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Is The Perception of Organizational Deviation Affected by The Organizational Climate? Research in Schools*

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ABSTRACT

Purpose: The purpose of the current study was to determine whether organizational deviance perception was affected by organizational climate according to teachers' perceptions.

Research Method: The research was designed in a survey model. In determining the sample of the research, the random sampling technique was used. The sampling of the study was made up of 384 teachers serving in primary and secondary schools in Mugla province in the 2017-2018 school year. To collect the data for the study, Organizational Deviance Scale for Schools and Organizational Climate Scale were used.

Findings: According to the findings of the research, general organizational deviance was at a low level. When general organizational deviance and its dimensions were examined according to the gender of the teachers, a significant difference was observed in favor of the male teachers. Additionally, regression analysis showed that dimensions of organizational climate were separately moderate predictors of the teachers' dimensions of organizational deviance perceptions. At the same time, dimensions of organizational climate were strong predictors of the teachers' organizational deviance perceptions. When the regression coefficient β value was considered, the most important variable for organizational deviance perception and its dimensions separately was the Cooperative Teacher dimension.

Implications for Research and Practice: The increase in the support and cooperation activities among the teachers leads to the improvement of organizational climate and decrease of organizational deviation behaviors in the school. Education administrators are recommended to take necessary measures to increase the support and cooperation among teachers. This study examined negative organizational deviations. It is also suggested that researchers investigate positive organizational deviation.

*This study was partly presented at the 3rd International Symposium on Philosophy, Education, Art and History of Science held at Giresun-Turkey on Oct. 10-13, 2018

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Introduction

Every organization has its existential goals. In order to realize these existential needs, they mobilize all their resources. The organization doesn't want its resources to be used for any other purpose because every organization's first aim is to exist. Organizations turn to other aims after they have ensured their existence. For this, all organizational resources at hand are used to destroy anything which is a threat to its existence. However, research done in the field of administration is revealing new phenomena that pose threats to the organization's existence each passing day. These threats are normally present, however, discovering them is difficult. Organizational deviance behavior is one of these phenomena. No matter how old the roots of this problem might seem, it is just a newly uncovered behavior. Deviance can be seen as the development of an existent or expected phenomenon in a different manner.

Deviance means demonstrating behaviors contrary to what is targeted by the goals specified by societal norms and values and to the institutional means to be followed to achieve them. In other words, it is an explanation of how society organizes people's lives. According to Dolu (2012), deviance is any behavior that goes against societal norms. Yucel (2004), however, saw deviance as related to the behaviors that are against the norms and values of a particular society at a particular period of time. In other words, it can be said that deviance is related to the evaluation of societal norms. These norms are the general value judgments of what is right and wrong in society. These value judgments ensure societal control and are accepted by many as the general control mechanism. As will be understood from Yucel's definition, norms have no universal validation however they are general judgments valid for a specific society at a particular period of time.

Deviation behaviors were also investigated in the organizational environment. Robinson and Bennet (1995) conducted research on what deviation behavior means for organizations, how it occurs, how it emerges, and what the level of deviation is. The organizational deviation is defined as behaviors that are consciously performed by the workers of an organization in such a way as to violate positive organizational rules and threaten human resources possessed by the organization and the well-being of the other resources of the organization (Robinson & Bennet, 2000).

The first study to examine the behavior of organizational deviance in detail was made by Hollinger and Clark (1982, 98). In this study, they asserted that organizational deviance can emerge in two different ways as property and production deviance. The first dimension termed *property deviance* includes behaviors that are dangerous and unproductive to the employer's goods and properties. The second dimension termed *production deviance* comprises behaviors that distract the normal work process. Kose (2013), examples of the first dimension (*property deviance*) behaviors are stealing and engaging in behaviors posing danger to the organization's equipment or their unnecessary use. Deviant behaviors addressed in this dimension are seen as dangerous actions against goods and properties. Examples of the second dimension (*production deviance*) are absenteeism, lack of punctuality, giving long breaks and using substances that adversely affect work performance and deliberately working slowly.

That is, in this model, out-of-norm behaviors directed to the goods and production processes of an organization are listed (Turkkas Anasız, 2016).

Another study in the process of understanding deviant behaviors was made by Vardi and Wiener (1996). The essence of the analysis made in this study was to reveal the causes of deviant behaviors. According to this study behind every deviant behavior lays one or more of three aims. These aims are behaviors exhibited for personal interests, behaviors exhibited to achieve organizational goals and lastly behaviors exhibited with the sole aim of creating negative effects. It is right at this point that deviance surfaces in the scene (Kose, 2013).

The existing research shows that there are deviant behaviors exhibited in schools (Aksu, 2016 ; Argon and Ekinci, 2016; Kose, 2013). Unal (2012), in his study conducted by examining the reports of investigations made by Konya Directorate of National Education, found that out of a total of 131 events, 24 included deviant behaviors. It was also confirmed that the deviant behaviors that happened in schools occurred in two dimensions. These dimensions are behaviors directed at school and behaviors directed at individuals. The same research also confirmed that, of the deviant behaviors exhibited in schools, 25% are directed to students. In a research made by Argon and Ekinci (2016), it was identified that the low level organizational deviant behaviors negatively affect teachers` level of adaptation to the school.

The occurrence of deviant behaviors in a school organization can be tied to so many factors. Among these are organizational factors as well as individual factors. According to Kilicaslan (2007), unjust behaviors can pave the way for deviant behaviors. For example, a teacher who feels victimized due to an unjust behavior from the school principal might be compelled to resort to deviant actions. However, no matter the cause, by paving the way to negativities; deviant behaviors affect teachers who play significant roles in an educational system and also affect the productivity of the school in a negative way.

The organizational climate is an indicator of the social atmosphere that exists in a school. Bursalioglu (1999) expressed that the school climate is just one of the organizational processes. According to Dogan (2017), the school climate is made up of shared reactions or perceptions exhibited by the individuals in the face of an incidence. Organizational climate represents an identity of the organization. In this context, the organizational climate of an organization distinguishes it from other organizations and bestows it with a specific identity, is perceived by the organization's members and affects their lives (Arslan, 2004 & Cekmeceliogu & Keles 2008; Celik, 1997). Uysal (2015) expressed the fact that school climate is affected by so many factors; teachers' perceptions about the general work environment, formal and informal organizational relations, the personality of organizational members and the effects of leadership on them. In this regard, it can be stated that the school climate is formed by the impressions gained by workers through their experiences of various situations in the school environment. Hoy and Miskel (2012) state that school climate is about the quality of the perceptions of teachers serving in the school and their perceptions of the quality of the general atmosphere.

Hoy, Tarter and Kottkamp (1991) have examined the concept of organizational climate in schools and identified four different types of climate. The first of these types is an *open climate*. In this type of school climate, workers' school commitment level is very high. There are cooperation and transparency among workers. The school administrator always supports the workers. According to Can (1997), there are characteristics such as trust, openness in communication, understanding and supportive leadership, employee autonomy and high productivity in this climate type. The second type of climate is the *engaged climate*. In this type of school climate, the principal sees himself/herself above the teachers, he commands and exhibits restrictive behaviors towards teachers. The principal doesn't give prominence to teachers' needs. However, there is strong interaction and cooperation among teachers. The third type is *disengaged climate*. In this type of climate, there is no cooperation and help among teachers. Teachers are not volunteering at taking responsibilities. The school principal, however, exhibits a caring, supportive and constructive attitude. The fourth type of climate is a *closed climate*. In this type of school climate, teachers' commitment level is low. There is low-level support and cooperation among workers. The school principal is a hard supervisor, and always checks on teachers. The workers do not trust each other. According to Can (1997), this climate is a threatening climate. This climate is dominated by the authoritarian leader's overt tendency to obey the chains of command and close supervision.

Hoy, Tarter and Kottkamp (1991) have evaluated school climate on six dimensions; three are concerned with teachers and the other three are related to the school administrator. These dimensions are *Supportive Principal, Directive Principal, Restrictive Principal, Collegial Teacher, Cooperative Teacher and Disengaged Teacher*. In this research, the school climate has been examined within this framework.

School climate and organizational deviant behaviors have generally been addressed as different research topics, or they have been examined in relation to different variables. However, there has not been any research, within the limits of our literature review, that has treated these two variables together. Therefore, the current study is believed to make original contributions to the existing literature. Normally deviant behaviors arise from the problems in a school or they make up the source of existing problems. In this context, this research is designed to determine whether the organizational deviation is affected by the school climate.

Thus, the aim of the current research was to explore the relationship of organizational deviance perceptions and organizational climate at schools. To this end, answers were sought to the following questions:

1. What is the level of organizational deviance perceptions among teachers in schools?
2. What is the level of organizational climate perceptions among teachers in schools?
3. Does the level of organizational deviance perceptions show variations according to gender and place of service of teachers?
4. Does the level of organizational climate perceptions show variations according to gender and place of service of teachers?

5. Are organizational climate dimensions predictive of organizational deviance perceptions?

Method

Research Model

This research was designed in a relational survey model. The relationship between teachers' perception of organizational deviation and the organizational climate was examined. In this context, the research was conducted in the relational survey model. Correlation comparisons are made between variables in relational studies (Gall, Borg & Gall, 2007).

Research Sample

The universe of the research consists of 10400 primary, and secondary school teachers working in the province of Mugla, Turkey. In determining the sample of the research, the random sampling technique was used. At the 95% confidence interval, the size of the sample that could represent the universe was calculated to be 378 participants (Sahin, 2014, p.127). By considering the loss of data and the return rate of questionnaires, 425 teachers were reached. Only 390 of the questionnaires were returned. Among the collected questionnaires only 384 were deemed fit for analyses. Of the teachers who participated in the research, 58,8% were female (n= 224), 41,2'% male (n=157). 79% are serving in district centers (n= 293), and 21% in villages (n=78).

Research Instrument and Procedure

The data collection tool used in the current research is made up of three parts. The first part asked questions concerning participants' demographic information. The second part is the "Organizational Deviance Scale for Schools" developed by Kose and Aksu (2013, p.387). This scale consists of three dimensions (*Individual, Organizational* and *Ethical*) with 20 items. Kose and Aksu (2013, p.387) calculated the Cronbach alpha general reliability of the scale as .93 (RMSEA 0.06, GFI 0.90, AGFI 0.88, RMR 0.05, S-RMR 0.05, and CFI 0.93). In the current research, the general reliability of the scale was calculated to be .89 (Individual .81, Organizational .93 and Ethical .75). The scale 'Organizational Deviance scale for schools' is a 5 Likert type scale with response options; "1-strongly disagree", "2-disagree", "3-undecided", "4-agree" and "5-strongly agree". The scores obtained from the scale are evaluated as (1.00-1.80) "never" (1.81-2.60), "low", (2.61 - 3.40) "moderate" (3.41-4.20) "high" (4.21-5.00) "very high". On this scale, score loading taken from each dimension shows an increasing influence stemming from this dimension on organizational deviance.

In the third part, the "Organizational Climate Scale" developed by Hoy and Tarter (1997) and adapted to Turkish by Yilmaz and Altinkurt (2013) was used. This scale is made up of six dimensions (*Supportive principal, Directive principal, Restrictive principal, Collegial teacher, Cooperative teacher* and *Disengaged teacher*) with 39 items. Yilmaz and Altinkurt (2013, p.7) calculated the Cronbach alpha reliability of the factors and found

that they range from 0.70 to 0.89. In the current research, the reliability of the factors was found to be ranging from 0.75 to 0.92. The scale is a 4-point Likert type scale with response options: "1- rarely occurs", "2- sometimes occurs", "3- often occurs", and "4- very frequently occurs". Score loading from each factor of the scale shows an increasing influence coming from the behaviors in the related factor.

