skills, and innovative thinking skills. One of these skills, innovative thinking, involves using knowledge and skills to create new products or enhance existing ones. Although there is a wealth of literature on innovative thinking skills, there is a lack of research on the challenges faced by science teachers in developing these skills in students. To fill this gap, this study aimed to explore the perspectives of science teachers on developing innovative thinking skills among secondary school students. The study used a phenomenological research design and involved 20 science teachers from 10 different secondary schools in Siirt, Türkiye. Criterion sampling, a purposive sampling method, was used in sample selection. Data were collected through semi-structured interviews, which were conducted in focus group interviews and lasted an average of 35 minutes. The interviews were analyzed using content analysis. The findings revealed that there are significant obstacles to cultivating innovative thinking skills among students. The most significant challenges were inadequate physical conditions, large class sizes, and parental attitudes and behaviors. These factors led to a challenging learning environment for students, making it difficult for them to develop the skills necessary for innovative thinking. For example, inadequate physical conditions, such as a lack of appropriate facilities or equipment, may hinder students' ability to engage in hands-on learning activities. Large class sizes may limit the amount of individual attention that each student receives, making it challenging for teachers to provide personalized guidance to students. Negative parental attitudes and behaviors towards science education may discourage students from pursuing science-related careers. The findings suggested that addressing these challenges is crucial for promoting scientific literacy and preparing students for the demands of the modern workforce. By understanding the obstacles that hinder the development of innovative

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thinking skills, policymakers, educators, and parents can work together to create a more conducive learning environment for students.

Keywords:
Science education, innovative thinking, curriculum

Introduction

Developments in science, technology, engineering and mathematics have affected people's lives in many ways. Today, developments in these fields are employed to solve many problems that people face (Bropy, et al. 2018). Countries that have recognized the global trends and transformations at an early stage have taken the initiative to revise their education programs accordingly. These countries attach great importance to science education, especially because of its relationship with scientific knowledge and technology. Therefore, the significance of educating the next generation of science experts and promoting science and technology literacy is growing in importance in maintaining the economic growth and sustainability of nations.

Twenty-first century competencies, the rapid change in science and technology, the changing needs of the individual and society as well as the innovations in learning-teaching approaches have a direct effect on the roles expected from individuals. Modern education aims to foster individuals who are capable of applying information in a practical manner, solving problems, thinking critically, being determined, communicating effectively, empathizing, and making valuable contributions to society and culture. The main goal of science courses today is to cultivate scientifically literate individuals who can incorporate science with mathematics, engineering, and technology, think beyond disciplinary boundaries, promote innovation, and apply their acquired knowledge and skills to produce new products (MEB, 2018).

The concept of innovation is thought to be equivalent to the concept of creativity. innovation seems like a concept that has entered our lives recently, in fact, it dates back to 16th century England (Kline & Rosenberg, 2010). Modern education system aims to develop individuals' creative thinking skills and to improve their ability to transfer their creative thinking to daily life. The products obtained as a result of creative thinking skills are shared with the society. Gravity, as a natural force, has existed since the inception of the world. Nonetheless, it was not until Newton's scientific assessment in 1687 that gravity was documented in the literature. The concepts of innovation and creativity are two different concepts. However they are confused by many people in our daily life. The most important distinguishing feature of these two concepts is the need for a creative process for innovation. Creative processes that are incapable of being transformed into monetary worth are typically not regarded as innovations. Amabile (1997), known for her work on creativity and innovation, expressed the relationship between creativity and innovation as ‘the first step towards creativity’. Individuals perform creativity alone, whereas innovation is a collective achievement resulting from teamwork. Innovation emerges from the necessity inspired by creative concepts, as creativity is a cognitive process (Tanner, 1994), while innovation is a social process (Rank et al., 2004).

There are many studies on engineering and design-based innovation skills in the literature. The majority of these studies focused on design-based skills. However, recent studies in the literature have also revealed field-specific research. The number of studies on innovation, technology and engineering concepts, especially in the field of science, has increased since 2010. Such studies generally focused on identifying and defining innovation skills. For example, Demirel and Seckin (2008) examined the effects of knowledge and knowledge sharing on innovation in their study. In a different study, examining science teachers' views on laboratory conditions and use, and their tendencies to follow technological innovations, Demir et al., (2011) found that science teachers needed in-service training on innovations in the use of laboratories and technology in

education. They concluded that that there were limitations in the implementation of these trainings due to the inadequacy of the conditions in the schools. Besides, science teachers in Capobianco' study(2011) thought that teaching science through design was both interesting and complex. Also Hsu, et al. (2011) found that pre-service teachers acknowledged the significance of engineering, technology, and design; however, they lacked comprehension of these ideas and felt inadequate to instruct these subjects.

Purpose of the research

The purpose of this study was to examine the opinions of secondary school science teachers about developing innovation skills in secondary school students.

Research Problem

The main research problem of this study was follows: "What are the opinions of science teachers about developing innovation skills in secondary school students ?"

Assumptions and Limitations of the Research

It was assumed that the 20 science teachers in the study group possessed similar pedagogical knowledge owing to their four-year undergraduate degrees. The study is restricted to the interview questions developed by the researchers and 20 science teachers.

Method

Research Model

In this study, phenomenology design, one of the qualitative research methods, was used. Qualitative research has the advantage of comprehensively elucidating the reality of specific cases and encompassing various factors in the environment (Rahman, 2020). Phenomenology examines lived experiences, perceptions, concepts, orientations, and situations in detail. By analyzing what distinct individuals comprehend from the same concept, phenomenological research patterns can identify and differentiate meanings (Giorgi & Giorgi, 2003). Focus group interviews were conducted to collect data in the study. Focus group interview is a qualitative data collection technique frequently used in action research. The purpose of focus group interview is to obtain in-depth, detailed and multidimensional qualitative information about the perspectives, lives, interests, experiences, tendencies, thoughts, perceptions, feelings, attitudes and habits of the participants about a particular subject (Stewart & Shamdasani, 1990; Kitzinger, 1995). Collecting detailed data through focus group interviews can provide a strong foundation for conducting one-on-one interviews and surveys (Kitzinger, 1995).

Participants

In the study, focus group interviews were conducted with 20 science teachers working in 10 different secondary schools in Siirt. The participation was on a voluntarily basis and ethical permission for the research was obtained from the Social and Human Sciences Research Ethics Committee of Firat University. In addition, legal permissions were obtained from the Siirt Provincial Directorate of National Education. The descriptive information about the participants is summarized in Table 1.

Table 1. Descriptive Information about Participants

	Frequency (f)	Percentage (%)
Gender		
Female	8	40
Male	12	60
Age		
25-30 years old	5	25
31-35 years old	11	55

36-40 years old	4	20
Educational Status		
BA	17	85
MA	2	10
PhD	1	5
Work experience		
1-5 years	9	45
6-10 years	9	45
11-15 years	1	5
16-20 years	1	5
21 years and above	-	

As seen in Table 1, eight of the participants were female and 12 were male. The majority (55%) of the participants were in the 31-35 age group. Of the 20 participants, 17 (85%) had BA degree, 2 (10%) MA degree, and 1 (5%) PhD degree. Nine (45%) of the 20 participants had 1-5 years of work experience, nine (45%) had 6-10 years of work experience, one (5%) had 11-15 years of work experience, and one (5%) 5) had 16-20 years of work experience. Instead of using their real names, the participants were given code names such as T_1, T_2, T_3, T_4, etc.

Data Collection Tools

In order to collect data, focus group interviews were conducted. A semi-structured interview form was developed by the researchers for focus group interviews. An "expert review" strategy was adopted in the development of the form. To develop the data collection tool, the researchers initially reviewed national and international sources on innovation and produced a preliminary data collection form. To enhance the content validity, two science education faculty members were consulted for their expert opinions, and the form was revised based on their suggestions. Finally, the form was revised and finalized. The questions in the form were:

In your opinion, what are the essential skills that students should acquire to develop innovative thinking?

When you engage in activities to improve innovative thinking skills in students, what aspects do you focus on?

What techniques, approaches, or models do you use to develop innovative thinking skills in students?

What challenges have you encountered while trying to develop innovative thinking skills in students?

What are your views on the attitudes, behaviors, and roles of leaders in promoting innovative thinking skills?

How effective do you think the current science curriculum (2018 Science Curriculum) is in fostering innovative thinking skills?

What recommendations or suggestions do you have to facilitate the development of innovative thinking skills in a systematic and efficient way?

In order to gain in-depth information, additional questions were asked to the participants during the course of the interviews.

Data Collection Process

Focus group interviews were held at the schools where the teachers work. Before the meeting time, the researcher and a reporter went to the school where the meetings would be held, arranged the meeting place and prepared the sound recording equipment. In the literature, it is emphasized that at least 10 minutes should be given to each participant for focus group discussions and that each focus group meeting should be carried out with 3-10 participants (Debus, 1999). In the current study, focus group interviews were conducted taking into account these issues mentioned in the literature. The number of participants participating in each focus group meeting, the dates of the focus group interviews and the duration of the focus group interviews are given in Table 2.

Table 2. Timeline of Focus Group Discussions

Focus Group	The number of participants	Date	Duration
1. Focus Group	4	27/12/2020	70 min
2. Focus Group	4	03/01/2021	45 min
3. Focus Group	4	10/01/2021	75 min
4. Focus Group	4	18/01/2021	60 min
5. Focus Group	4	23/01/2021	45 min

Analysis of Data

The data obtained from the focus group interviews were analyzed using content analysis technique. The main purpose of content analysis is to obtain concepts and relationships that can explain the collected data. For content analysis, firstly, each audio-recorded focus group interview was converted into written text and transcripts were created for each focus group interview. Each transcript was analyzed separately by three researchers (one of them was a doctoral student and the other two were advisors) and coding was performed. The statements from participants that were coded in the same way by all three researchers were labeled as "consensus", while the statements that were coded differently were labeled as "disagreement". The formula suggested by Miles and Huberman (1994) was used to ensure reliability: reliability = consensus / (consensus + disagreement) x100. Using formula, the reliability of the study was calculated as 94%. The statements of disagreement were re-negotiated by three researchers and a consensus was reached through expert opinions, and the coding was finalized.

Results

The first question asked to the participants in the Focus Group Interviews was as follows: In your opinion, what are the essential skills that students should acquire to develop innovative thinking? The answers of the participants are presented in Table 3. The expression “n” in the table indicates the number of participants, and the expression “%” indicates the percentage of participants. The code names of the teachers are provided in Table 3.