Data Analysis

SPSS 15.0 (statistical package for Social Sciences) statistical package program was used in the analysis of the collected data. The normality test was run on the collected data to determine whether the data exhibit a normal distribution. This test has been performed for both scales and the skewness and kurtosis values found showed that the data were normally distributed for both of the scales. While the Skewness value for the Organizational Deviance scale was found to be ranging from .331 to -.965, Kurtosis was found to be ranging from .509 to .819. Similarly, for the dimensions of the organizational climate scale, while skewness was found to be ranging from -.586 to 658, Kurtosis was found to be ranging from -.689 to .651. According to Tabachnick and Fidell (2013), when these values are between-1.5 and +1.5, they indicate the existence of a normal distribution. In the comparison of descriptions and means, frequencies, medians, t-test were used. Regression analysis was used to determine whether there is any relationship between two variables. In this analysis, Pearson's correlation coefficients obtained were examined. In the interpretation of the correlation coefficient, when it is in the range 1.00 – 0.70, it is considered to be high, in the range 0.69 - .0.30 medium and in the range 0.29 – 0.00 low (Buyukozturk, 2004, p.32).

Results

The purpose of the current study is to determine whether organizational deviance perception is affected by organizational climate according to teachers' perceptions. The relationship between organizational deviance perceptions and school climate was examined. The findings obtained from the data collected to determine this relationship are presented below.

The dimension having the highest mean among organizational deviance dimensions was the *ethical* dimension (x=2.27, Sd=.54). The dimension having the lowest mean was the *individual* dimension (x=2.00, Sd=.85). When general organizational deviance perception levels were examined, the mean was seen to be low (x=2.10, Sd=.61). According to these findings, it can be argued that the organizational deviance perception level is low in schools, with the highest mean in the *ethical* dimension.

The dimension having the highest mean was the Cooperative Teacher dimension (x=2.87, Sd=.59) while the dimension having the lowest mean was the Directive Principal dimension (x=2.23, Sd=.60). According to these findings, the Cooperative Teacher dimension contributes most to the level of organizational climate in schools. The lowest contribution comes from the Directive Principal dimension. T-test findings

for organizational deviance perceptions in schools according to the gender variable are presented in Table 1

Table 1.

T-Test Results for Organizational Deviance Perception Levels According to the Gender Variable

Dimensions	Groups	n	$\bar{x}$	S	sd	t	p*
Individual	Female	224	1.90	.83	379	-2.60	.011
	Male	157	2.12	.839			
Organizational	Female	224	1.91	.809	379	-3.12	.002
	Male	157	2.16	.739			
Ethical	Female	224	2.22	.549	379	-2.13	.034
	Male	157	2.34	.53			
Total	Female	224	2.00	.613	379	-3.17	.002
	Male	157	2.20	.583			

As can be seen in Table 1, the teachers' organizational deviance perceptions in relation to the gender variable were as follows: In the *Individual* dimension, for female (x= 1.90) and for male (x= 2.12); in the *Organizational* dimension, for female (x= 1.91) and for male (x= 2.16); in the *Ethical* dimension, for female (x= 2.22) and for male (x= 2.34), the total organizational deviance for female (x= 2.00) and for male was (x= 2.20).

The teachers' organizational deviance perceptions in relation to the gender variable were as follows: In the *Individual* dimension [$t_{(379)}$= -2.60, $p<0.05$], in the *Organizational* dimension [$t_{(379)}$= -3.12, $p<0.05$], in the *Ethical* dimension [$t_{(379)}$= -2.13, $p<0.05$] and in the total organizational deviance [$t_{(379)}$=-3.17, $p<0.05$]. The organizational deviance and its dimension were found to be varying significantly depending on the gender variable. The significant differences observed were in favor of the male teachers. According to these findings, it can be said that teachers' gender is an effective variable on organizational deviance perceptions in schools.

Organizational deviance perception levels were examined according to the location of the teachers' school. The results of the t-test revealed no significant difference in any of the dimensions. According to these findings, it can be stated that the location of the teachers' schools is not a variable influential on their organizational deviance perception levels. The results of the t-test conducted to determine whether the teachers' organizational climate perception levels vary significantly depending on the gender variable are given in Table 2.

Table 2.

The Results ff t-Test Conducted to Test the Effect of Gender on The Teachers' Organizational Climate Perception Levels

Dimensions	Groups	n	$\bar{x}$	S	sd	t	p*
Supportive principal	Female	224	2.78	.79	379	.78	.437
	Male	157	2.72	.71			
Directive principal	Female	224	2.22	.60	379	-.06	.951
	Male	157	2.23	.60			
Restrictive principal	Female	224	2.41	.60	379	-2.16	.031
	Male	157	2.54	.60			
Collegial teacher	Female	224	2.65	.70	366	2.70	.007
	Male	157	2.48	.58			
Cooperative teacher	Female	224	2.93	.62	369	2.69	.007
	Male	157	2.78	.51			
Disengaged teacher	Female	224	1.86	.68	379	-1.67	.095
	Male	157	1.97	.60			

As can be seen in Table 2, the teachers' organizational climate perceptions depending on gender were as follows; in the *Supportive Principal* dimension, for female (x= 2.78) and for male (x= 2.72); in the *Directive Principal* dimension, for female (x=2.22) and for male (x=2.23); in the *Restrictive Principal* dimension, for female (x= 2.41) and for male (x= 2.54), in the *Collegial Teacher* dimension, for female (x=2.65) and for male (x=2.48); in the *Cooperative Teacher* dimension, for female (x=2.93) and for male (x=2.78), in the *Disengaged Teacher* dimension, for female (x=1.86) and for male (x= 1.97).

The teachers' organizational climate perceptions depending on gender were as follows: in the Supportive *Principal* dimension [$t_{(379)}$= .78, p >0.05]; in the *Directive Principal* dimension [$t_{(379)}$= -.06, p >0.05]; in the *Restrictive Principal* dimension [$t_{(379)}$= -2.16, p<0.05]; in the *Collegial Teacher* dimension [$t_{(366)}$= 2.70, p<0.05]; in the *Cooperative Teacher* dimension [$t_{(369)}$= 2.69, p<0.05]; in the *Disengaged Teacher* dimension [$t_{(379)}$= -1.67, p >0.05]. As can be seen, the teachers' organizational climate perceptions vary significantly depending on gender in the dimensions of *Restrictive Principal*, *Collegial Teacher* and *Cooperative Teacher*. No significant differences were observed in other dimensions. The significant differences observed in the *Collegial Teacher* and *Cooperative Teacher* dimensions were in favor of the female teachers while in the *Restrictive Principal* dimension, it was in favor of the male teachers. According to these findings, it can be stated that the gender of teachers in schools is an effective variable on the level of organizational climate perceptions.

Moreover, the teachers' organizational climate perception levels were analyzed in relation to the location of their schools. The results of t-test conducted revealed significant differences only in three dimensions. These dimensions are; *Supportive Principal* dimension (Center x= 2.68, Village area x= 3.04) [$t_{(369)}$= -3.87, p <0.05], *Collegial*

Teacher dimension (Center x= 2.51, Village area x= 2.82) [$t_{(369)}$= -3.70, p<0.05], *Cooperative Teacher* dimension (Center x= 2.80, Village area x= 3.10) [$t_{(369)}$= -4.10, p<0.05]. In the other dimensions, no significant difference was found. According to these findings, it can be argued that the location of the teachers' schools is a factor influential on the level of organizational climate perceptions.

Regression analysis was conducted to determine whether the teachers' organizational deviance perception levels are predicted by their organizational climate perception levels. The results of the regression analysis run to determine the extent to which the Individual dimension is predicted by the dimensions of organizational climate are given in Table 3.

Table 3.

Results of The Regression Analysis Concerning the Prediction of the Individual Dimension by the Dimensions ff Organizational Climate.

Dimensions	B	Standard error	β	t	p	Zero order r	partial r
Constant	2.84	.323		8.812	.000		
Supportive principal	-.30	.056	-.267	-5.331	.000	-.47	-.27
Directive principal	.03	.059	.019	.453	.651	.07	.02
Restrictive principal	.03	.065	.021	.453	.651	.32	.02
Collegial teacher	.10	.077	.073	1.236	.217	-.32	.06
Cooperative teacher	-.40	.100	-.275	-3.996	.000	-.52	-.20
Disengaged teacher	.39	.063	.296	6.128	.000	.49	.30

R= .63 R^2 = .40 $F_{(6\text{-}377)}$ = 41.400 p=.000

As can be seen in Table 3; there is a negative medium correlation between the *Individual* dimension and the *Supportive Principal* dimension (r=-.47), there is a positive low correlation between the *Individual* dimension and the *Directive Principal* dimension (r=.07), there is a positive medium correlation between the *Individual* dimension and the *Restrictive Principal* dimension (r=.32), there is a negative medium correlation between the *Individual* dimension and the *Collegial Teacher* dimension (r= -.32), there is a negative medium correlation between the *Individual* dimension and the *Cooperative Teacher* dimension (r=-.52) and there is a positive medium correlation between the *Individual* dimension and the *Disengaged Teacher* dimension (r= .49).

However, when the other dimensions are controlled, the partial correlations between these variables, are as follows respectively; *Supportive Principal* (r=-.27), *Directive Principal* (r=.02), *Restrictive Principal* (r=.02), *Collegial Teacher*. (r=.06), *Cooperative Teacher*. (r=-.20) and *Disengaged Teacher* (r=.30).

All the dimensions of the teachers' organizational climate perceptions together yielded a medium and significant correlation with the organizational deviance perception (*individual* dimension) scores (R=.63, R^2 =.40, F= 41.400, p=.000). All the dimensions of the organizational climate perceptions together explained 40% of the total variance of the *individual* dimension.

According to the standardized regression coefficient (β value), the predictor variables' relative order of importance in terms of explaining the teachers' perceptions of the *Individual* dimension was as follows; the *Disengaged Teacher*, the *Cooperative Teacher*, the *Supportive Principal*, the *Collegial Teacher*, the *Restrictive Principal* and the *Directive Principal*.

When the results of the t-test related to the significance of the regression coefficients were examined, it was seen that the organizational climate's dimensions of the *Supportive Principal*, the *Cooperative Teacher* and the *Disengaged Teacher* were significant predictors of the individual dimension of the organizational deviance. No significant difference was found for the other dimensions. According to these findings, the regression equation regarding the predictability of the *individual* dimension is given below:

Individual dimension= 2.84 - (*Supportive Principal* x.30) + (*Directive Principal* x.03) + (*Restrictive Principal* x .03) + (*Collegial Teacher* x.10) - (*Cooperative Teacher* x .40) + (*Disengaged Teacher* x .39).

The results of the regression analysis run to determine the extent to which the organizational deviance (*Organizational* dimension) is predicted by the dimensions of organizational climate are given in Table 4.

Table 4.

Results of the Regression Analysis Concerning the Prediction of the Organizational Dimension by the Dimensions of Organizational Climate.

Dimensions	B	Standard error	β	t	p	Zero order r	Partial r
constant	3.26	.282		11.537	.000		
Supportive principal	-.12	.049	-.114	-2.408	.017	-.40	-.12
Directive principal	-.02	.051	-.018	-.456	.649	.01	-.02
Restrictive principal	-.07	.057	-.057	-1.290	.198	.26	-.07
Collegial teacher	-.01	.068	-.007	-.132	.895	-.41	-.01
Cooperative teacher	-.52	.087	-.386	-5.905	.000	-.60	-.29
Disengaged teacher	.43	.055	.354	7.729	.000	.54	.37

R= .68 R^2 = .46 $F_{(6\text{-}377)}$ = 52.98 p=.000

As can be seen in Table 4; there is a negative medium correlation between the *Organizational* dimension and the *Supportive Principal* dimension (r=-.40), there is a positive low correlation between the *Organizational* dimension and the *Directive Principal* dimension (r=.01), there is a positive low correlation between the *Organizational* dimension and the *Restrictive Principal* dimension (r=.26), there is a negative medium correlation between the *Organizational* dimension and the *Collegial Teacher* dimension (r= -.41), there is a negative medium correlation between the *Organizational* dimension and the *Cooperative Teacher* dimension (r=-.60) and there is a positive medium correlation between the *Organizational* dimension and the *Disengaged Teacher* dimension (r= .54).

However, when the other dimensions are controlled, the partial correlations between these variables are as follows respectively; *Supportive Principal* (r=-.12), *Directive Principal* (r=-.02), *Restrictive Principal* (r=-.07), *Collegial Teacher*. (r=-.01), *Cooperative Teacher* (r=-.29) and *Disengaged Teacher* (r=.37).

All the dimensions of the teachers' organizational climate perceptions together yielded a medium and significant correlation with the organizational deviance perception (*organizational* dimension) scores (R=.68, R^2 =.46, F= 52.98, p=.000). All the dimensions of the organizational climate perceptions together explained nearly 46% of the total variance of the *organizational* dimension.

According to the standardized regression coefficient (β value), the predictor variables' relative order of importance in terms of explaining the teachers' perceptions of the *Organizational* dimension was as follows; the *Cooperative Teacher*, the *Disengaged Teacher*, the *Supportive Principal*, the *Restrictive Principal*, the *Directive Principal* and the *Collegial Teacher*.

When the results of the t-test related to the significance of the regression coefficients were examined, it was seen that the organizational climate's dimensions of the *Supportive Principle*, the *Cooperative Teacher* and the *Disengaged Teacher* dimensions are significant predictors of the *Organizational* dimension of the organizational deviance. No significant difference was found for the other dimensions. According to these findings, the regression equation regarding the predictability of the *Organizational* dimension is given below:

Organizational dimension= 3.26 - (*Supportive Principal* x .12) - (*Directive Principal* x .02) - (*Restrictive Principal* x .07) - (*Collegial Teacher* x. 01) - (*Cooperative Teacher*. x .52) + (*Disengaged Teacher* x .43)

The results of the regression analysis run to determine the extent to which the organizational deviance (*Ethical* dimension) was predicted by the dimensions of organizational climate are given in Table 5.

Table 5.

*Results of the Regression Analysis Concerning the Prediction of the **Ethical** Dimension by The Organizational Climate Dimensions.*

Dimensions	B	Standard error	β	t	p	Zero ordrr r	partial r
Constant	2.48	.231		10.712	.000		
Supportive principal	-.04	.040	-.057	-1.021	.308	-.25	-.05
Directive principal	.04	.042	.047	.998	.319	.08	.05
Restrictive principal	-.04	.046	-.042	-.812	.417	.19	-.04
Collegial teacher	-.04	.055	-.051	-.773	.440	-.28	-.04
Cooperative teacher	-.18	.072	-.191	-2.466	.014	-.40	-.13
Disengaged teacher	.28	.045	.328	6.046	.000	.43	.30

R= .49 R^2 = .24 $F_{(6\text{-}377)}$ = 20.029 p=.000

As can be seen in Table 5, there is a negative low correlation between the *Ethical* dimension and the *Supportive Principal* dimension (r=-.25); there is a positive low correlation between the *Ethical* dimension and the *Directive Principal* dimension (r=.08); there is a positive low correlation between the *Ethical* dimension and the *Restrictive Principal* dimension (r=.19); there is a negative low correlation between the *Ethical* dimension and the *Collegial Teacher* dimension (r= -.28); there is a negative medium correlation between the *Ethical* dimension and the *Cooperative Teacher* dimension (r=-.40) and there is a positive medium correlation between the *Ethical* dimension and the *Disengaged Teacher* dimension.

However, when other dimensions are controlled, the partial correlations between these variables are as follows respectively; *Supportive Principal* (r=-.05), *Directive Principal* (r=.05), *Restrictive Principal* (r=-.04), *Collegial Teacher* (r=-.04), *Cooperative Teacher* (r=-.13)) and *Disengaged Teacher* (r=.30).

All the dimensions of the teachers' organizational climate perceptions together yielded a medium and significant correlation with the organizational deviance perception (*Ethical* dimension) scores (R=.49, R^2 =.24, F= 20.029, p=.000). All the dimensions of the organizational climate perceptions together explained nearly 24% of the total variance of the *Ethical* dimension.

According to the standardized regression coefficient (β value), the predictor variables' relative order of importance in terms of explaining the teachers' perceptions of the *Ethical* dimension is as follows; the *Disengaged Teacher*, the *Cooperative Teacher*, the *Supportive Principal*, The *Collegial Teacher*, the *Directive Principal* and the *Restrictive Principal*.

When the results of the t-test related to the significance of the regression coefficients were examined, it was seen that the organizational climate's dimensions of the *Cooperative Teacher* and *Disengaged Teacher* dimensions are significant predictors of the *Ethical* dimension of the organizational deviance. No significant difference was found for the other dimensions. According to these findings, the regression equation regarding the predictability of the *Ethical* dimension is given below:

Ethical dimension = 2.48 - (*Supportive Principal* x .04) + (*Directive Principal* x .04) - (*Restrictive principal* x .04) - (*Collegial Teacher* x .04) - (*Cooperative Teacher*. x .18) + (*Disengaged Teacher* x .28)

The results of the regression analysis run to determine the extent to which the teachers' organizational deviance perceptions are predicted by the dimensions of the organizational climate are given in Table 6.

Table 6.

Results of the Regression Analysis Concerning the Prediction of the Organizational Deviance by the Organizational Climate Dimensions.

Dimensions	B	Standard error	Beta	t	p	Zero order r	partial r
Constant	2.86	.207		13.792	.000		
Supportive principal	-.15	.036	-.190	-4.237	.000	-.47	-.21
Directive principal	.02	.038	.015	.400	.690	.06	.02
Restrictive principal	-.03	.042	-.027	-.653	.514	.32	-.03
Collegial teacher	.02	.050	.015	.293	.769	-.40	.02
Cooperative teacher	-.36	.064	-.350	-5.669	.000	-.62	-.28
Disengaged teacher	.36	.041	.387	8.935	.000	.59	.42

R= .72 R^2 = .52 $F_{(6\text{-}377)}$ = 67.143 p=.000

As can be seen in Table 6; there is a negative medium correlation between the organizational deviance and the *Supportive Principal* dimension (r=-.47), there is a positive low correlation between the organizational deviance and the *Directive Principal* dimension (r=.06), there is a positive medium correlation between the organizational deviance and the *Restrictive Principal* dimension (r=.32), there is a negative medium correlation between the organizational deviance and the *Collegial Teacher* dimension (r= -.40), there is a negative medium correlation between the organizational deviance and the *Cooperative Teacher* dimension (r=-.62) and there is a positive medium correlation between the organizational deviance and the *Disengaged Teacher* dimension (r= .59).

However, when other dimensions were controlled, the partial correlations between these variables were as follows respectively; *Supportive Principal* (r=-.21), *Directive Principal* (r=.02), *Restrictive Principal* (r=-.03), *Collegial Teacher* (r=.02), *Cooperative Teacher* (r=-.28)) and *Disengaged Teacher* (r=.42).

All the dimensions of the teachers' organizational climate perceptions together yielded a high and significant correlation with the organizational deviance perception scores (R=.72, R^2 =.52, F= 67.143, p=.000). All the dimensions of the organizational climate perceptions together explained nearly 52% of the total variance of the organizational deviance.

According to the standardized regression coefficient (β value), the predictor variables' relative order of importance in terms of explaining the teachers' perceptions of the organizational deviance is as follows; Disengaged Teacher, *Cooperative Teacher*, *Supportive Principal*, *Restrictive Principal*, *Directive Principal* and *Collegial Teacher*.

When the results of the t-test related to the significance of the regression coefficients were examined, it is seen that the organizational climate's dimensions of the *Supportive Principle*, *Cooperative Teacher* and *Disengaged Teacher* dimensions are significant predictors of the organizational deviance. No significant difference was found for the other dimensions. According to these findings, the regression equation regarding the predictability of the Organizational deviance is given below:

Organizational Deviance = 2.86 - (*Supportive Principal* x .15) + (*Directive Principal* x .02) - (*Restrictive Principal* x .03) + (*Collegial Teacher* x .02) - (*Cooperative Teacher* x .36) + (*Disengaged Teacher* x .36)

Discussion, Conclusion and Recommendations

This research was conducted on teachers working at primary and secondary schools in the province of Mugla. The research aims to examine the relationship between organizational climate and organizational deviance perceptions of teachers at schools. In this context first, the teachers' levels of organizational deviance and organizational climate perceptions were determined. According to the teachers' perceptions, the organizational deviance seems to be low. In studies by Kose (2013) and Aksu (2016), organizational deviance was found to be low as well.

In these three studies, the findings regarding organizational deviance perception levels are similar and it can be stated that the results of these studies support one another. In this context, it is possible to state that the organizational deviance perception of teachers is at a low level.

Organizational deviance perceptions' is found to be low shows that teachers exhibit a few deviant behaviors at school. However, it also proves the existence of deviant behaviors. What is desired in fact is the demonstration of no deviant behavior as the existence of deviant behaviors no matter how few they are means that there are some behaviors harmful to organizational goals. It is a fact that obedience to school

values and norms strengthens communication among teachers and thus influences students' success which is one of the main goals in schools.

According to Robinson and Bennett (1995, p. 556) deviant behaviors pose a threat to the existence of an organization and its members and they arise from deliberate indifference and disobedience to important organizational norms. For this reason, no matter how few, deviant behaviors need to be carefully monitored and managed. According to Demir (2010) individual and group sentiments that give rise to organizational deviance need to be effectively managed. In a research made by Argon and Ekinci (2016) a negative relationship was observed for the organizational deviance levels in schools and teachers' commitment levels. When examined in this context it can be stated that reducing or eradicating deviant behaviors in schools will increase teachers' commitment levels.

In these studies, teachers' organizational deviance was examined according to their gender and in all the dimensions a significant difference was observed. According to this in all the dimensions male teachers' organizational deviance perceptions are at a higher level as compared to those of female teachers. In other words, there are more deviant behaviors exhibited by male teachers when compared to female teachers. However, in research done by Kose (2013), no significant difference was observed.

Organizational climate perceptions were examined according to the gender of teachers and a significant difference was found in the dimensions of *Collegial Teacher* and *Cooperative Teacher* in favor of female teachers and in the dimension of *Restrictive Principal* in favor of male teachers. No significant difference was observed in the other dimensions. In a research made by Colak and Altinkurt (2017) in relation to teachers' views about school climate, it was only in the *Disengaged Teacher* dimension that a significant difference was observed in favor of male teachers. In the research made in Turkey, generally, no significant difference is observed regarding organizational climate according to gender (Canli, 2016; Dilbaz Sayin, 2017 & Yildirim, 2017). The fact that different results have been obtained in different studies enforces us to think that it might be a result of the different samples and their characteristics.

The results of the regression analysis to determine how predictive organizational climate dimensions are on organizational deviance showed a moderate level relationship between two variables.

When the correlation is examined for organizational deviance perceptions, it is seen that all the dimensions of the organizational deviance perceptions have a negative medium correlation with the *Supportive Principle*, the *Collegial Teacher* and the *Cooperative Teacher* dimensions. In other words, in relation to these three dimensions of organizational climate, when there is an increase in their level of perception, there is a decrease in their level of organizational deviance perception. This is also an expected result because these three dimensions are the positive dimensions of organizational climate. These dimensions are expected to be negatively correlated with negative behaviors like deviant behaviors. Moreover, all the dimensions of the organizational deviance perceptions, both separately and as a whole, are in a positive low correlation with the *Directive Principal*, *Restrictive Principal* and *Disengaged Teacher*

dimensions. In other words, in relation to these three dimensions of organizational climate, when there is an increase in their level of perception, there is an increase in the level of organizational deviance perception. This is also an expected result because these three dimensions are the negative dimensions of organizational climate. Thus, they are expected to be positively correlated with deviant behaviors.