Table 3. The skills that the participants perceive as essential for students to acquire while developing innovative thinking skills

Basic Skill	n	%	Teacher Codes
Creativity Skills	12	60	T_1, T_3, T_4, T_5, T_7, T_8, T_{10}, T_{11}, T_{13}, T_{15}, T_{18}, T_{19},
Authenticity Skills	13	65	T_2, T_3, T_4, T_6, T_7, T_8, T_{10}, T_{11}, T_{13}, T_{15}, T_{17}, T_{18}, T_{19},
Free Thinking Skills	17	85	T_1, T_2, T_3, T_5, T_6, T_7, T_9, T_{10}, T_{11}, T_{12}, T_{14}, T_{15}, T_{16}, T_{17}, T_{18}, T_{19}, T_{20}
Critical Thinking Skills	17	85	T_2, T_3, T_4, T_5, T_6, T_8, T_9, T_{10}, T_{11}, T_{12}, T_{13}, T_{14}, T_{15}, T_{16}, T_{17}, T_{18}, T_{19},
Entrepreneurship Skills	11	55	T_1, T_3, T_4, T_6, T_7, T_9, T_{12}, T_{13}, T_{14}, T_{17}, T_{18},
Confidence	10	50	T_2, T_4, T_6, T_7, T_9, T_{11}, T_{12}, T_{14}, T_{15}, T_{18},
Innovative Thinking Skills	15	75	T_1, T_2, T_3, T_4, T_6, T_7, T_9, T_{10}, T_{11}, T_{13}, T_{14}, T_{15}, T_{16}, T_{17}, T_{20}
Analytical Thinking Skills	16	80	T_1, T_3, T_4, T_5, T_6, T_8, T_9, T_{10}, T_{11}, T_{12}, T_{13}, T_{15}, T_{16}, T_{18}, T_{19}, T_{20}
Technology Literacy Skills	10	50	T_2, T_3, T_5, T_7, T_8, T_{11}, T_{12}, T_{13}, T_{17}, T_{19},

Engineering Skills	8	40	T_1, T_3, T_5, T_6, T_{12}, T_{14}, T_{15}, T_{16},
Problem Solving Skills	13	65	T_2, T_3, T_5, T_7, T_8, T_9, T_{10}, T_{12}, T_{14}, T_{16}, T_{17}, T_{18}, T_{20}
Communication skills	6	30	T_2, T_4, T_7, T_8, T_9, T_{20}
Teamwork and Collaboration Skills	4	20	T_5, T_7, T_{15}, T_{17}, T_{20}

The skills considered essential for students to develop in the process of acquiring innovative thinking skills are led by free thinking skills (85%) and critical thinking skills (85%), followed by innovative thinking skills (75%). The least emphasized learning skills were teamwork and collaboration skills (20%) and independent learning skills (35%). The following is T11's opinion on the skills that students should acquire in order to gain innovative thinking skills:

> T_{11}: *"I think it will be positive for students to transform and exhibit what they have learned throughout the academic year into products. Because when students integrate scientific knowledge with innovative thinking skills and transform it into a product, their problem-solving skills will develop and individuals who are suitable for the requirements of the age will be raised. In this context, I think that including science and engineering applications from primary school will contribute to students' problem-solving, critical thinking, innovative thinking, creative and collaborative skills."*

In addition, T_5 expressed:

> T_5: *"Since students will work in groups, it will also contribute to their socialization and develops their sense of self-confidence. Because he will produce something, so he will taste the feeling of success."*

The second question was as follows: When you engage in activities to improve your innovative thinking skills, what aspects do you focus on? The answers given of the participants are presented in Table 4. In the table, the expression "n" indicates the number of participants, and the expression "%" indicates the percentage of participants. The code names of the teachers are provided in Table 4.

Table 4. The aspects that teachers focus on in the activities they do to develop innovative thinking skills in students

	n	**%**	**Teacher Codes**
I aim to reveal the individual talents of the students.	15	75	T_2, T_3, T_4, T_5, T_6, T_8, T_9, T_{11}, T_{12}, T_{13}, T_{14}, T_{15}, T_{17}, T_{19}, T_{20}
I aim to reveal students' interests.	8	40	T_1, T_4, T_6, T_9, T_{12}, T_{14}, T_{17}, T_{18},
I take into account the readiness level of the students.	12	60	T_1, T_3, T_4, T_7, T_9, T_{10}, T_{13}, T_{14}, T_{15}, T_{16}, T_{19}, T_{20}
I aim to arouse curiosity in students.	17	85	T_1, T_2, T_4, T_5, T_7, T_8, T_9, T_{10}, T_{11}, T_{13}, T_{14}, T_{15}, T_{16}, T_{17}, T_{18}, T_{19}, T_{20}
I ensure active participation of students in learning processes.	16	80	T_1, T_2, T_3, T_4, T_6, T_7, T_8, T_{10}, T_{11}, T_{13}, T_{14}, T_{15}, T_{16}, T_{18}, T_{19}, T_{20}
I relate my lessons to the daily lives of students.	9	45	T_1, T_3 T_6, T_{10}, T_{11}, T_{15}, T_{16}, T_{18}, T_{19},
I use information and communication technologies effectively.	10	50	T_3, T_5, T_6, T_7, T_8, T_{11}, T_{13}, T_{15}, T_{16}, T_{19},

Table 4 revealed that most of the teachers (85%) tried to arouse curiosity in the students. In addition, 80% of the participants paid attention to ensure the active participation of students in the learning processes and 75% declared that they aimed to reveal the individual talents of the students. Furthermore, 60% stated that they considered students' readiness levels, 50% stated that they used information and communication technologies effectively, 45% stated that they linked their lessons with students' daily lives, 40% stated that they aimed to reveal students' interests. The opinion of T_3 on the aspects that he/she focus on in the activities to develop innovative thinking skills in students were as follows:

> T_3: *"It is very important as it will enable the lessons and subjects to be associated with life and transferred to life..... The student will say, "I am learning these subjects, but I wonder where I need them*

in life, where can I use them? Well, that's the information for me. Information exists to solve the problem. It's nice to be associated with innovation. I think that is the right thing."

Similarly, T_7 stated that:

T_7: *"I think that activities with innovative falling skills will contribute to the training of individuals who research, question, define and solve a problem and produce a product. For this reason, these activities will contribute positively to the training of scientifically literate individuals and to the self-renewal and development of teachers."*

The third question was as follows: What techniques, approaches, or models do you use to develop innovative thinking skills in students? The answers of the participants are presented in Table 5. In the table, the expression "n" indicates the number of participants, and the expression "%" indicates the percentage of participants. The code names of the teachers are provided in Table 5.

Table 5. What techniques, approaches, or models teachers use to develop innovative thinking skills in students

	n	**%**	**Teacher Codes**
I do problem-focused thinking activities.	16	80	T_2, T_3, T_4, T_5, T_6, T_7, T_8, T_{10}, T_{11}, T_{12}, T_{13}, T_{14}, T_{15}, T_{16}, T_{17}, T_{19},
I do brainstorming activities.	12	60	T_4, T_6, T_7, T_8, T_{10}, T_{11}, T_{12}, T_{13}, T_{14}, T_{15}, T_{17}, T_{19},
I do modeling and visualization activities for curriculum topics.	10	50	T_3, T_4, T_5, T_7, T_{10}, T_{11}, T_{13}, T_{16}, T_{18}, T_{19}
I do activities to discuss successful innovation examples from the past and today.	8	40	T_1, T_3, T_6, T_{10}, T_{13}, T_{15}, T_{16}, T_{19},
I do observation activities.	15	75	T_1, T_3, T_5, T_6, T_7, T_8, T_9, T_{10}, T_{11}, T_{13}, T_{14}, T_{16}, T_{17}, T_{18}, T_{19}
I do experiment activities.	16	80	T_2, T_3, T_4, T_5, T_6, T_7, T_8, T_9, T_{10}, T_{11}, T_{13}, T_{14}, T_{15}, T_{16}, T_{17}, T_{19}
I do field trips.	10	50	T_1, T_3, T_7, T_8, T_{10}, T_{14}, T_{16}, T_{17}, T_{18}, T_{19}
We participate in scientific fairs.	8	40	T_1, T_2, T_9, T_{13}, T_{14}, T_{15}, T_{16}, T_{20}
We participate in project competitions.	15	75	T_1, T_4, T_5, T_6, T_8, T_9, T_{10}, T_{11}, T_{12}, T_{13}, T_{15}, T_{16}, T_{17}, T_{18}, T_{19},

As shown in Table 5, problem-focused thinking and experimental activities were the most popular activities, with 80% of teachers preferring these methods. Observation activities and participation in project competitions were the second most popular, with a rate of 75%. 60% of teachers reported using brainstorming, while half of the teachers reported using modeling and visualization activities for curriculum topics. Field trip activities were reported by 50% of the participants, and 40% reported discussing successful innovation examples with their students. Finally, 40% of the participants reported participating in scientific fairs. The opinions of T_8 techniques, approaches, or models he/she use to develop innovative thinking skills in students:

T_8: *"When we look at the achievements, we see that the students first put forward their designs with drawings, and if the conditions are suitable, they can transform them into a three-dimensional model. This indicates that the gains are feasible. However, during the product development phase, the task of experimenting, recording observations, reading graphics or developing strategies to market the product can be difficult for some students. In addition, many reasons such as the inadequacy of the existing structure of the schools, the lack of laboratories and materials, the overcrowding of the classes, the indifference of the students can make the applicability of the acquisitions difficult."*

In addition, T_{10} expressed that:

T_{10}: *"Students should be taken to the relevant places for excursions. In this way, their attitudes towards lessons, practices and studies can be positively encouraged. Scientific products should be designed and given the opportunity to sell them."*

The fourth question in the Focus Group Discussions was: What challenges have you encountered while trying to develop innovative thinking skills in students? The answers of the participants are presented in Table 6. In the table, the expression "n" indicates the number of participants, and the expression "%" indicates the percentage of participants. The code names of the teachers are provided in Table 6.