All the dimensions of the organizational climate together moderately predict the teachers' organizational deviance dimensions (*Individual*, *Organizational*, and *Ethical*). At the same time, it is generally highly predictive of the level of organizational deviance perceptions. This finding shows there is a high-level relationship between the two variables (organizational climate and organizational deviance) This finding shows that when school climate is negatively affected or influenced there is a corresponding increase in organizational deviance perceptions. Similarly, when the school climate is positively affected or influenced there is a corresponding decrease in organizational deviance perceptions.

Standardized regression coefficients (β value) show the relative order of importance of the predictor variables' effect on the predicted variable. When this order is examined the most important dimension that effected the organizational deviance and its dimensions is the *Cooperative Teacher* dimension. This finding shows that the most important dimension is the *Cooperative Teacher* dimension. In other words, *Cooperative Teacher* behaviors have a stronger influence on the organizational deviance when compare to the other five dimensions behaviors. This situation can also be observed from the multiplier of the *Cooperative Teacher* dimension in the regression formulas.

In the current study, it was found that the organizational climate in schools predicts the perception of organizational deviation. When the negative relationship between the two variables is considered, it can be stated that improving the organizational climate in the school will cause a decrease in organizational deviation behaviors. Especially the increase in the cooperation between teachers will lead to improving the organizational climate of the school and a decrease in the organizational deviant behaviors in the school. Therefore, there is great benefit in providing the necessary environment and motivation to enhance collaborative behaviors among teachers. When we look at the items in the factor of *Cooperative Teacher*, it can be stated that it will be useful to carry out activities that improve the attitudes and behaviors of tolerance and cooperation between teachers.

The current study was limited to the city of Mugla. In order to generalize the results to wider universes, similar studies can be conducted in other provinces in the future. On the other hand, only negative deviation behaviors were investigated in this study. Future research may examine positive deviation behaviors. By this way, it may be possible to compare the results or to look at both aspects of the deviation behavior.

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Örgütsel Sapma Algısı Örgütsel İklimden Etkilenir mi? Okullarda Yapılmış Bir Araştırma

Atıf:

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Özet

Problem Durumu: Örgütsel sapma, örgüt çalışanlarının olumlu örgüt kurallarını bozarak, örgütün insan kaynakları ve diğer sahip olduğu kaynakları tehdit eden bilinçli bir şekilde yapılan davranışlardır. Yapılan araştırmalar okullarda da örgütsel sapma davranışlarının yaşandığını göstermektedir. Okullarda meydana gelen bu sapma davranışlarının iki boyutta meydana geldiği saptamıştır. Bu boyutlar okula yönelik davranışlar ve kişilere yönelik davranışlardır. Araştırmalar, meydana gelen sapma davranışların % 25'inin öğrencilere yönelik olduğunu ortaya koymuştur. Bu araştırmada, okullarda meydana gelen düşük düzeydeki örgütsel sapma davranışlarının öğretmenlerin okulu benimseme düzeyini olumsuz yönde etkilediği saptanmıştır.

Bu araştırmanın ikinci değişkeni olan örgüt iklim ise, örgütte var olan sosyal atmosferin bir göstergesidir. Örgütsel iklim, bireylerin bir durum karsısında gösterdikleri ortak tepki ya da algılardan meydana gelmektedir. Araştırmalar, okul

ikliminin birçok faktörden etkilendiğini; öğretmenlerin okulun genel çalışma çevresiyle ilgili algıları, formal ve informal örgüt, örgüt üyelerinin kişilikleri ve bunu etkileyen örgütsel liderlik gibi birçok faktör tarafından şekillendiğini ifade etmektedir. Bu bağlamda okul iklimi okulda görev yapmakta olan çalışanların okul ortamında yaşadıkları durumlardan dolayı edindikleri izlenim ve algı sayesinde oluştuğu açıktır. Başka bir ifadeyle okulda yaşanan sapma davranışları gibi olumsuzlukların okul iklimi ile ilişkili olduğu düşünülebilir. Bu çalışma bu hipotezden hareketle yapılmıştır.

Araştırmanın Amacı: Bu çalışma, okullardaki örgütsel sapma algısının örgütsel iklim değişkeni tarafından yordanıp yordanmadığını belirlemeyi amaçlamıştır.

Araştırmanın Yöntem: Bu araştırma tarama modelinde desenlenmiştir. Araştırmanın evreni, Muğla ilinde bulunan okullarda görev yapan 10400 öğretmen oluşturmaktadır. Örneklemin belirlenmesinde oransız küme örneklemesi tekniği kullanılmıştır. Evreni temsil edecek örneklem %95 güven düzeyi için en düşük 378 olarak belirlenmişti. Veri kaybı düşünülerek 425 öğretmen ulaşılmış ancak toplanan ölçeklerden 384 ölçek değerlendirme için uygun görülmüştür. Araştırmaya katılan öğretmenlerin %58,8'ü kadın (n= 224), %41,2'si erkektir (n=157).

Kullanılan ölçme aracı üç bölümden oluşmaktadır. Birinci bölümde katılımcıların demografik bilgileri sorulmuştur. İkinci bölümde, Köse ve Aksu (2013) tarafından geliştirilen "Okullar İçin Örgütsel Sapma Ölçeği" kullanılmıştır. Bu ölçek 3 boyut ve 20 maddeden oluşmaktadır. Üçüncü bölümde ise Hoy ve Tarter (1997) tarafından geliştirilen ve Yılmaz ve Altınkurt (2013) tarafından Türkçeye uyarlanan "Örgütsel İklim Ölçeği" kullanılmıştır. Bu ölçek 6 boyut ve 39 maddeden oluşmaktadır.

Araştırmanın Bulguları: Bu araştırma ile okullarda öğretmenlerin örgütsel sapma algısının örgütsel iklim değişkeni tarafından yordama düzeyini incelenmektedir. Bulgular okullardaki örgütsel sapma algısının genel olarak düşük düzeyde ($\bar{x}$=2.10) olduğunu ve en çok *Etik* boyutta gerçekleştiği göstermiştir. Yapılan regresyon analizi ile okullarda görev yapan öğretmenlerin örgütsel sapma algı düzelerinin örgütsel iklim düzeyi tarafından yordanıp yordanmadığı incelenmiştir. Bu analizde örgütsel sapma ile; Destekleyici Müdür boyutu arasında negatif orta düzeyde (r=-.47), Emredici Müdür boyutu ile pozitif orta düzeyde (r=.06), Kısıtlayıcı Müdür boyutu ile pozitif orta düzeyde (r=.32), Samimi Öğrt. boyutu ile negatif orta düzeyde (r= -.40), İşbirlikçi Öğrt. boyutu ile negatif orta düzeyde (r=-.62) ve Umursamaz Öğrt. boyutu ile pozitif orta düzeyde (r= .59) bir ilişkinin olduğunu görülmüştür. Ayrıca örgütsel iklimin tüm boyutları birlikte öğretmenlerin örgütsel sapma puanları ile yüksek düzeyde ve anlamlı bir ilişki vermektedir. Örgütsel iklimin tüm boyutları birlikte örgütsel sapma algısının toplam varyansının yaklaşık % 52'isini açıklamaktadır.

Regresyon katsayılarının anlamlılığına ilişkin t-testi sonuçları incelendiğinde Örgütsel iklim boyutlarından Destekleyici Md., İşbrikçi öğrt ve Umursamaz Öğrt. boyutları örgütsel sapma üzerinde anlamlı bir yordayıcı olduğu görülmektedir. Diğer boyutlarda anlamlılık saptanmamıştır. Elde edilen bulgulara göre genel olarak örgütsel sapmanın yordanmasına ilişkin regresyon eşitliği aşağıda verilmiştir:

Örgütsel Sapma = 2.86 - (Destekleyici Müdür x .15) + (Emredici Müdür x .02) - (Kısıtlayıcı Müdür x .03) + (Samimi Öğrt. x .02) - (İşbirlikçi Öğrt. x .36) + (Umursamaz Öğrt. x .36)

Araştırmanın Sonuçları ve Öneriler: Bu araştırmada örgütsel sapma düzeyinin düşük düzeyde olduğu saptanmıştır. Bu durum her nekadar okullarda görev yapan öğretmenlerin sapma davranışlarına dair algılarının düşük düzeyde olduğunu göstermiş olsa da aslında bu davranışların varlığını da göstermektedir. Bu bağlamda düşünüldüğünde, okul ortamlarında örgütsel sapma davranışlarının düşük değil hiç bulunmaması arzu edilmektedir. Çünkü sapma davranışlarının varlığı okullarda düşük düzeyde de olsa örgüt amaçlarına zarar verici davranışların bulunduğunu göstermektedir. Tüm çalışanların örgütsel değerlere ve normlara uyması okul içinde öğretmenler arasında iletişimi güçlendirdiği gibi okulun amacı olan öğrenci başarısını etkileyeceği saklanamaz bir gerçektir.

Örgütsel sapma algısının örgütsel iklim alt boyutları tarafından yordanmasına ilişkin regresyon analizi sonuçları iki değişken arasındaki ilişkinin genel olarak orta düzeyde olduğunu göstermektedir.

Buna göre, korelasyon katsayıları incelendiğinde, örgütsel sapma algısının tüm boyutları ayrı ayrı ve tümü birlikte Destekleyici Müdür, Samimi Öğrt ve İşbirlikçi Öğrt. boyutları ile orta düzeyde negatif ilişki içerisindedir. Başka bir ifadeyle örgütsel iklim değişkenine ait bu üç alt boyutta algı düzeyi yükseldikçe örgütsel sapma algı düzeyi düşmektedir. Bu da beklenen bir sonuçtur. Çünkü bu üç boyut örgütsel iklimin pozitif boyutlarıdır. Sapma davranışı gibi negatif bir davranış tipi ile negatif bir ilişki içinde olması beklenir ve olumlu bir sonuçtur. Ayrıca örgütsel sapma algısının tüm boyutları ayrı ayrı ve tümü birlikte Emredici Md., Kısıtlayıcı Müdür ve Umursamaz Öğrt. boyutları ile düşük düzeyde pozitif ilişki içerisindedir. Başka bir ifadeyle örgütsel iklim değişkenine ait bu üç alt boyutta algı düzeyi yükseldikçe örgütsel sapma algı düzeyi de yükselmektedir. Bu da beklenen bir sonuçtur. Çünkü bu üç boyut örgütsel iklimin negatif boyutlarıdır. Sapma davranışı gibi negatif bir davranış tipi ile pozitif bir ilişki içinde olması beklenir ve olumlu bir sonuçtur.

Örgütsel iklim alt boyutları tümü birlikte öğretmenlerin örgütsel sapma alt boyutlarını ayrı ayrı (Bireysel, Ögütsel ve Etik boyutlarını) orta düzeye yordamaktadır. Aynı zamanda genel olarak örgütsel sapma algı düzeyini de yüksek düzeyde yordamaktadır. Bu bulgu iki değişken arasında yüksek düzeyde bir ilişkinin olduğunu göstermektedir. Bu ilişkiye göre okulda bulunan örgütsel iklim algısı olumsuz etkilendiğinde örgütsel sapma algısının yükseldiği göstermektedir. Benzer şekilde okulda bulunan örgütsel iklim algısı olumlu etkilendiğinde örgütsel sapma algısının düştüğünü göstermektedir.

Bu araştırmada, okullarda örgütsel iklimin örgütsel sapma algısını yordadığı görülmektedir. İki değişken arasındaki negatif ilişki göz önüne alındığında, okuldaki örgütsel iklimin iyileştirilmesinin örgütsel sapma davranışlarında bir azalmaya neden olacağı söylenebilir. Özellikle öğretmenler arasındaki işbirliğinin artması, okulun örgütsel ikliminin iyileştirilmesine ve okuldaki örgütsel sapkın davranışların azalmasına yol açacaktır. Bu nedenle, öğretmenler arasında işbirlikçi davranışları

geliştirmek için gerekli ortamı ve motivasyonu sağlamada büyük fayda vardır. İşbirlikçi Öğretmen boyutunun maddelerine baktığımızda, öğretmenler arasındaki hoşgörü ve işbirliğinin tutum ve davranışlarını geliştiren faaliyetlerde bulunmanın yararlı olacağı söylenebilir.

Bu araştırma sadece Muğla ilinde yapılmıştır. sonuçların daha geniş evrenlere yaygınlaştırılabilmesi için gelecekte benzer araştırmalar diğer illerde yapılabilir. Öte yandan yapılan bu araştırmada sadece olumsuz sapma davranışları incelenmiştir. Gelecek araştırmalar olumlu sapma davranışılarını inceleyebilir. Bu sayede sonuçların karşılaştırılması ya da sapma davranışlarının her iki yönüne de bakılması mümkün olabilecektir.

Anahtar Sözcükler: Örgütsel sapma, öğretmen işbirliği, okul iklimi.

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The Development of Moral and Social Judgments: Social Contexts and Processes of Coordination

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ABSTRACT

The research presented in this essay is grounded in Social Domain Theory. Research provides substantial evidence that children's social development is characterized by the formation of distinctly different systems of thought, including those in the moral, social-conventional, and personal domains. A main focus here is on morality, defined as involving understandings of welfare, justice, and rights, which are applied across societal contexts. Social conventions are uniformities within social systems, serving to provide uniform expectations. The domains constitute different configurations of thinking and developmental changes occur within each domain. However, decisions in social situational contexts often involve coordination, which is a process of weighing and balancing different and sometimes conflicting considerations. Such social contexts can include conflicts between different moral goals or between moral and societal goals. Processes of coordination are examined in social psychological experiments, as well as developmental studies of topics like honesty, rights, and social inclusion. Coordination is also considered in people's perspectives on cultural practices of unfairness and inequality. Psychological research in patriarchal societies shows that females, who are subjected to inequalities evaluate those cultural practices as unfair. Anthropological research documents that females engage in acts of opposition and moral resistance regarding perceived unfair cultural practices.

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Introduction

In this paper, we focus on what we refer to as processes of coordination in moral and social decisions. Briefly put, coordination involves the weighing and balancing of different considerations and goals in coming to decisions in social situational contexts. Social situations can be multifaceted and thereby call for processes of coordination in at least two respects. One is that social situations can include conflicts between more than one moral goal or between moral and non-moral goals. A second is that different socially defined contexts can require that the perspective on a moral goal is partially defined by the commitments of those participating in the activity. An example of the latter type – which we discuss below – would be game or sport contexts. Our analyses are grounded in a theoretical framework and associated research labeled social domain theory (Turiel, 1983a, 1983b, 2002). Researchers in this tradition have focused on the development of moral and social reasoning. First, we contrast the domain approach with other approaches to moral development. Then we review some of the parameters of domain theory, along with supporting research evidence, before considering processes of coordination in social contexts.

Theoretical Approaches to Moral and Social Development

The research based on social domain theory has examined the development of moral and social thinking from early childhood to adulthood. The emphasis on thought and reasoning in the moral and social realms is associated with explanations of development as entailing constructions through individuals' interactions with the social world. The moral understandings constructed by individuals involve concerns with people's welfare, justice or fairness, and rights – concerns found across cultural settings. Such a way of defining morality and its development contrasts with other psychological approaches, originated in behaviorist (Skinner, 1971) and psychoanalytic (Freud, 1930) theories that emphasized the learning of societal or cultural values, as well as those that emphasized biological sources (Greene, Sommerville, Nystrom, Darley, & Cohen, 2001).

Environmental approaches. Behaviorists of the early and middle parts of the twentieth century proposed that morality is the acquisition of environmentally determined valued behaviors through mechanisms of positive and negative reinforcement. Early in the twentieth century, psychoanalytic theorists proposed that societal moral values are learned by children through the acquisition of a mental faculty – the superego – that included adherence to societal values through mechanisms such as feelings of guilt. In contrast to the behaviorist explanations, psychoanalytic ones included the idea that the process of acquiring moral values involves a great deal of conflict for children. The conflict was seen to stem from the societal requirement that children suppress strong needs and instincts.

In contemporary times, these views of the development of morality as the incorporation of values or standards defined by the environment have been extended in social learning or socialization perspectives and in what is referred to as cultural

psychology. Social learning theorists propose that in addition to the effects of rewards and punishments children learn by imitating others (Bandura, 1991). It has also been proposed that the effectiveness of the transmittal of moral values is influenced by the types of child-rearing practices used by parents (Baumrind, 1989).

In contrast, cultural psychologists propose that individuals come to adopt and identify with general socio-moral orientations of their culture, on the assumption that most cultures can be characterized as individualistic or collectivistic (Markus & Kitiyama, 1991; Shweder & Bourne, 1982; Shweder, Mahapatra, & Miller, 1987; Shweder, Much, Mahapatra, & Park,1997; Triandis, 1996). Cultural psychologists propose that cultures have cohesive and integrated moral and social orientations. Those with an individualistic orientation, usually found in Western societies, give most importance to personal choices and decisions. In those cultures, emphasis is placed on freedom of choice and independence, and morality is primarily based on the notion of rights. In cultures with a collectivistic orientation, usually found in non-Western societies, most importance is given to the group and to interdependence among people. Within this orientation, social hierarchies are central, and people readily accept their roles as stipulated by societal systems. Morality is primarily based on adhering to duties and rules.

Biological approaches. As noted, there are psychological approaches that emphasize the role of biology or genetics in morality. In recent times, researchers taking a biological perspective have conducted studies associated with neuroscience using neuroimaging methods (e.g., Cushman, Young, & Hauser, 2006; Greene, Sommerville, et al., 2001; Koenigs, Young, et al., 2007) . Typically, participants placed in an fMRI machine are presented with situations depicting a runaway trolley that is going to strike and kill five workmen on the track. In one version, a bystander can throw a switch that would divert the trolley and kill one person but save the lives of five. In another version, a bystander can push a man in front of the trolley, killing that person but saving the lives of five. The usual findings are that most participants judge it acceptable to throw the switch and unacceptable to push the man. The usual interpretations of these findings are that pushing a person to his death evokes much stronger biologically based emotions than throwing a switch, and that, more generally, emotions are primary in such decisions.

There are reasons to question the interpretation of the findings from the trolley car research that decisions are mainly emotionally driven (Dahl, Gingo, Uttich, & Turiel, 2018; Killen & Smetana, 2007; Turiel, 2010). First, both types of situations should be seen as involving strong conflicts for participants, since they are posed with the problem of choosing whose lives to save and whose to sacrifice (see Dahl et al., 2018 and Turiel, 2010 for extensive discussions). Embedded in the trolley car situations are emotionally laden problems with multiple considerations that are difficult to reconcile without violating serious moral precepts in order to achieve serious moral goals: the strongly held value of life must be violated in order to preserve that very value.

The trolley car situations present a compounded problem involving the saving of lives, taking a life, the natural course of events, the responsibility of individuals

altering natural courses, and causing someone's death in a direct way. As shown in research by Dahl et al. (2018), these situations require a coordination of judgments, with those involving the pushing of a man requiring more complex coordination than those involving the throwing of a switch. The research on judgments about the trolley car situations can be informative for the study of decisions in complex moral situations, but such research needs to be grounded on research that examines judgments about situations that are not so complex. An example of such work is the research done on social domains, which includes assessments of judgments about straightforward moral situations.

Development within Social Domains

Many studies have been conducted with children, adolescents, and adults using situations better representative than trolley car situations of the ones people face in their lives. A fundamental premise of the domain research is consistent with prominent philosophical analyses of morality – namely, that it involves reasoning and choice (Dworkin, 1977; Frankena, 1963; Gewirth, 1982; Habermas, 1993; Nussbaum, 1999, 2000; Rawls, 1971, 1993; Sen 1999, 2006, 2009). As put by Nussbaum (1999, p. 71), "human beings are above all reasoning beings, and … the dignity of reason is the primary source of human equality." In turn, Sen (2006, p. xiii) linked reasoning to choice: "Central to leading a human life ... are the responsibilities of choice and reasoning." On the psychological side, the domain research has been influenced by the structural-developmental theories of Piaget (1932, 1947, 1970). In Piaget's perspective, children think about their experiences, including social experiences, and construct ways of thinking about the world around them. In this perspective, therefore, development is not environmentally or biologically determined.

Our research has shown that by an early age (4 or 5 years of age and perhaps earlier, see Smetana, 2018) children form moral judgments about right and wrong, which include understandings of the need to avoid harm and to benefit people. At somewhat later ages children develop increased understandings of justice and rights (Helwig, 1995, 1997; Helwig & Turiel, 2017; Turiel, 1983a, 2002; Turiel & Wainryb, 1998). The types of actions studied that demonstrated children's moral judgments include hitting, stealing, unequal treatment, helping, and sharing.

Stated generally, morality involves understandings of welfare, justice, and rights. Those understandings are associated with positive emotions like sympathy, empathy, and affection (Turiel, in press; Turiel & Killen, 2010). Moral judgments are not contingent on rules or authority, and morality is judged to apply across groups and cultures. As an example, children have been posed with questions like "suppose an authority (e.g., a principal or teacher) in a school stated that it is alright to hit people, would that be alright? Consistently, children responded that it would not be alright – as illustrated in the following response by a five-year-old boy (Turiel, 1983a, p. 62): "No it is not okay…because that is like making other people unhappy. You can hurt them that way. It hurts other people, hurting is not good."

As indicated by the statement of the 5-year-old, children's experiences with these types of events, such as hitting and being hit, are sources of moral development (Turiel & Gingo, 2017). Children's moral judgments are formed through their everyday experiences having to do with harm, benefits to people, fair and unfair treatment, equal and unequal treatment. These types of experiences occur with adults and other children and occur the world over (Piaget, 1932; Turiel & Gingo, 2017). Moreover, children reflect upon their social experiences, as shown by research in which they reported on times they had felt hurt by someone and times they had hurt someone (Wainryb, Brehl, & Matwin, 2005; Wainryb & Recchia, 2005). The following responses illustrate the ways they reflect upon social experiences. First is a response by a 4-year-old boy (Wainryb et al., 2005, p. 55):

I was playing with my friend Adam and I said something that really hurt him and he said, "I don't like that." And I stopped. I also pushed him. And I said, "I'm sorry." Because he told me he didn't like it.

The 4-year-old is aware of his role in causing harm, and of the need to repair it. With age, reflections upon the feelings of others and regrets become more complex as illustrated by the responses of an adolescent female with regard to a time she had made fun of an old friend (Wainryb & Recchia, 2005, p. 18):

I was like thinking about it and I was like, "How could I do that to my former best friend," you know? Cause she was a person too and just cause I wanted to fit in with other people, I shouldn't have done that. So, I like, this went on for a while. And after that I apologized to her and she accepted my apology although, I don't think I would have if someone would have done that to me. I would have been really hurt. And I found out she cried all the time. And that just made me feel really bad that I did that. So ever since then, I don't make fun of people anymore.

In reaction to a perceived moral transgression on her part, this adolescent reflected on the relationship, the reactions of those involved, on how she should have acted, and on how she should act in the future. The responses of the 5-year-old also illustrate how there is a focus on the harm caused and not on rules (or what is dictated by authorities or by common practices). As shown by a good deal of research (see Smetana, 2006 and Turiel, 2015 for summaries), in another domain of social reasoning – the conventional domain – there is a focus on rules, authority, and common practices. The social-conventional domain pertains to those norms or customs that can be particular to social systems, serving to maintain smooth social functioning (Turiel, 1983a). Research has assessed judgments about conventional issues like forms of address, types of dress, table manners, and forms of greeting. It has been found that children do judge conventions to be contingent on rules and authority, and that they can legitimately differ from one setting to another – such as the home, school, or in different cultures. Table 1 provides a summary of the ways the configuration of thinking about moral issues differs from thinking about conventional issues.