Table 6. Main challenges faced by participants while trying to develop innovative thinking skills in students

	n	%	Teacher Codes
The physical conditions of the school and the classroom are a problem encountered in the process of providing students with innovative thinking skills.	17	85	T_2, T_3, T_4, T_5, T_6, T_7, T_8, T_9, T_{10}, T_{12}, T_{13}, T_{14}, T_{15}, T_{16}, T_{17}, T_{18}, T_{19}
Crowded classrooms are a problem encountered in the process of providing students with innovative thinking skills.	15	75	T_1, T_3, T_4, T_5, T_6, T_8, T_{10}, T_{12}, T_{13}, T_{14}, T_{15}, T_{16}, T_{18}, T_{19}, T_{20}
Inadequacy of materials and equipment is a problem encountered in the process of providing students with innovative thinking skills.	14	70	T_1, T_3, T_4, T_6, T_7, T_9, T_{10}, T_{11}, T_{12}, T_{14}, T_{16}, T_{17}, T_{18}, T_{19}
Students' readiness levels are a problem encountered in the process of providing students with innovative thinking skills.	12	60	T_1, T_3, T_4, T_5, T_8, T_9, T_{11}, T_{15}, T_{16}, T_{17}, T_{18}, T_{20}
The socio-economic level of the family is a problem encountered in the process of providing students with innovative thinking skills.	13	65	T_2, T_4, T_5, T_6, T_7, T_9, T_{11}, T_{13}, T_{14}, T_{15}, T_{17}, T_{19}, T_{20}
The attitudes and behaviors of parents are a problem encountered in the process of providing students with innovative thinking skills.	15	75	T_1, T_2, T_3, T_5, T_6, T_7, T_9, T_{10}, T_{11}, T_{12}, T_{14}, T_{15}, T_{16}, T_{17}, T_{19}

As shown in Table 6, the physical conditions of both the school and classroom were the primary challenges faced when trying to teach students innovative thinking skills, with 85% of participants reporting this issue. Second on the list, at a rate of 75%, were issues such as crowded classrooms and the attitudes and behaviors of parents. Inadequate materials and equipment ranked third, with 70% of participants reporting this as a problem. The socio-economic status of families was seen as a problem by 65% of participants, and 60% mentioned that students' insufficient readiness level was also an issue in the process of providing innovative thinking skills. The opinions of T_{10} challenges faced when trying to teach students innovative thinking skills are presented below.

T10: "I think it puts a serious workload on the teacher in secondary school. Because the classrooms are overcrowded and the opportunities are limited. I don't think it will be a problem if we have special tools and necessary materials. Class size is also important, and in this case, the school's facilities are also very important. I think its application in every school is a little more limited."

In addition, T13 expressed that:

T13: "The location, conditions and physical facilities of the school are also very important. These situations can negatively affect and limit children. I think that such problems will be more especially in regional boarding schools, I can say this very clearly since I myself worked in regional boarding school before and I know the conditions. If the child does not come with the necessary preparation at the beginning of the week, there is no chance to make up for it during the week. That's why, as I said, I don't think there will be a problem in the city center or if the facilities are good, but I think its applicability may not be the same in every school and the desired efficiency."

The fifth in the Focus Group Discussions was: What are your views on the attitudes, behaviors, and roles of leaders in promoting innovative thinking skills? The answers of the participants are presented in Table 7. In the table, the expression "n" indicates the number of participants, and the expression "%" indicates the percentage of participants. The code names of the teachers are provided in Table 7.

Table 7. The participants' views on the attitudes, behaviors, and roles of leaders in promoting innovative thinking skills.

	n	%	Teacher Codes
Administrators provide infrastructure and equipment for students to gain innovation skills.	10	50	T_3, T_4, T_6, T_7, T_{10}, T_{14}, T_{15}, T_{16}, T_{17}, T_{20}
Administrators believe in the necessity of providing students with innovation skills.	8	40	T_3, T_5, T_6, T_7, T_8, T_{18}, T_{19}, T_{20}
Administrators provide sufficient support in the process of acquiring innovative thinking skills in educational environments.	8	40	T_4, T_6, T_8, T_{12}, T_{14}, T_{15}, T_{16}, T_{17},
Administrators are aware of the problems that prevent students from gaining innovative thinking skills.	10	50	T_2, T_4, T_6, T_7, T_9, T_{11}, T_{13}, T_{14}, T_{16}, T_{17},
Administrators strive to solve problems that prevent students from gaining innovative thinking skills.	6	30	T_2, T_7, T_8, T_9, T_{19}, T_{20}

Table 7 revealed that 50% of participants believed that administrators provided infrastructure and equipment to help students develop innovative thinking skills, while the same percentage also believes that administrators were aware of the problems that may hinder students from developing these skills. 40% of participants believed that administrators understood the importance of teaching innovative thinking skills to students, while 40% thought that administrators provided sufficient support for the process of developing these skills. On the other hand, 30% of participants believed that administrators made an effort to solve the problems that may prevent students from gaining innovative thinking skills. The opinion of T_{14} about views on the attitudes, behaviors, and roles of leaders in promoting innovative thinking skills are presented below.

> *T14: "School administrators' differences should be taken into account in terms of applicability. Not every manager has enough knowledge. Not having enough knowledge means not being able to apply it. An administrator who does not have sufficient knowledge about the subject cannot do anything. Therefore, being able to make these applications requires infrastructure. In addition, the course times may not be enough."*

The sixth question in the Focus Group Interviews was as follows: How effective do you think the current science curriculum (2018 Science Curriculum) is in fostering innovative thinking skills? The answers of the participants are presented in Table 8. In the table, the expression "n" indicates the number of participants, and the expression "%" indicates the percentage of participants. The code names of the teachers are provided in Table 8.

Table 8. Opinions of teachers on the development of innovative thinking skills in the current science curriculum (2018 Science Curriculum)

	n	%	Teacher Codes
Existing science programs are sufficient to provide innovative thinking skills.	8	40	T_2, T_3, T_7, T_9, T_{10}, T_{13}, T_{15}, T_{16},
Existing science programs have unnecessary aspects to give students innovative thinking skills.	3	15	T_1, T_{19}, T_{20}
Existing science programs have shortcomings to provide students with innovative thinking skills.	5	25	T_4, T_6, T_{11}, T_{14}, T_{18}
Existing science programs should be improved to provide students with innovative thinking skills.	4	20	T_5, T_8, T_{12}, T_{17}

Table 8 showed that 40% of participants hold the view that the current science programs were adequate for developing innovative thinking skills. Conversely, 25% of participants believed that the current programs were insufficient in this regard. Additionally, 20% stated that the existing science programs required improvement and 15% expressed that particular components of the current programs were unnecessary.

The seventh question in the Focus Group Meetings was as follows: What recommendations or suggestions do you have to facilitate the development of innovative thinking skills in a systematic and efficient way? The answers of the participants are presented in Table 9. In the table, the expression "n" indicates the number of participants, and the expression "%" indicates the percentage of participants. The code names of the teachers are provided are also shown in Table 9.

Table 9. Suggestions to facilitate the development of innovative thinking skills in a systematic and efficient way

	n	**%**	**Teacher Codes**
In order to provide students with innovative thinking skills, pre-service teachers should be trained on innovation in their undergraduate education.	16	80	T_1, T_3, T_5, T_6, T_8, T_9, T_{10}, T_{11}, T_{12}, T_{13}, T_{14}, T_{15}, T_{17}, T_{18}, T_{19}, T_{20}
In order to provide students with innovative thinking skills, teachers should be given complementary and supportive training on innovation in in-service training.	15	75	T_1, T_2, T_3, T_5, T_6, T_8, T_{10}, T_{11}, T_{12}, T_{13}, T_{14}, T_{16}, T_{17}, T_{19}, T_{20}
Physical conditions should be improved in order to provide students with innovative thinking skills.	14	70	T_1, T_3, T_4, T_5, T_7, T_8, T_{10}, T_{12}, T_{13}, T_{14}, T_{15}, T_{17}, T_{18}, T_{20}
Materials and technical opportunities should be increased in order to provide students with innovative thinking skills.	18	90	T_1, T_2, T_3, T_4, T_5, T_6, T_7, T_8, T_9, T_{10}, T_{12}, T_{13}, T_{14}, T_{15}, T_{16}, T_{17}, T_{18}, T_{19},
Class sizes should be reduced in order to provide students with innovative thinking skills.	12	60	T_1, T_3, T_4, T_5, T_7, T_9, T_{12}, T_{13}, T_{14}, T_{15}, T_{17}, T_{19},
The education system should be revised in order to provide students with innovative thinking skills.	15	75	T_1, T_2, T_4, T_5, T_7, T_8, T_{10}, T_{12}, T_{13}, T_{14}, T_{15}, T_{16}, T_{18}, T_{19}, T_{20}
In order to provide students with innovative thinking skills, the test-oriented measurement of course success should be abandoned.	16	80	T_1, T_2, T_3, T_5, T_6, T_7, T_9, T_{10}, T_{11}, T_{13}, T_{14}, T_{15}, T_{16}, T_{18}, T_{19}, T_{20}
The number of science and technology fairs should be increased in order to provide students with innovative thinking skills.	14	70	T_1, T_3, T_5, T_6, T_7, T_8, T_{11}, T_{12}, T_{14}, T_{15}, T_{17}, T_{18}, T_{19}, T_{20}
The number of project competitions should be increased in order to provide students with innovative thinking skills.	12	60	T_2, T_5, T_6, T_8, T_9, T_{10}, T_{13}, T_{14}, T_{15}, T_{16}, T_{18}, T_{19}

Table 9 showed that the most popular suggestion, with a rate of 85%, was Materials and technical opportunities should be increased in order to provide students with innovative thinking skills". The second most popular suggestions, with a rate of 80%, were that "in order to provide students with innovative thinking skills, teacher candidates should be trained in innovation in undergraduate education" and "test exam-oriented measurement of course success should be abandoned in order to provide students with innovative thinking skills". The third most popular suggestions, with a rate of 75%, were that "Complementary and supportive training should be given to teachers on innovation in in-service training in order to provide students with innovative thinking skills" and "the education system should be revised to provide students with innovative thinking skills". The suggestions that "Physical conditions should be improved to provide students with innovative thinking skills" and "The number of science and technology fairs should be increased to provide students with innovative thinking skills" were ranked fourth with a rate of 70%. The least emphasized suggestions were that "class sizes should be reduced in order to provide students with innovative thinking skills" and "the number of project competitions should be increased in order to provide students with innovative thinking skills", each with a rate of 60%. The suggestions of T_{20} are presented:

> *T20: "I think teachers should also receive an in-service training. In fact, it should not be optional, it will be mandatory that no one will have the option of not going. A new breath has been brought to education, how important this innovation is, its advantages, in short, every aspect of it should be well understood by the teachers, they should be convinced so that they first believe in its effectiveness, learn the job and do something consciously with their students."*

Discussion and Conclusion

The development of innovation skills has become increasingly significant on a global level due to advancements in science and technology. This has led to a greater emphasis on innovation skills in various fields, including education. It is crucial for students to acquire and enhance their innovation skills to ensure they become well-prepared individuals who can adapt to the evolving expectations and demands of society. Examining the opinions of teachers, who are practitioners of educational activities, on innovation skills is very important in terms of guiding future studies on developing innovation skills in the learning-teaching process. In this study, the aim of which was to examine the opinions of science teachers on the development of innovation skills in secondary schools, the opinions of 20 science teachers working in 10 different schools in Siirt were obtained.