Table 1

Features of Thinking in the Moral and Conventional Domains

Morality	Social Conventions
Concepts of welfare, justice, and rights	Concepts of uniformities in social systems
Not contingent on rules, authority, or existing practices	Contingent on rules, authority, existing practices, and agreements
Universally applicable.	Relative to social systems

We should also note that children develop judgments about the domain of personal jurisdiction (Nucci, 1981, 2001). They form judgments about autonomy, independence, and personal choices. These are judgments about aspects of life that are seen as up to individual decision as long as they do not harm others. We should also note that the types of judgments distinguishing the domains cut across ages. Developmental changes occur within each of the domains (Nucci, 2001; Nucci, Turiel, & Roded, 2017; Turiel, 1983a).

The domain distinctions have been found in research conducted in several cultures (Turiel, 2002). Research examining related aspects of domain distinctions has also been conducted with members of different religious groups. The first studies of this type were with children affiliated with the following religions: Amish-Mennonites, Dutch Reform Calvinist Christians, and Conservative Orthodox Jewish (Nucci, 1982; Nucci & Turiel, 1993). In that research, participants made judgments about issues classified in the moral domain (e.g., stealing, hitting, damaging another's property) and issues classified as non-moral practices pertaining to the religions (e.g., day of worship, work on the Sabbath, head coverings, women preaching, women reading from the Torah, interfaith marriage). Participants were posed with questions regarding the alterability of the rule pertaining to each type of act (i.e., can the rule be changed by all the members of the congregation and the Minister/Rabbi), the generalizability of the act (i.e., another religion that does not have a rule about the act), and whether or not the rule was contingent on God's command (i.e., suppose there was nothing in the Bible or God's word about the act). It was found that most participants judged that the moral violations were wrong because of harm, that the rules should not be changed by congregations or authorities, that it would be wrong for other religions not to have the rules, and that the wrongness of the acts was not contingent on the Bible or God's word. For the most part, the conventional religious practices were judged differently from the moral acts. Most judged that other religions could legitimately have different rules about the religious practices. Some did judge that the religious authorities could change the rules. Others judged that authorities could not change those rules but that they could be changed by God (which contrasts with the finding that the moral rules were not contingent on God's word).

Corresponding findings have been obtained in studies with other religious groups. Srinivasan, Kaplan and Dahl (in press) studied judgments about moral and religious practices among Hindu and Muslim children in India. Robinson and Smetana (2019) studied judgments about moral rules and gender-based rules and practices among Mormon adults in the United States. In each case, distinctions were made in thinking about moral and conventional religious norms.

Judgments Regarding Circumscribed Social Contexts

In the studies that included assessments of judgments about religious practices, it was found that children and adolescents understand the role of authorities and rules within the constituted social systems. It also was found that while religious rules, authorities, and cultural practices were important to the religious social context, they were not accepted as legitimate bases for allowing acts that caused harm to others or were unfair. However, there may be some circumscribed social contexts in which the moral status of acts of physical force or emotional harm can be transformed in people's decisions. Two such contexts are the games and sport activities that people engage in voluntarily and with general agreement.

In one study, assessments were made of children's (6 to 11 years of age) judgments about hypothetical situations depicting a game in which an act could be construed as entailing psychological or emotional harm (Helwig, Hildebrandt, & Turiel, 1995). As presented to the children, the rules of the game included that one child would call another "stupid," who would then be in the role of chasing the first child. Thus, the game was described in ways that the intentions of the players were not to emotionally harm another but to engage in the game in the specified ways accepted by all. It was found that the large majority of the children judged the act of calling someone stupid in that context to be acceptable. Part of the design of the study was to present situations in which the intentions of a player and the reactions of another were varied. For example, in one situation a child intended to inflict emotional harm to another who was unaware of the game rules and who experienced emotional hurt. Large majorities of the participants judged that it was wrong to engage in the act under those circumstances, because not everyone was aware of and accepted the rules and because of the intention to harm. It was also found that large majorities judged it wrong to engage in the act of calling someone stupid outside of the game context.

The Helwig et al. (1995) study included assessments of children's judgments about a game in which the rules permitted a physical act of force with potential harm – pushing others down but without the intention to cause physical harm. None of the children in the study thought it was alright to play such a game because of the risk for harm. However, there are ways some organized sport activities do allow for physical contact of one type or another (American football is an example). There is a body of research on the moral development of individuals who engage in organized team sports (such as members of university teams). In that research it has been proposed that student-athletes, by being closely tied to the social system of sport, tend to accept

physical aggression because they disengage from their moral responsibilities in favor of more ego-centric goals (Bandura, 2016; Boardley & Kavussanu, 2010) or because their moral development is inadequate, lagging behind that of non-athletes (Bredemeier & Shields, 1984, 1986; Shields & Bredemeier, 2001; Stoll & Beller, 1994). The problems with those approaches are that they have relied on assessments of general stages of moral judgment proposed by Kohlberg (1963) and others that fail to account for domain distinctions. The research on domains has shown that children do not progress through such general stages (Turiel, 1983a).

Recent research was designed to consider these features (Banas, 2019). In that study, groups of young adults (undergraduate students from 18 to 25 years of age) with more and less experience in organized sport activities were presented with general questions about inflicting physical harm in and out of sport activities. The participants were also presented with hypothetical situations describing a player in a game who intentionally inflicts physical harm on another player without provocation and with provocation. Similarly, participants were presented with comparable situations outside of sport activities in which a person intentionally inflicts harm to another person without and with provocation. Additional situations depicted the use of physical force as a means of helping to shape another for the rigors of athletic events and in order to make a young person more resilient.

The preliminary findings reveal little in the way of differences in judgments between those who participate in sports and those who do not do so. Intentionally inflicting physical harm not sanctioned by the rules of the sport was judged wrong whether it be provoked or unprovoked. Similar judgments were made of harm outside of sport contexts. This was the case in responses to the general questions and to the hypothetical situations. Some of the findings, therefore, demonstrate that those engaging in athletic activities make moral judgments about acts intended to inflict physical harm in both sport and non-sport contexts that are similar to the moral judgments made by non-athletes. However, other findings show that individuals do take into account social contextual features of sports that involve voluntary participation and general agreement about the function of acts of force. Participants were more likely to accept acts of force in sport contexts (e.g., in a basketball game) than in non-sport contexts when they are part of the rules and generally accepted.

Other preliminary findings from the study bear on another important contribution, the role of understandings of reality or informational assumptions to the process of making moral and social decisions (Asch, 1952; Hatch, 1983; Turiel, Hildebrandt, & Wainryb, 1991; Turiel, Killen, & Helwig, 1987; Turiel & Wainryb, 1994). It appears that a greater number of participants judged that it is alright to use force in order to help train or shape a young person for the rigors of sporting events they intend to pursue. Such decisions take into account understandings of reality that can be factual and that involve beliefs about psychological functioning (informational assumptions can also involve beliefs about biology and the natural world). Beliefs about reality are different from moral concepts but can affect the moral decisions people make. Consider as an example, decisions about parental spanking of a child, which does involve inflicting physical pain (for other examples, see Hatch, 1983, Turiel et al., 1987; Turiel et al., 1991).

It has been found that some adults who generally judge inflicting pain as wrong judge spanking a child for wrongdoing as acceptable on the grounds that it is effective in helping them to learn necessary moral behaviors (Wainryb, 1991). In turn, those who make the psychological assumption that spanking is not effective for moral learning judge it unacceptable. The research also shows that people's evaluations of spanking are correlated with hypothetically presented evidence proving that spanking is either effective or ineffective (e.g. individuals more often say they would judge spanking as wrong if it were proven that spanking is ineffective for learning and development). The judgment that physical force is alright when used with the aim of training for sport activities rests on the psychological-informational assumption that it is effective and necessary in the learning process of becoming a better athlete and does not cause harm that would outweigh the benefits of the training.

Social Situational Contexts and Processes of Coordination

The examples of judgments about non-sport activities show that an act like purposely pushing someone down to the ground can be seen as a straightforward situation, invoking only moral concerns (e.g. pushing is not alright because it is harmful). However, when the act is placed into the context of a game in which the rules allow for pushing and everyone playing the game agrees to it, the situation takes on additional features that are perceived and taken into account. In doing so, individuals weigh and balance — or coordinate —these components and draw priorities in coming to a decision. Many social situations are complex in these ways and include multiple components with competing goals, requiring coordination. Indeed, some situations may involve conflicts between different moral goals. There is a fair amount of research from the domain perspective evidencing that these processes of coordination are involved in social decision-making.

However, before discussing that research we consider a set of classic social psychological experiments on so-called "obedience to authority" (Milgram, 1963, 1974) as a means of illustrating the ways social situations can present people with conflicting considerations and goals. In the experiments, participants were recruited through public postings and advertisements to participate in "scientific study of memory and learning" conducted by Professor Stanley Milgram of Yale University. Those who volunteered to participate were taken to a "laboratory" setting, introduced to the experimenters who wore official looking white coats, and told they would be participating in a study on the effects of punishment in the form of electric shocks on memory and learning. The experimenters made a pretense of choosing between two supposed participants to be the teacher and learner, but the one chosen as the learner was actually a confederate of the experimenters. The "learner" was strapped into a machine that supposedly delivered increasing levels of shock. Then the participant as teacher was instructed to administer the increasing levels of shock (though the learner did not actually get shocked) every time the learner made a mistake in the task.

We have provided all these details in order to convey that the social context of the experiment went beyond the directives of persons in authority and also conveyed that it was a scientific enterprise. In addition, the details reveal the good deal of dishonesty or deception engaged in by the experimenters (more about this below). The oft presented notion that Milgram's research demonstrates that people will obey an authority when commanded to inflict pain and harm to another is inaccurate for two reasons. One is that it does not account for most of the findings in the different experimental conditions in the research (Milgram, 1974). The research actually included a number of different conditions in which there were variations in the closeness of the person being shocked (e.g., the person is in a different room or in the same room) and/or of the roles of the experimenters (e.g., gives instructions from another room or two experimenters give conflicting instructions). In most of those experimental conditions the majority of participants at some point actually refused to do what the experimenters instructed.

In the most publicized condition, the learner was in a separate room, but the participants could hear him yell that the shocks were very painful and that he wanted to stop the experiment. It is only in that condition that the majority (about 65%) of participants did continue giving the shocks to the end of the scale. However, even in that condition participants reactions did not simply reflect obedience to authority. In most cases, there was a great deal of conflict experienced by the participants and they usually expressed concern for the other person and repeatedly asked the experimenter to stop (Turiel, 2015). Their reactions reflected concern with the pain and harm experienced by the other person. At the same time, participants were concerned with the goals of the scientific enterprise conveyed (falsely) to them by the researchers – for which they had agreed to participate. As opposed to the process of obeying an authority, we propose that participants who continued or refused to continue administering the electric shocks were involved in a process of coordination, weighing and balancing concerns with the pain inflicted and achieving the scientific goals of the experiment.

As already stated, decisions in many social situations involve processes of coordination because they include more than one consideration or goal. Indeed, we can see that the researchers in the so-called obedience to authority studies, including Milgram, made decisions involving coordination between their scientific goals and the value of honesty. They made dishonest statements by, in essence, lying to participants in the recruitment announcements and in the experimental settings in order to further their scientific goals. Milgram essentially justified the use of deception on the grounds that it served to further scientific goals. He has stated, "Misinformation is employed in the experiment; illusion is used when necessary in order to set the stage for the revelation of certain difficult to get truths" (Milgram, 1974, p. 198). More generally, the topics of honesty and deception provide interesting instances of processes of coordination in decision-making. In the philosophical, social scientific, and values education literatures honesty often is cited as a seemingly binding moral good. Whereas honesty and trust often are moral goods, there are situations in which they may have lower priority than other moral goods. An illustrative example provided by

philosophers is a hypothetical situation in which an individual has to decide whether or not to tell the truth to a murderer who asks where his intended victim has gone (Bok, 1978). This hypothetical situation poses a conflict between being honest and saving a life. It has been argued that the morally correct response is to lie to the murderer. Often-cited real life examples of such decisions are those who lied to German authorities during World War II regarding the location of Jewish people.

Using situations other than ones involving lives, we have conducted a series of studies on judgments about honesty and deception with adolescents and adults (Gingo, Roded, & Turiel, 2017; Perkins & Turiel, 2007; Turiel & Perkins, 2004). In one study, we examined judgments about deception that took place between an adolescent and a parent or an adolescent and a peer in response to conflicting positions on moral, personal, or prudential (i.e., bearing on one's safety or well-being) actions in which the adolescent was involved. First, we should emphasize that adolescents and adults judge dishonesty to be wrong in the abstract and when it is done for self-serving purposes (Turiel & Gingo, 2017). The procedure in the studies with adolescents was that they were presented with hypothetical situations in which parents or peers direct an adolescent to engage in: acts they consider morally wrong (e.g., engage in racial discrimination, in a fight); acts involving personal choices (e.g., who to date, clubs to join); and prudential acts (e.g., riding a motorcycle, doing homework). In the stories, the adolescent does not do what is directed but lies about it to the parent or peer. The results showed that the adolescent participants varied in their judgments about the acceptability of deception on the basis of the type of act and the type of relationship. The majority of participants judged that deception of parents was acceptable when it came to the moral and personal acts, but not regarding the prudential acts. These findings show that the adolescents were considering two sides of the situation involving moral considerations (in the cases of racial discrimination and fighting) and the value of honesty and ended up judging that honesty should have lower priority than unfairness or harm. Similarly, they judged that perceived legitimate areas of personal choices should have priority over honesty. By contrast, the majority of adolescents judged it wrong to engage in deception of parents regarding the prudential acts. They thought it was legitimate for parents to have jurisdiction over activities that affected the safety and well-being of their children or adolescents. Interestingly, a greater number of participants judged it unacceptable to lie to peers than to parents regarding the acts in the moral and personal domains because peer relationships were seen to be based on equality and mutuality (as opposed to relationships of power and status differences with parents).

The acceptance of deception in processes of coordination does not only occur in adolescence. Other research shows that adults too judge that deception might sometimes be necessary to promote emotional welfare and personal choices in the context of marital relationships involving inequality of power (Turiel & Perkins, 2004). In addition, studies with physicians have ascertained that they judge deception of insurance companies to be acceptable when it is the only way to prevent serious physical harm to patients (Freeman, Rathore, Weinfurt, Schulman, & Sulmasy, 1999; Wynia, Cummins, Van Geest, & Wilson, 2000).

Coordination in decisions has also been found in research on judgments about rights and about fairness in social inclusion and exclusion. As is often discussed by moral philosophers, the idea of rights and associated freedoms are important to moral judgments (Dworkin, 1977; Gewirth, 1982; Mill, 1859). A good deal of research on judgments about rights shows that at least starting in late childhood in several cultures there is endorsement of rights to, as examples, freedom of speech, religion, and privacy. Research on rights conducted in the United States and Canada has shown that young children (Helwig, 1997), adolescents, and adults (Helwig,1995) endorse rights and judge that they are independent of rules and authority dictates. Rights are also upheld in straightforward situations, such as giving a public speech critical of the government. Moreover, it was found in several non-Western cultures that individuals endorse rights. Studies were conducted in China (Helwig, Arnold, Tan, & Boyd, 2003; Lahat, Helwig, Yang, Tan, & Liu, 2009), Africa (Day, 2014; Ruck, Tenenbaum, & Willenberg, 2011), and in the Middle East (Turiel & Wainryb, 1998). However, it is also the case that in some situations involving conflicts between rights and other moral or social considerations, such as speech advocating violence, the civil rights are not supported in order to promote welfare.

Therefore, it is often found that individuals support rights in some social situational contexts but give priority to other moral or social considerations over those same rights. Again, we see coordination between different considerations in coming to decisions in different contexts. Similar results were obtained in a set of studies in children's judgments about fairness in social inclusion and social exclusion. Whereas social exclusion is judged to be wrong and unfair in some situations, it is judged to be acceptable in other situations – such as when an individual's lack of ability would hamper a group's goals (Killen, Lee-Kim, McGlothlin, & Stagnor, 2002; Killen, Piscane, Lee-Kim, & Ardila-Rey, 2001).

The Development of Moral Judgments and Cultural Practices of Inequality

The research on honesty, rights and social inclusion supports the propositions that moral development does not occur through a process of incorporating transmitted standards or values. The research reveals that individuals actively consider different features of social situations and do not simply apply one set of standards in coming to decisions. This is to say that there is heterogeneity in thinking in ways that cannot be captured by the proposed general cultural orientations of individualism and collectivism. In addition, the research on judgments about honesty and deception with adolescents shows that they would resist directives they consider morally wrong from persons in authority and thereby accept acts of "subversion."

Since that research was conducted in the United States, it leaves open whether people in so-called collectivistic societies accept acts of social opposition and moral resistance. One of the characterizations of non-Western cultures is that their orientation to the group and interdependence entails an acceptance of their designated roles in the social system, which includes an acceptance of cultural practices that restrict freedoms and rights. Our alternative hypothesis in studies conducted in non-

Western patriarchal societies was that individuals would apply moral judgments of welfare, justice, and rights to existing cultural practices. In patriarchal cultures males hold higher status and power than females in the social hierarchy and many practices promote inequalities between them (Turiel & Wainryb, 1994, 2000; Wikan, 1982). As characterized by Wikan (1982, pp. 55-56), "The male is considered superior physically, morally, and intellectually, and women must be constrained and protected by men." We expected that females, who are subject to male dominance, would critically reflect on such cultural practices.

Research was conducted in several settings, including the Middle East, India, Colombia, and Benin (Conry-Murray, 2009; Guvenc, 2014; Mensing, 2002; Neff, 2001; Wainryb & Turiel, 1994). A typical example is the research conducted in a Druze Arab community in Northern Israel (Wainryb & Turiel, 1994). In that research, assessments were made of the judgments of adolescents and adults regarding cultural practices of inequalities between males and females, such as in educational and work opportunities, leisure activities, and decision-making within the family. In contradiction with the idea that people accept their prescribed roles and the inequalities that entails, we expected both conflicts around the practices and desires for changes on the part of females.

In the research with the Druze, as well as in other studies, we found that concerns with individual freedoms and autonomy were expressed by males and females. In particular, it is recognized that within their culture males assert the right to pursue personal choices over those of females. Females are aware of the prerogatives accorded to males and often accept their roles in these regards because of a fear of consequences. Nevertheless, females also asserted a desire for greater equality, as reflected in the comments of an 18-year-old female from the Druze community (Turiel, 2002, p. 249): "We live in a conservative culture. Maybe in the future I might want to treat my daughter in the same way I would treat my son, but the culture wouldn't let me do it. I believe in equality, but the culture would grant more to a male."

It was also found that over 80% of Druze adolescent and adult females evaluated the practices of male dominance and associated inequalities to be unfair and as requiring changes. An interesting perspective on the unfairness was provided by an adult Druze female, who stated with some irony (Turiel, 2002, p. 249):

A man's life is simple. He works, he comes back home; he has no other responsibilities. I work too and I have kids and a home. He knows that when he comes back, everything will be ready for him. That's such a pleasure. When I come home I have more work to do at home. So, who do you think deserves to get out a little and enjoy life?

Whereas the studies thus far mentioned mainly assessed people's judgments, there are ethnographic studies that also examined the actions of females in patriarchal societies. One study was conducted among people living in conditions of poverty in Cairo (Wikan, 1996), and another was with a Bedouin community in rural areas of Egypt (Abu-Lughod, 1991, 1993). In both research programs it was found that in their daily lives women often sought ways to avoid control by men and resisted unfair

practices. Such resistance resulted in good deal of conflict in social relationships. Comments from a woman from Cairo, with similarities to those of the Druze woman, illustrate the sense of conflict and resistance (Wikan, 1996, p. 31):

I tried to make Mustafa understand that we must be open with each other and mutually adjust - that we must tell each other what each of us liked and wanted from life, so we could make each other happy. But he just scowled and said, "I do as I please!" and "I am free." …Of course, the man should have his freedom, but not at the woman's expense!

From her research with the Bedouin community, Abu-Lughod described how in their daily lives women often sought to avoid control by men. They would use a number of strategies to avoid restrictions imposed by men, as well as practices like arranged marriages and polygamy. They judged those practices as unfair, as illustrated by the following response from a Bedouin woman (Abu-Lughod, 1993, p. 238):

And this business of marrying more than one wife - I wish they'd change their views on this. It is the biggest sin. The Prophet -- it is not forbidden but the Prophet said only if you treat them fairly. But a man can't, it can't be done. Even if he has money, he can't. As a person in his thoughts and his actions, he can't be fair. He'll like one more than another.

It is important to emphasize that such findings of social opposition and moral resistance are contrary to the characterizations of such non-Western cultures as collectivistic.

Conclusion

In patriarchal cultures, as in most other cultures, there are conflicts and disagreements among different individuals and different groups. In particular, there are disagreements between people in different positions in social hierarchies. As a consequence, it is difficult to draw comparisons between cultures. Along with differences within and between cultures, there can be commonalities between those in similar positions on the hierarchy in different cultures – such as similarities between those in lower positions in different cultures. The reasons there are these complex similarities and differences is that individuals, starting in childhood, construct thinking in the different social domains.

A large body of research has documented that individuals do reason about social relationships in different ways, accounting for societal customs and conventions as well as arenas of personal jurisdiction and choice. A significant aspect of orientations to social relationships is reasoning about the welfare and rights of people, as well as concerns with justice. However, understanding how people make social decisions does not end there. In addition to the analyses of the development of moral judgments, it is necessary to analyze how moral concepts are applied, and how moral considerations are weighed and balanced against other moral or non-moral

considerations. Processes of coordination are significant since many social situations include multiple considerations. Therefore, it is important to understand how individuals weigh and balance different considerations in coming to decisions in social contexts. Relatedly, moral judgments and process of coordination relate to the scrutiny that people give to cultural practices, often leading to social opposition and moral resistance.

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The Effects of Integrated Problem-Based Learning, Predict, Observe, Explain on Problem-Solving Skills and Self-Efficacy

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ABSTRACT

Purpose: This study aimed to investigate the potential effects of problem-based learning (PBL), predict observe explain (POE), and PBLPOE on students' problem-solving skills and self-efficacy in Biology. This research is based on various facts that problem-solving skills and self-efficacy of Indonesian students in biology subjects are still low.

Research Methods: This quasi-experiment employed a pretest-posttest non-equivalent control group design. One hundred and thirty-two (132) tenth graders (aged 15 to 17) from Bengkulu, Indonesia, participated in this study. The participants were homogenous concerning academic abilities. Data were collected using an essay test and observation sheets. The essay test was developed to examine the students' problem-solving skills, and observation sheets were used to evaluate the students' self-efficacy. The data were analyzed using ANCOVA and Least Significant Different (LSD) test.

Findings of the study suggest that PBLPOE has a more significant effect on students' problem-solving skills and self-efficacy compared to PBL, POE, and conventional learning. The highest scores of problem-solving skills and self-efficacy were obtained by students from the PBLPOE class, followed by the PBL, POE, and conventional groups.

Implications for Research and Practice: Based on the results of this study, it is evident that PBLPOE is effective in fostering students' problem-solving skills and self-efficacy; thus, the use of PBLPOE in Biology classrooms is highly recommended.

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Introduction

Problem-solving is a cognitive process through which knowledge, skills, and personal experiences are mobilized to identify problems, find solutions, and resolve conflicts effectively (Hoi, Bao, Nghe & Nga, 2018; Wang, & Chiew, 2010). Udeani and Adeyemo (2011) stated that exploring a curiosity about how to resolve a problem is a cognitive aspect that plays an important role in a problem-solving process. Problem-solving skills are important in the workplace to help employees deal with challenges and innovation. These challenges require them to become a professional content master and a skillful problem solver (Özreçberoglu & Çaganaga, 2018).