As a result of focus group interviews conducted with the participants, the most expressed statement by the participants was that students should be given free thinking skills and critical thinking skills in the process of developing innovative thinking skills. In the FINCODA innovation competency model, creativity, critical thinking, teamwork, networking, creativity and initiative skills are defined as basic innovation skills. It is also reported in the literature that critical thinking and creative thinking skills are the basic skills that should be acquired by individuals in the process of developing innovation skills (Fuad, 2017; Siburian et al., 2019; Daskolika et al., 2012).

It was found in the current study that science teachers played a crucial role in stimulating students' curiosity and encouraging their active participation in the learning process to foster their innovation skills. Furthermore, the study revealed that teachers mostly relied on experiments, observations, and participation in project competitions to enhance students' innovation skills. Previous research suggested that creating a technological learning environment promoting active participation and curiosity can be effective in generating innovative ideas. Other studies indicated that various activities such as drama, brainstorming, case studies, role-playing, debate, experiments, mind maps, music, social activities, projects, interdisciplinary studies, and utilizing WEB 2.0 tools could contribute to developing innovative thinking. (Cobo, 2013; Kivunja, 2014; Kholikova, 2021).

Another finding was that the physical conditions of the school and the classroom, the crowded classrooms and the attitudes and behaviors of the parents were the most common problems in the process of developing innovative thinking skills. This finding is in line with those in the literature. It is stated in the literature that the most common problems that teachers encounter in the process of developing innovative thinking skills are: crowded classrooms (Usherwood & Primhak, 1996; Azgin and Senler, 2019), insufficient physical and technological structures of schools and classrooms (Soobik, 2013), insufficient parent support (Grace et al., 2012), growing up with traditional education (Tucker, 2001) and insufficient curriculum (Dello-Iacovo, 2009).

The findings also revealed that the majority of science teachers believed that school administrators were aware of the problems in the process of developing innovation skills. The participants stated that school administrators tried to meet the infrastructure/hardware needs of the school. The majority of science teachers expressed that school administrators believed the necessity of developing innovation skills. The participants generally believed that the 2018 science curriculum was sufficient to provide innovative thinking skills, but they also stated that the programs had deficiencies. Science teachers thought that increasing the material and technical opportunities to gain innovative thinking skills, providing teacher candidates with education on innovation in the undergraduate period, and abandoning test-based measurement research in the evaluation of course success would increase the effectiveness of the process of developing innovative thinking skills. This finding is supported by previous studies. The studies in the literature reported that teachers' thoughts on this issue were as follows: School administrators believed that innovative thinking skills should be developed and

school administrators provided the required resource (Sahin & Aslan, 2008; Yilmaz & Beşkaya, 2018); The 2018 curriculum was sufficient for developing innovative thinking skills, however, it could be improved (Sarac & Yildirim, 2019). In this context, it can be argued that the findings of this study are in line with those in the literature.

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Investigation of Research on Digital Literacy in Education: A Science Mapping Study

Research Article

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ABSTRACT

The rapid and sustainable growth in digital technology requires individuals to have certain skills and competencies to perform tasks and solve problems in digital environments. Digital literacy is a set of skills required for 21st-century individuals to use digital tools to support them in achieving their goals. This conceptualization reflects digital literacy, the skills necessary for people to acquire information, communicate, and interact with others, find employment, achieve economic success, and participate actively in collaborative networks. Furthermore, digital literacy education refers to providing knowledge and skill-building processes through education and practices to improve students' digital literacy. In this regard, the purpose of this research is to determine the trends of studies on digital literacy and education in the context of digital literacy skills in the social studies curriculum. The bibliometric analysis method was employed in this study. The terms "digital literacy" and "education" were searched from the Web of Science Core Collection in order to obtain data. As a result of searching, 1012 studies were obtained. Studies were examined one by one, and only directly related studies were included in the study. Within the scope of the findings obtained, there has been an increase in studies on digital literacy and education since 1999, and the number of citations has increased in parallel with the number of studies. It can be said that the number of studies peaked in 2020. "Education and Information Technologies" and "Computers & Education" are in the first places among the journals in which studies are published. The Journals "Computers & Education" and the "British Journal of Educational Technology" are in the first two places in the citation order.

Keywords: Digital, Digital literacy, Education, Trend.

Introduction

The form of the clay tablet, the basic tool of reading in the adventure of humanity, has become a "tablet computer" nowadays with the contribution of knowledge and information and developing technology

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(Çakmak, 2013). With the progress made by societies, changes have been experienced in the definitions of reading, writing, and reader in the stages of the transition from clay tablets to tablet computers. When 'literacy' is addressed in terms of its etymology, it is seen that while "literacy" is used in English, the word "gramotnost" is preferred for literacy in Russian. The word "sevad" is used in Persian, an Indo-European language. Literacy describes the versatile ability to carry out tasks that make life meaningful and sustain daily life. In this sense, literacy describes awareness to a significant extent. Moreover, it also involves developing behavior in the direction of that awareness. For example, it can be stated that displaying a series of behaviors, such as reacting, giving a message, making a sound, and taking a stand, is within the scope of literacy. In that case, in addition to knowing, literacy also includes exhibiting developed/advanced/high-level skills and/or abilities in that direction (İnan, 2021). Traditionally, the concept of literacy refers to the cognitive competencies required for reading and writing and students' ability to utilize these abilities effectively to understand the text more deeply (Barton, 2007). Novel approaches toward literacy regard it as a social practice that changes according to the social context. These have implications for how reading and writing are taught and developed (Jewitt et al., 2010; Street, 2017). At the global level, the concept of literacy is expanding to include the individual, society, and environment due to the rapid change of the cultural environment and the role of literacy in ensuring individual, social, and cultural development. Concerning the definition of literacy, it can be expressed as the ability to define, understand, interpret, create, calculate, and communicate using visual, audio, and digital materials between disciplines and in any context (Demirtaş, 2022). Upon examining the term digital literacy in the context of the study, it was expressed by Paul Gilster in his book "Digital Literacy" in 1997. In his book, the author defined digital literacy as "presenting information in multiple formats that the computer can offer by focusing on the ability to understand, evaluate, and use information." In another definition, digital literacy is expressed as a set of competencies that guide the person to utilize digital devices effectively in the digital age, such as easily accessing data, evaluating, analyzing, applying, and synthesizing data, in addition to creating new knowledge (Ferrari, 2012). The concept of digital literacy differs from traditional print literacy because it refers to functioning in digital media containing various 'texts' (alphanumeric, pictorial, and audio). The ability to 'read' these different types of text is a necessary prerequisite for utilizing them in a sensible way. The conceptual framework of 'digital literacy' (Gilster, 1997) exceeds the technical skills required to master a digital technology and is stated to involve the skills of teachers and students to effectively use a wide range of complex cognitive, social, and emotional abilities to understand and read reading materials. Gilster (1997) strongly emphasizes that digital literacy should not be simply regarded as "a guide on how to navigate the Internet." Furthermore, he indicates that the ability to assess and interpret information is crucial. It can be said that Gilster's concept is based on computer/information competencies focusing on information evaluation and information collecting skills along with a set of understandings and attitudes. The term digital literacy has been expanded and stated to include all the specific skills and competencies required to search, find, evaluate, and process information with a computer (Bawden, 2008). In addition to these, it has been indicated that the rapid development of digital technologies requires individuals to have constantly expanding skills to use these technologies (Limaye et al., 2015). According to UNESCO (2018), digital literacy is more than knowing how to use a computer. It can be said to include basic skills in addition to life skills applicable to all aspects of modern life (Khan et al., 2022).

It can be stated that the rapid and continuous growth of digital technology requires individuals to have the necessary skills and competencies to carry out tasks and solve problems in digital environments. Digital literacy represents a set of skills required for 21st-century individuals to utilize digital tools in order to support them in reaching their goals. The said conceptualization reflects the skills required for people to obtain information, communicate and interact with others, find a job, achieve economic success, and participate actively in collaborative networks (Shopova, 2014). In the context of education, digital literacy education refers to supporting the knowledge and skill-building processes of students through education and practices to

enhance their digital literacy. Improving students' literacy levels and digital competencies is important to increase the effectiveness and efficiency of the learning process and for students to adapt to the dynamically changing labor market. It is considered important to reveal the current condition of digital literacy in terms of determining the direction of research. It will be important in the planning of future studies according to the trend of research. In this respect, the purpose of the present study is to reveal the trends of research on digital literacy and education.

Methodology

In the present study, the science mapping method was employed to examine published research on digital literacy in education. Science mapping or bibliometric mapping is a significant research subject in the field of bibliometrics (Morris & Van Der Veer Martens, 2008; van Eck & Waltman, 2010). It tries to find representations of intellectual connections within the dynamically changing scientific knowledge system (Small, 1997). In other words, science mapping aims to reveal the structural and dynamic aspects of scientific research (Börner, Chen and Boyack, 2003; Morris and Van Der Veer Martens, 2008, Noyons, Moed and Luwel, 1998).

The publications examined in the study were accessed from the Web of Science (WoS) database. The WoS database was preferred in this study in order to reach related researches since it has more resources, especially in the field of social and human sciences, compared to other databases and presents search results with different features than other databases (Falagas et al., 2008; Karasözen, Bayram and Zan, 2011).

The PRISMA diagram was followed to access the publications to be examined in the study. Accordingly, first, the relevant search terms were defined for the search engine, then the education-related categories of WoS were selected, and finally, the titles and abstracts of the viewed publications were examined one by one, and the publications to be examined in accordance with the main purpose of the research were reached. Figure 1 shows the PRISMA diagram to access the related research.

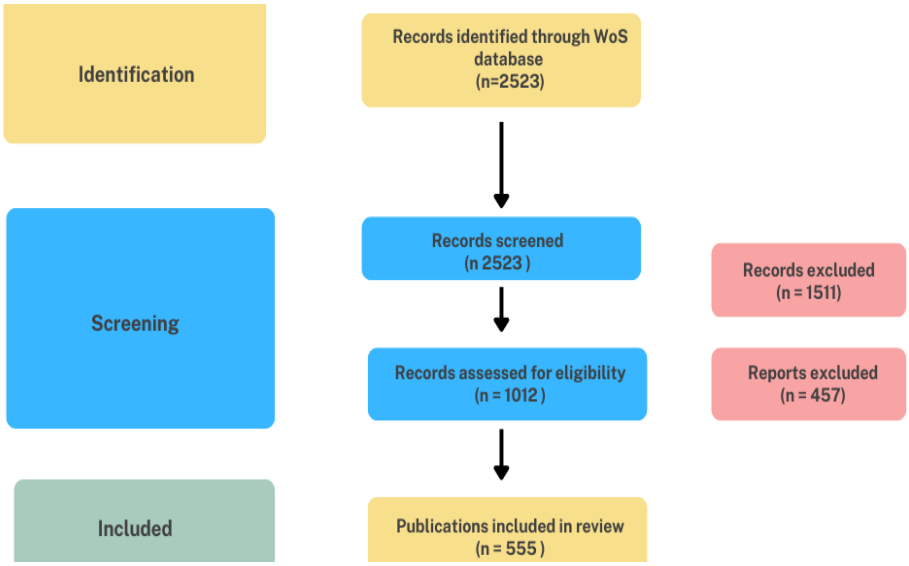


Figure 1. PRISMA Diagram

As seen in Figure 1, to access the publications to be examined in the research, the search terms "digital literacy" (All Fields) and "education" (All Fields) were defined in the WoS database, and it was observed that 2523 publications were viewed. Afterward, the "Education & Educational Research" category, one of the WoS categories, was marked, and it was seen that 1012 publications were viewed. Finally, the titles and abstracts of 1012 publications were reviewed by the researcher one by one, 457 publications were determined to be irrelevant to the purpose of the study and were excluded from the data set. Five hundred fifty-five publications

acquired at the end of this process were included in the data analysis of the research. Figure 2 presents information about the data set of the study.

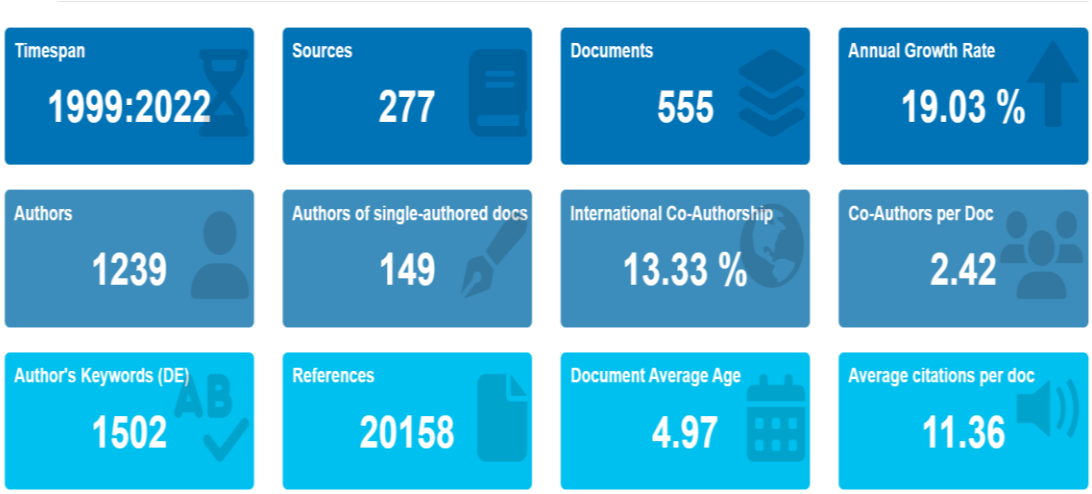


Figure 2. General information about the dataset

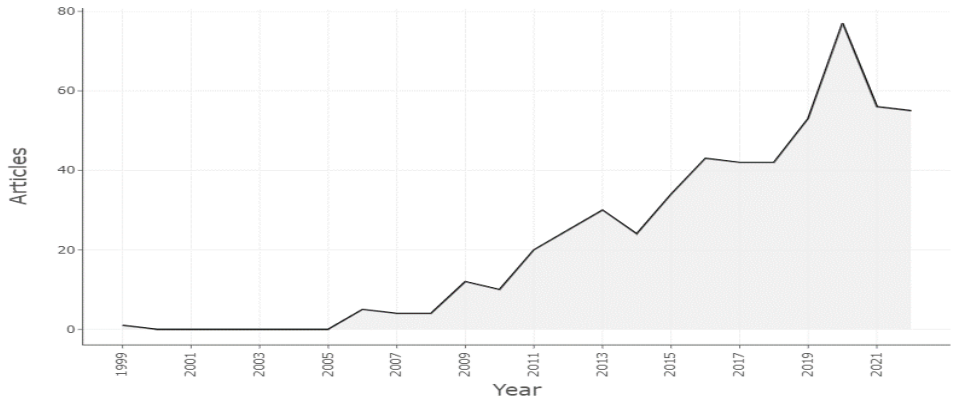
As seen in Figure 2, 555 documents from a total of 277 sources were accessed. The publications analyzed in the study were published between 1999 and 2022. There is information on 1239 authors in the acquired data set. Of the 555 documents, 149 are single-authored publications. There are a total of 1502 author's keywords and 20158 references in the data set. Additionally, it was found that the average age of the documents obtained was approximately 5 years, and each document received an average of 11.36 citations.

The research data were analyzed with the biblioshiny package of the R program. To this end, the name, author information, abstract, keywords, and references of the 555 publications acquired from the WoS database were combined into a file in the plain text format, and the relevant file was transferred to the R program and analyzed in line with the study's purpose.

Findings

The results acquired from the analysis were evaluated concerning the general information about the research, and a total of 555 studies published between 1999 and 2022 were analyzed in terms of the interrelationship of research, the relations between authors, countries, and institutions where researchers work and the relationship between the study and the subjects studied, and the network relations of certain authors and concepts. The distribution of studies by years is presented in Graph 1. The 10 most effective ones among the author, study, citation, journal, etc. examined in the research were studied.

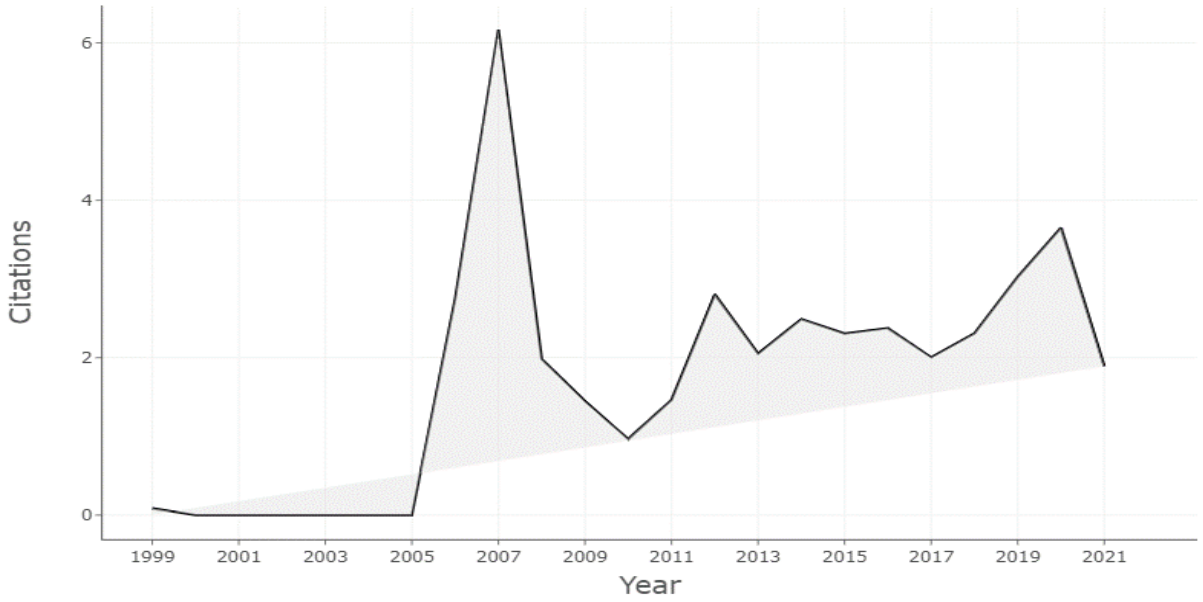
Annual Scientific Production



Graph 1. Annual Scientific Production

As seen in Graph. 1, the first of the publications on education and digital literacy in the WoS database was accessed in 1999. It can be indicated that the studies increased after 2005 and peaked in 2020. The annual average number of publications was found as 19.03 between 1999 and 2022.

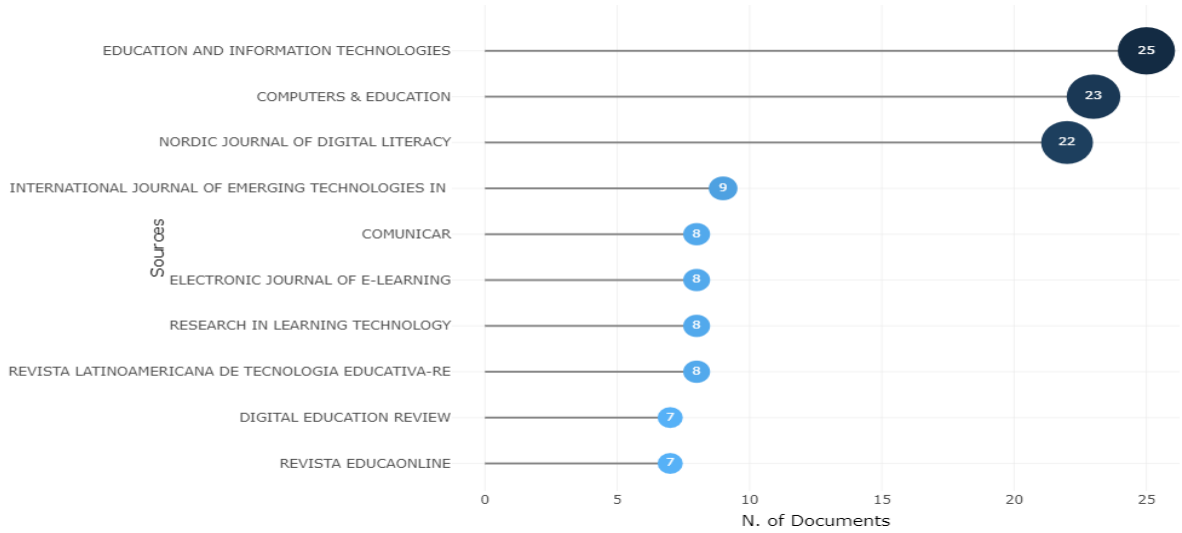
Average Citation Per Year



Graph 2. Average Citation Per Year

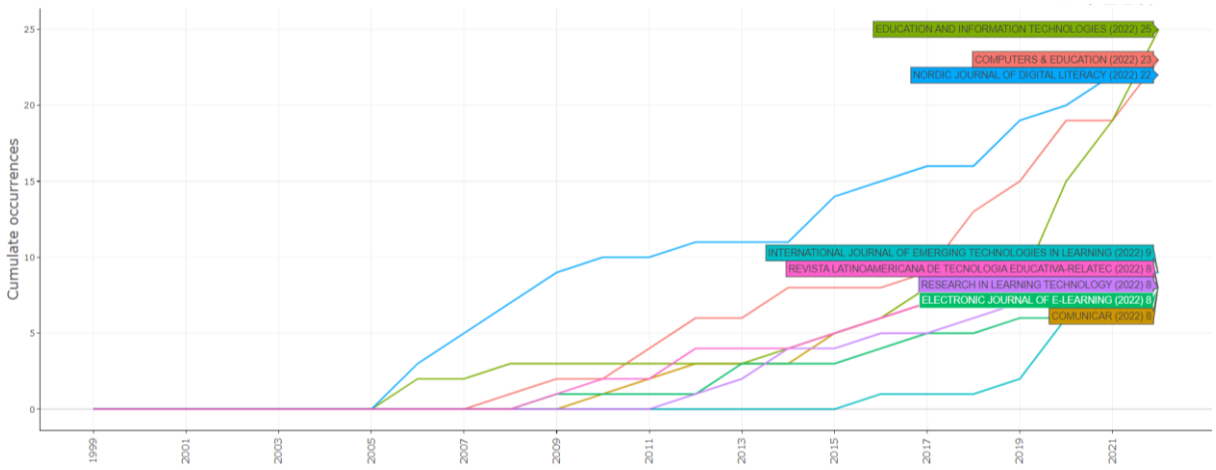
As seen in Graph …, when the citations received by the publications on education and digital literacy in the WoS database are reviewed, it can be emphasized that an increase similar to the increase in the number of studies started in 2005. This increase peaked in 2007. Despite fluctuations in the citations received by the studies during the process, it can be said that there was a sharp increase again in 2020. The number of citations received by the studies started to decrease after 2020.

Top Ten Most Relevant Sources



Graph 3. Most Relevant Sources

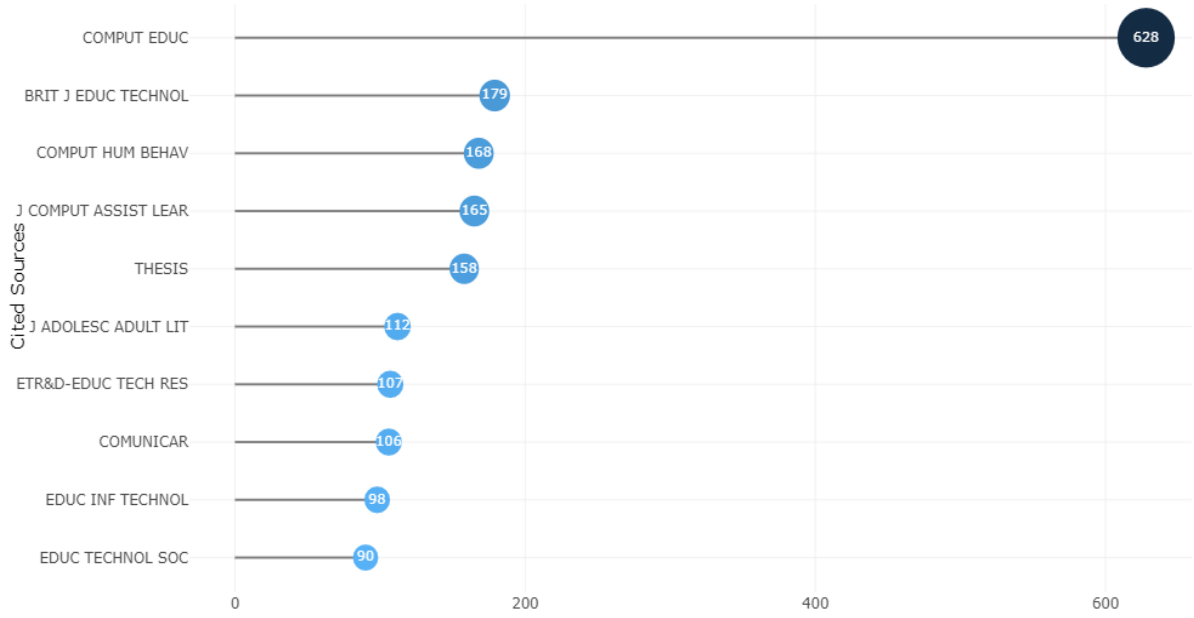
As seen in Graph. 3, the journal "Education and Information Technologies" is the journal with the highest number of publications on education and digital literacy in the WoS database, followed by "Computers & Education" and "Nordic Journal of Digital Literacy." One of the points to be indicated is that the journals in which publications are made are important journals in the field.



Graph. 4. Source Dynamics

The direction and rate of the increase observed in the number of publications in Graph. 4 can also be seen in the line graph. It can be stated that the journal "Education and Information Technologies" displayed a sharp increase in the graph. The journal "Computers & Education" showed a similar increase.

Top Ten Most Cited Local Sources

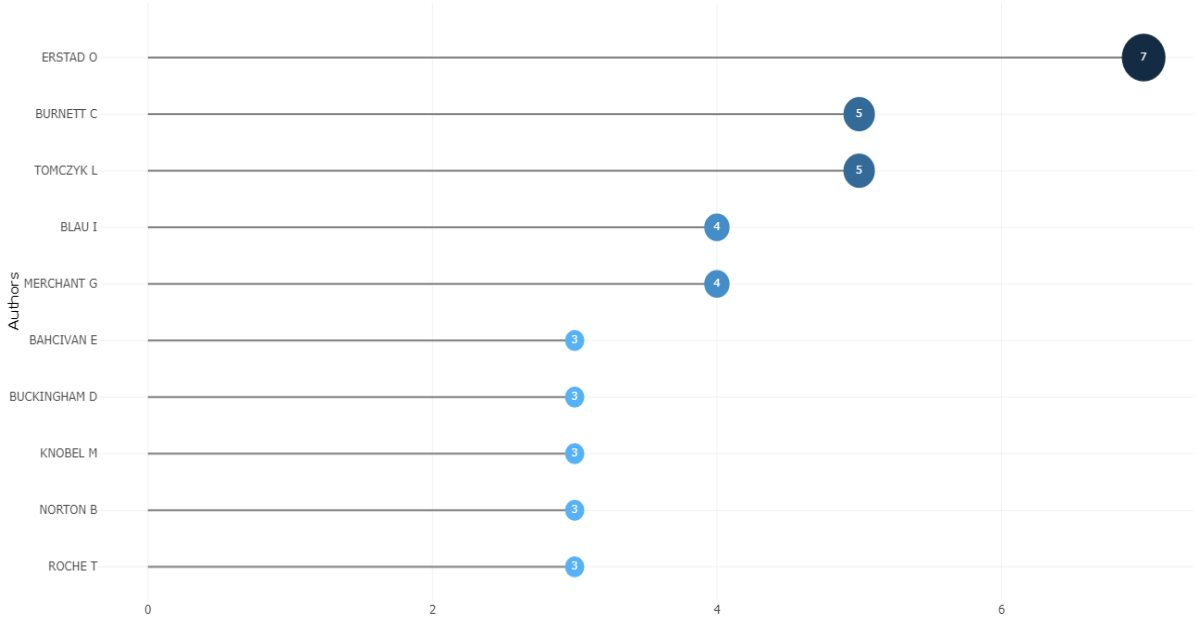


Graph. 5. Most Cited Local Sources

In Graph. 5, the journal "Computers & Education" was the journal most cited with regard to education and digital literacy in the WoS database, followed by the "British Journal of Educational Technology" and "Computers in Human Behavior." Important journals in the field are in the first place among the most cited journals. The high number of citations (628) received by the journal "Computers & Education" compared to other journals makes it important in which dimension the subject of education and digital literacy is addressed in this journal.

Top Ten Most Influential Authors in Terms of Publications

This study examined the annual number of publications of the authors and their individual contributions to these publications.



Graph. 6. Most Influential Authors in Terms of Publications

Upon examining the authors with the highest number of publications in Graph. 6, Erstad is in the first place (TP=7), followed by Burnett (TP=5), Tomczyk (TP=5), Blau (4), and Merchant (4). These authors are followed by Bahcıvan, Buckingham, Knobel, Norton, and Roche, with (3) publications each.

Most Relevant Authors

Table 1 contains the contributions of these authors to the studies they published. To determine this, the published articles were analyzed by fractionalized frequency analysis conducted by dividing them by the number of authors in each article, as specified by (Aria et al., 2020).

Table. 1. Most Relevant Authors

Authors	Articles	AF
Erstad O	7	4.58
Burnett C	5	4.14
Tomczyk L	5	3.25
Blau I	4	1.50
Merchant G	4	2.83
Bahcıvan E	3	1.33
Buckıngham D	3	3.00
Knobel M	3	1.50
Norton B	3	1.33
Roche T	3	2.00

Note: A: Articles, AF: Articles Fractionalized.

Upon examining the data obtained from the analysis, Erstad (AF=4.58) is the most relevant author, followed by Burnett (AF=4.14), Tomczyk (AF=3.25), Buckingham (3.00), Merchant (AF=2.83), Roche (2.00), Blau (1.50), Knobel (1.50), Bahcıvan (1.33), and Norton (1.33).

Top Ten Most Cited Publications

Table 2 contains the most cited publications on digital literacy and education according to the WoS database and the average citations per year.

Table 2. Top Ten Most Cited Publications

Authors_-Year- Sources	PT	TC	TCPY
N G W, 2012, Comput Educ	Can we teach digital natives digital literacy?	271	24.64
Gros B, 2007, J Res Technol Educ	Digital Games in Education *The Design of Games-Based Learning Environments*	235	14.69
Voogt J, 2013, J Comput Assist Lear	Challenges to learning and schooling in the digital networked world of the 21st century	161	16.10
Martın Ag, 2012, Comunicar	Media education, media literacy and digital competence	152	13.82
Sheremet Mk, 2019, Inf Technol Learn To	The Development Level of Smart Informatıon Criterion for Specialists' Readiness for Inclusion Implementation in Education	150	37.50
Ilomaki L, 2016, Educ Inf Technol	Digital competence – an emergent boundary concept for policy and educational research	142	20.29
Buckingham D, 2007, Res Comp Int Educ	Digital Media Literacies: Rethinking Media Education in the Age of the Internet	133	8.31
Buchanan T, 2013, J Comput High Educ	Factors affecting faculty use of learning technologies: implications for models of technology adoption	126	12.60
Prior Dd, 2016, Internet High Educ	Attitude, digital literacy and self efficacy: Flow-on effects for online learning behavior	113	16.14
Greene Ja, 2014, Comput Educ	Measuring critical components of digital literacy and their relationships with learning	105	11.67

PT= Publication Title, TC= Total Citations, TCPY = Total Citations Per Year

The study published by Wang (2012) in the journal "Computer & Education" ranks first with a total of 271 citations and the average number of citations per year of 24.64. The second most cited publication is the study by Gros (2007) with a total of 235 citations and the average number of citations per year of 14.69. Considering the content of the studies, whereas the study by Wang N. G (2012) addressed the education and teaching of students using digital media tools, Gros (2007) focused on improving students' digital literacy through digital games and transferring the literacy developed based on this learning to the education and teaching process. In both studies, discussing the conceptual framework of digital literacy in detail and evaluating digital literacy with the dimension of educational activities come to the fore as the points to be emphasized.

Considering the publications of other authors and the citations they received, the study by Voogt (2013) received a total of 161 citations and the average number of citations per year of 16.10, the study by Martın (2012) received a total of 152 citations and the average number of citations per year of 13.82, the study by Sheremet (2019) received a total of 150 citations and the average number of citations per year of 37.50, the study by Ilomaki (2016) received a total of 142 citations and the average number of citations per year of 20.29, the study by Buckingham (2007) received a total of 133 citations and the average number of citations per year of 8.31, the study by Buchanan (2013) received a total of 126 citations and the average number of citations per year of 12.60, the study by Prior (2016) received a total of 113 citations and the average number of citations per year of 16.14, and the study by Greene (2014) received a total of 105 citations and the average number of citations per year of 11.67.

Thematic Evolution

Important data on the transformation of themes in the process were acquired under the heading of thematic evolution on the relationship between digital literacy and education. While some themes remained

the same in the transformation experienced, it can be indicated that new themes emerged as a result of associating a few themes.

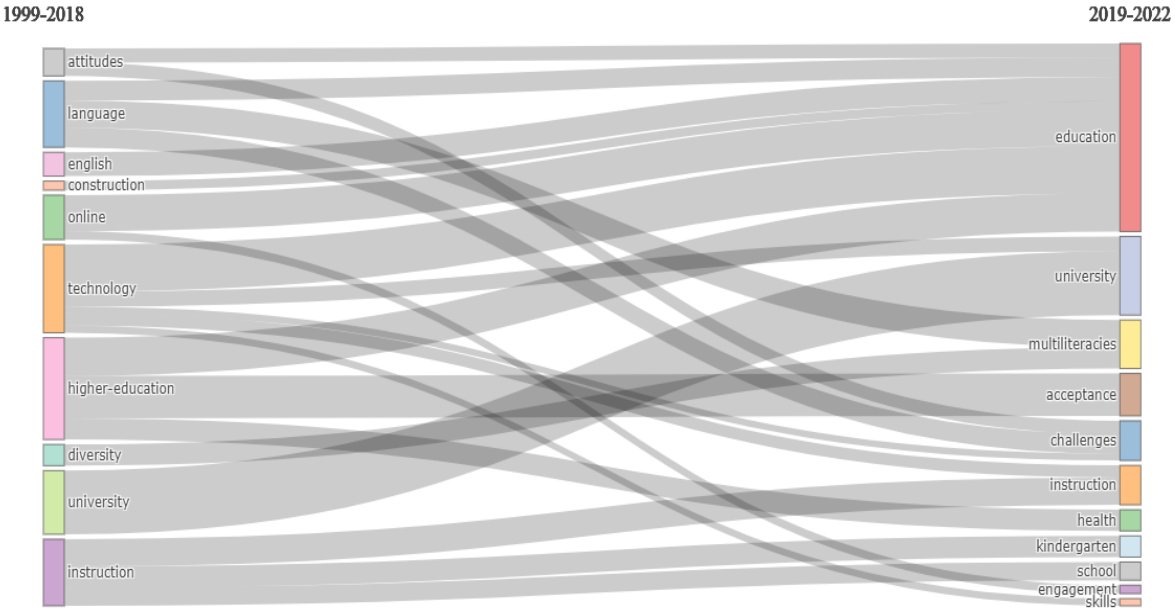


Figure 3. Thematic Evolution

It was revealed that whereas the themes of attitudes, language, construction, online, technology, higher-education, English, diversity, university, and instruction were addressed separately between 1999 and 2018 when the studies were published, these themes were combined under a new theme in the process. For example, the themes of attitudes, language, online, technology, and higher-education were studied under the umbrella of the education theme. A connection was established between the technology and university themes and continued to be studied under the university theme. The themes of language and diversity were combined and studied under the theme of multiliteracy, a new theme. The themes of attitudes, language, and technology were transformed into the challenges theme. It was found that the themes such as technology, higher-education, online, language, and instruction were studied in a few different themes between 2019 and 2022.

Collaboration World Map

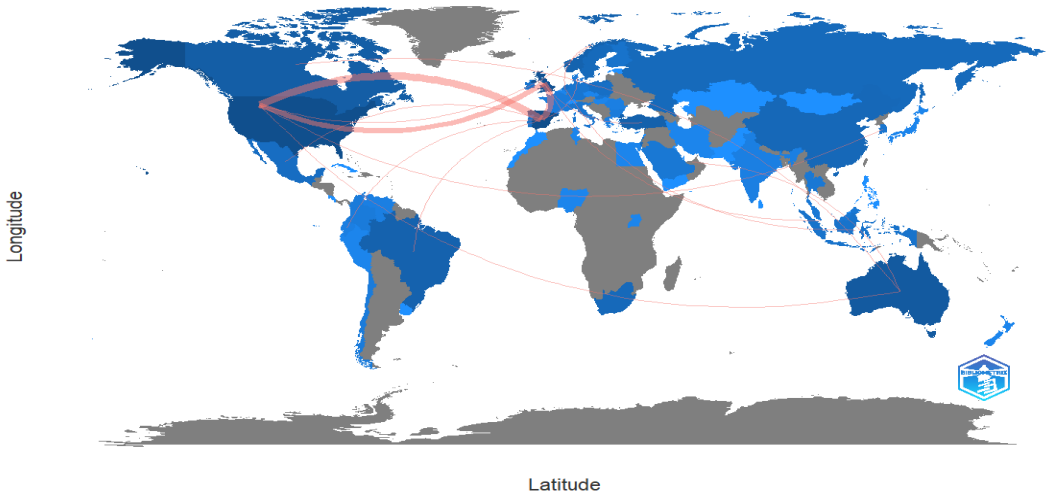


Figure 4. Collaboration World Map

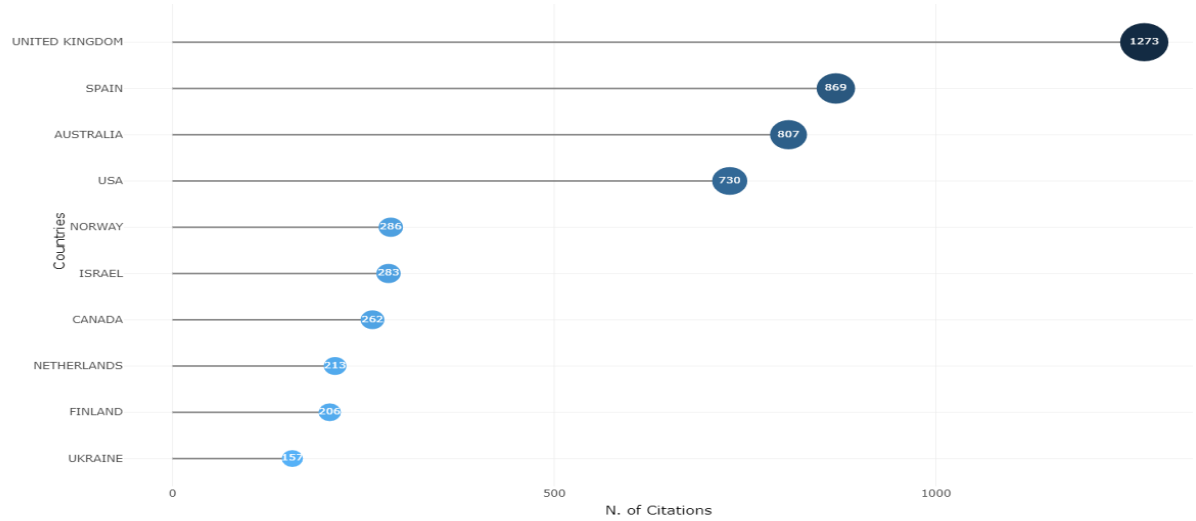
Considering the collaboration between countries in the studies on digital literacy and education at the global level, networks between Spain-USA, USA-United Kingdom, and Spain-United Kingdom emerge.

Collaboration starting from Spain and the USA is observed in a significant part of the studies. Upon examining the countries participating in the collaboration, it can be said that countries, especially on the American and European continents, participate in the collaboration.

Table 4. Collaboration World Frequency

From	To	Frequency
Spain	USA	4
Spain	United Kingdom	3
USA	United Kingdom	3
Australia	Canada	2
Australia	U. Arab Emirates	2
Netherlands	Indonesia	2
Norway	Netherlands	2
Spain	Brazil	2
Spain	Denmark	2
Spain	Ecuador	2
Spain	Mexico	2
United Kingdom	Singapore	2
United Kingdom	Turkey	2
USA	Australia	2
USA	Korea	2
USA	Norway	2

World Dynamics

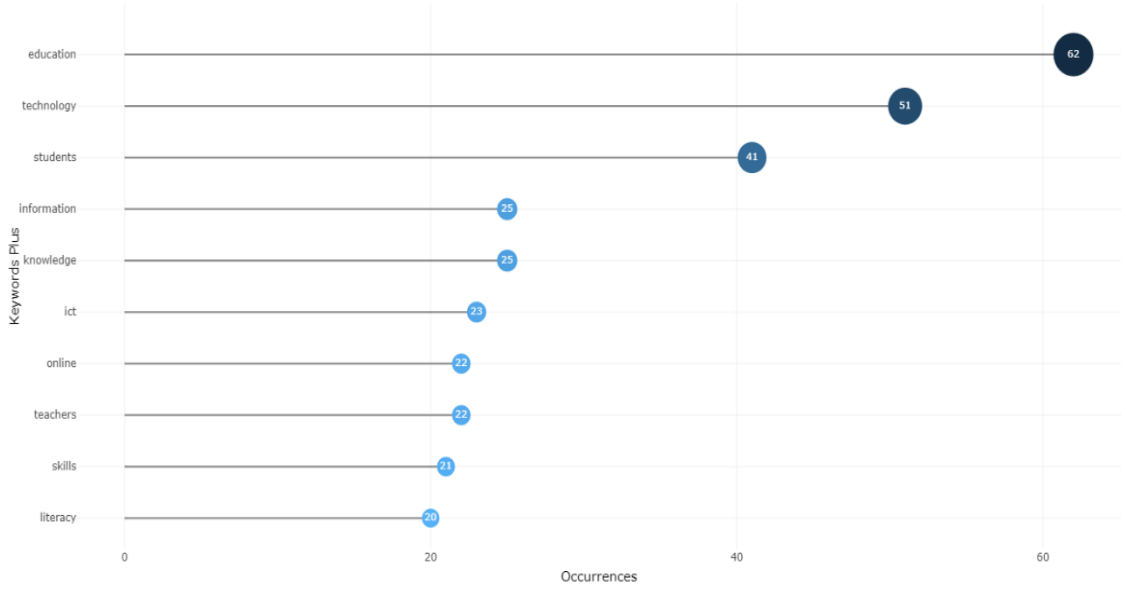


Graph 7. Top Ten Most Cited Countries

While Spain ranks first upon examining the studies within the scope of collaboration between countries, it can be stated the United Kingdom ranks first with a significant number of citing the studies conducted in this country. In this respect, it will be important to examine the studies carried out in the United Kingdom.

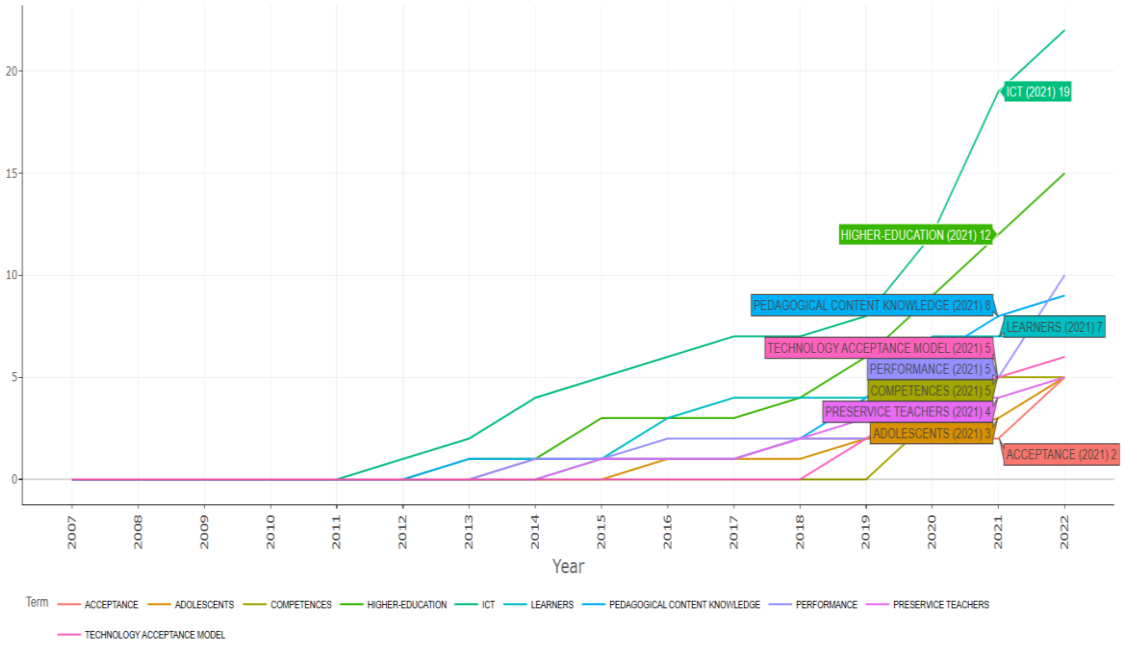
Most Frequent Words

The frequency of the concepts on which the studies are built is among the data standing out in the obtained data and considered important for the research.



Graph 8. Most Frequent Words

Especially the education (f=62), technology (f=51), students (f=41), information (f=25), knowledge (f=25), information and communications technology (f=23), online (f) =22), teachers (f=22), skills (f=21), and literacy (f=20) concepts come to the fore in the research. The fact that the interrelated concepts take the first ten places is valuable in terms of revealing the basic framework of the research. It was regarded as important to evaluate the studies to be performed within the framework of these concepts.

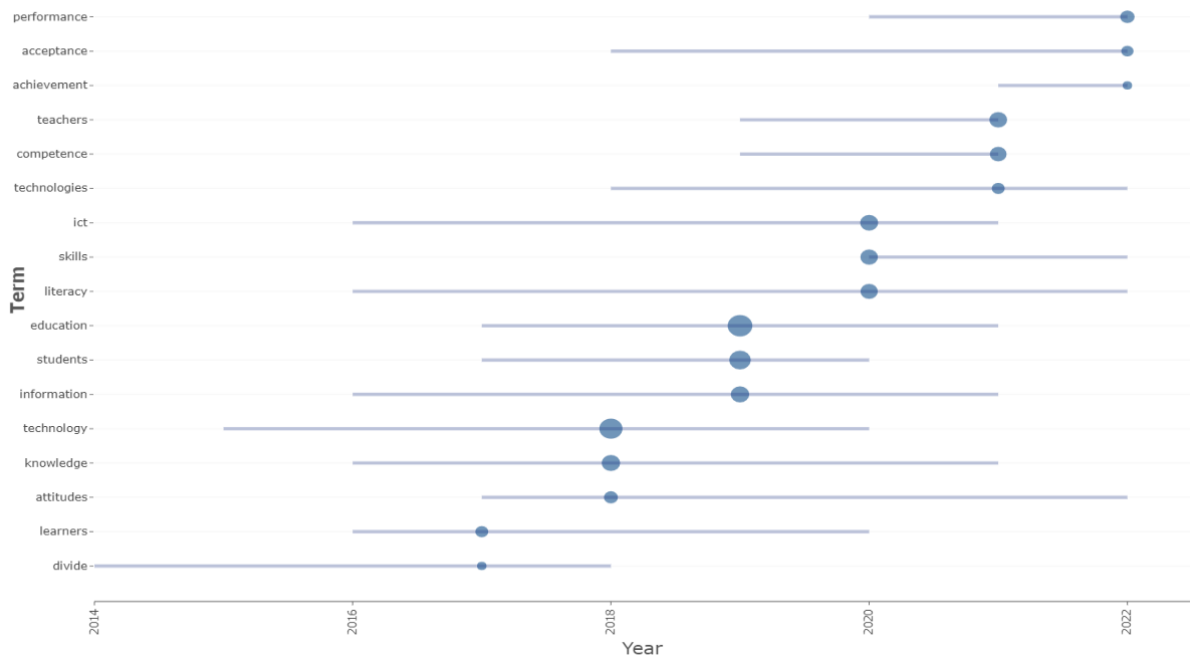


Graph 9. Word Dynamics

In light of the data acquired from the WoS database, it can be said that the usage of ICT (information and communication technology), higher-education, pedagogical content knowledge, and learning concepts has increased significantly.

Trend Topics

An important point to be assessed within the scope of the data acquired is the time when the concepts discussed in the studies come to the fore in the process or are the most popular.



Graph 10. Trend topics of terms

In this context, it was revealed that the concepts of performance, acceptance, and achievement emerged as trend topics by 2022. It can be stressed that the concept of acceptance, which was addressed between 2018 and 2022, came to the fore, especially in terms of the period of study.

Conclusion and Discussion

Within the scope of the findings obtained, there was an increase in the number of research on digital literacy and education since 1999, and the number of citations also increased with the increase in the number of studies as an expected result. It can be said that the number of studies peaked in 2020. However, the number of citations peaked in 2007. Although the peak was in 2007, the number of citations increased in parallel with the number of studies. "Education and Information Technologies" and "Computers & Education" are in the first place among the journals in which studies are published. The journals "Computers & Education" and the "British Journal of Educational Technology" are in the first two places in the citation ranking. In this respect, it is important to examine the studies in the journal "Computers & Education" due to the high number of citations it received. It can be stated that Spain takes the first place in the list of countries where the studies are designed, whereas the USA takes the second place. As important as designing studies is the joint design of studies with the collaboration between countries. Upon reviewing the researchers who designed the studies, Erstad is in the first place. However, concerning the most cited studies, the study by Wang (2012) published in the journal "Computers & Education" comes to the fore. The themes addressed in the studies are the other data as important as the numbers of researchers, journals, and publications. Starting from 1999, when the first studies were revealed, until 2018, the themes of attitudes, language, construction, online, technology, higher-education, English, diversity, university, and instruction were addressed, but it can be said that there was a transformation in the themes as of 2018.

The themes of attitudes, language, online, technology, and higher-education, on which the studies are built, were studied under the umbrella of the education theme. In this regard, it can be indicated that the theme of education comes to the fore as an inclusive theme. It was found that a natural connection was established between the technology and university themes. The themes structured as a result of the research reveal an important indicator of the evolution of the relationship between digital literacy and education. It was determined that the concepts of education, technology, students, and information were studied intensively, as

themes, which are important data demonstrating the relationship between digital literacy and education and its future. It was revealed that the subjects of performance, acceptance, and achievement came to the fore by 2022. In this respect, it is important that an open and strong connection is visible between themes, subjects, and concepts. In light of the findings, it can be observed that the themes, subjects, and concepts on digital literacy and education display a trend. The design and transformation of studies reveal a significant trend regarding digital literacy and education. It is important to reveal a prediction for future research by examining this trend. It should not be overlooked that especially the transformation of themes, subjects, and concepts provides an important perspective. Furthermore, examining the studies of important journals can be a guide in this respect.

Recommendations

- It can be stated that especially the concepts of performance, acceptance, and achievement can be studied in the relationship between digital literacy and education.
- It is recommended to design studies on the themes of attitudes, language, online, technology, and higher-education.
- It is thought that it will be beneficial to examine the studies published in the "Computers & Education" journal while designing the studies.

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