A preliminary study conducted to a group of senior high school students from Bengkulu in July 2017 showed students' poor skills in identifying problems and carrying out a plan to solve the problems. However, based on the results of the study, the students' ability to evaluate results and devise a plan was considered sufficient. Other relevant studies by Burns, O'Donnell, and Artman (2010) and Ancel (2016) also indicate students' inadequate skills in identifying problems and evaluating solutions as the result of teacher's lack of assistance in the classroom. Another possible cause of these students' poor problem-solving skills is the inappropriate learning strategies used in the learning process (Aurah, Cassady & McConnell, 2014).

To resolve a conflict, one needs both cognitive intelligence and self-efficacy. The correlation between problem-solving and self-efficacy has been evident (Ancel, Erkal & Gencturk, 2015; Ancel, 2016; Bars & Oral, 2017). Self-efficacy is part of the social cognitive theory, which suggests that to succeed in doing tasks and achieve goals, someone needs to believe in him/herself (Bandura, 2006). Self-efficacy allows someone to take control of specific situations and provide positive outcomes (Geitz, Brinke, & Krischner, 2015). One of the benefits of self-efficacy for self-directed learning is that it influences the extent to which students can get involved in or stick to several challenging tasks. Students with higher self-efficacy are likely to succeed in difficult situations compared to students who have a lack of self-efficacy (Kurtuldu & Bulut, 2017).

In 2017, an observation was carried out in a biology classroom to explain four aspects of self-efficacy possessed by senior high school students from Bengkulu, Indonesia. The students were categorized into a low category on "magnitude" and "generality" aspects and medium category on the "strength" aspect. The students reported low achievement in "magnitude" because of their reluctance to accomplish more difficult tasks. As a result of being used to be dependent much on the teachers in learning, the students obtained low scores in "generality." Overall, it can be concluded that students' self-efficacy needs to be enhanced (Fitriani, Zubaidah, Susilo, & Al Muhdhar, 2018). These self-efficacy issues are not only found in senior high schools but also junior high schools (Suryadi & Santoso, 2017) and even universities (Ancel, 2016).

Problem-solving skills and self-efficacy can be enhanced through an effective and meaningful learning model (Qarareh, 2016). PBL problem-based learning (henceforth referred to as PBL) focuses on developing students' belief in being able to solve

problems. An effective learning model can encourage students to construct their knowledge based on situations around them. The examples of effective and meaningful learning models are Problem Based Learning (PBL) and POE (Predict, Observe, and Explain), henceforth referred to as PBLPOE.

Several studies have reported the benefits of PBL application in science classrooms. For example, Sahbaz and Hamurcu (2012) found out that PBL was more effective than traditional learning. PBL can accommodate students' engagement in knowledge construction and knowledge application in a real-world context (Arends, 2012). PBL can improve students' problem-solving skills (Balim, Çeliker, Türkoğuz, Evrekli, & Ekici, 2015; Kadir, Abdullah, Anthony, Salleh, & Kamarulzaman, 2016). Özgen and Pesen (2010) used open-ended questions during the completion and evaluation stages of PBL to examine students' ability to solve problems and found an improvement in the students' scores. This finding proves that PBL can enhance students' ability to solve problems. Particularly, PBL can encourage students to play an active role in identifying problems based on the existing phenomena and finding solutions to the problems (Yaman & Yalcin, 2005). When students can deal with life difficulties, their self-efficacy will improve accordingly (Geitz et al., 2015; Gurlen, 2011). However, some studies show that students are frequently faced with difficulties in organizing problems and in believing in their ability to solve the problems (Nijhuis, Segers & Gijselaers, 2005). For example, students lack confidence in analyzing problems in depth. Furthermore, the problems presented are too structured and cannot sufficiently stimulate students' self-efficacy. Students with lower self-efficacy tend to be reluctant to take on the challenges presented in the PBL process (Hsieh, Cho, Liu & Schallert, 2008).

Another constructivist learning model that is expected to be able to improve students' performance is POE (James, 2010). POE activities help students think scientifically, participate in the process of solving scientific problems, discuss, explore information, and improve student learning performance (Hong, Hwang, Liu, Ho, & Chen, 2014). In POE, students are allowed to predict a phenomenon, conduct an observation, and relate the results of the observation with the prediction (Bilen, Özel, & Köse, 2016). Students reflect on their experiences by understanding a phenomenon before making predictions and discussing these predictions with their classmates, followed by observations to make a scientific explanation. These activities will provide students with a deeper understanding of the solutions found (Bowen & Haysom, 2014). Akamca and Hamurcu (2009) discovered that some components in science education, such as analogies and POE model, could be learning outcomes. Other studies also show that POE can improve problem-solving skills (Kearney, 2004) and self-efficacy (Vadapally, 2014).

The syntax of the POE learning model can complement the syntax of PBL. PBL is a learning model that helps students construct their knowledge based on the context by formulating problems without predicting and comparing the observation and the predictions. Making predictions is beneficial in helping students provide arguments on why things must happen (Karamustafaoglu & Naaman, 2015) and comparing observation results with the predictions requires high self-confidence in making

accurate judgment on the problem-solving process (James, 2010; Kala, Yaman, & Ayas, 2013), and in trusting the theoretical truth (Bilen et al., 2016). On the other hand, PBL can add formulation of problems into POE.

As mentioned before, students' problem-solving skills and self-efficacy are still insufficient. Therefore, the combination of PBL and POE is expected to provide a significant contribution to the development of students' problem-solving skills and self-efficacy. The main activities of PBLPOE include (1) problem orientation, (2) students' organization, (3) prediction, (4) investigation/observation, (5) explanation, (6) analysis and evaluation. This study aimed to investigate the effectiveness of PBL, POE, and PBLPOE in promoting students' problem-solving skills and self-efficacy. The research hypotheses for this study were formulated as follows:

Hypothesis 1: PBLPOE affects students' problem-solving skills.

Hypothesis 2: PBLPOE affects students' self-efficacy.

Method

Research Design

This quasi-experimental study employed a pretest-post-test non-equivalent control group design (Cohen, Manion, & Morrison, 2011, p. 214), which can be seen in Table 1.

Table 1

Research Design

Pretest	Treatment Group	Posttest
O_1	PBLPOE (Problem Based Learning-Predict, Observe, Explain)	O_2
O_3	PBL (Problem Based Learning)	O_4
O_5	POE (Predict, Observe, Explain)	O_6
O_7	Conventional	O_8

Research Sample

The study population contained all the tenth graders in the city of Bengkulu. Samples of this study were selected through the process of determining schools and classes. The school selection process was carried out based on National Examination scores. Ten high schools in the city of Bengkulu, Indonesia, were categorized into schools with high, medium, and low national exam scores. One school from each category was chosen for further determination of the samples. Then, the determination of the samples was conducted by administering a placement test to examine the homogeneity of the classes. The placement test was conducted in 11 classrooms (385 students consisting of 181 male students and 204 female students). Schools

participating in the test were SMAN 4, SMAN 5, SMAN 6. The results showed that all the participants were homogeneous concerning academic ability. The names of the classes were written on paper and drawn to select four random classes to receive different treatments. The students were divided into four groups: PBL (36 students), POE (30 students), PBLPOE (34 students), and conventional (32 students). The total number of the research participants was 132 students aged between 15 and 17 years old.

Research Instruments and Procedures

The instruments used to collect the data of this study were syllabus, lesson plans, student worksheets, an essay test, and teacher observation sheets. The observation sheets measured three aspects of the students' self-efficacy, i.e., magnitude, strength, and generality (Bandura, 2006) (Appendix 1), while the essay test was conducted to examine the participants' problem-solving skills. The indicators of the test assessed the students' ability to identify problems, devise a plan, carry out the plan, and evaluate the results (modified from Mourtos, Okamoto, & Rhee, 2004; Greenstein, 2012) (Appendix 2).

The syllabus, lesson plans, student worksheets, essay tests, and teacher observation sheets were validated before they were used. The validation process was conducted by a team of experts that consisted of two university lecturers with a doctorate and one high school teacher. These validity tests were performed to examine the content validity and construct validity of the instruments. Content validity is the accuracy level of the instrument content according to the curriculum, while construct validity is related to the science concept to be tested. Construct validity refers to the suitability of the measuring instrument with the ability to be measured. Identity, core competencies, basic competencies, materials, learning activities, assessment techniques, time allocation, learning resources, consistency, and language use were components to be examined in the syllabus and lesson plans. Format, content, language use, and appearance were components to be tested in the student worksheets, and substance evaluation, construction, and language use are components to be validated in the essay tests and teacher observation sheets.

The validation syllabus, lesson plans, student worksheets, essay test, and teacher observation sheets results were analyzed descriptively to check whether the instruments used in this study complied with one of the following criteria: $1.00 \leq X \leq 1.60$= not valid; $1.60 < X \leq 2.20$= less valid; $2.20 < X \leq 2.80$ = moderately valid; $2.80 < X \leq 3.40$= valid; and $3.40 < X \leq 4.00$= highly valid. The validity scores of the syllabus, lesson plans, student worksheets, essay tests, and teacher observation sheets, and problem-solving skills tests were 95.02, 98.20, 93.12, 94.55, and 93.45, respectively. The validity scores suggest that all instruments are valid and can be used to collect the data. Before conducting the treatments, the instrument used to test students' problem-solving skills was tried out to 35 students from the eleventh grade. The test consisted of 10 items, and the results of the tryout were analyzed using Pearson Correlation Test and Cronbach's Alpha. The results of the analysis showed that out of 10 tryout items.

Nine questions were considered valid, with a significance value of 0.000 <0.05 and reliable with a coefficient of 0.949.

The experiment was carried out for one semester (February-June 2018) in the academic year of 2017/2018. Materials taught during that semester were Plants, Animals, Ecosystem, and Environmental Pollution. The main activities of each treatment group (PBL, POE, PBLPOE, and conventional) are described as follows. Learning in the PBL classroom was performed in five stages: (1) the students were asked to formulate several questions based on a phenomenon provided on the worksheet, (2) they were divided into groups and the teacher-directed them to formulate the problem based on the learning objectives, (3) they conducted an investigation in groups. The teacher assisted them in collecting relevant information, (4) they presented the results of the investigation, (5) together, they did self-reflection and provided feedback on the work.

Unlike the PBL group, learning in the POE classroom was conducted through three steps. *First*, the teacher delivered the background of the problem and let the students make predictions based on questions that had been determined by the teacher. *Second,* the students did an observation with the teacher's assistance to justify their predictions. *Third,* the students presented the results of the observation and compared them with their initial predictions.

As it resulted from the combination of PBL and POE, the PBLPOE learning consisted of the following six phases: (1) the students actively formulated as many questions as possible based on texts found in the worksheet, (2) the teacher guided the students to sit in groups and to formulate problems relevant to the learning objectives, (3) the students made predictions in groups, (4) they did an investigation and sought for various information to help them determine the solution to the problem, (5) they presented the results and compared their predictions with the results, (6) together, the teacher and the students analyzed and evaluated the resolved problem.

Learning in the conventional classroom was not specifically categorized into stages. The process was begun with the teacher's delivering materials, followed by a question and answer session, and closed by a classroom discussion. At the end of the meeting, the teacher assigned the students to read the materials required for the next meeting.

Data Analysis

Before proceeding with data analysis, normality and homogeneity tests were conducted. The normality test showed that the research data were distributed normally with an average score of 0.056 (problem-solving skills) and 0.086 (self-efficacy). The data were also considered homogeneous as problem-solving skills scored 0.053, and self-efficacy obtained 0.268 on the homogeneity test. The ANCOVA and Least Significant Differences (LSD) test analyses were performed to determine the effectiveness of PBL, POE, and PBLPOE in improving students' problem-solving skills and self-efficacy. ANCOVA is the most highly recommended statistics analysis for an

experiment with a pretest-posttest control group design, while the LSD test can be used to determine the classroom with the most significant difference after receiving a particular treatment (learning model in this case) (Creswell, 2012).

Results

1. The Effectiveness of Learning Models in Improving Students' Problem-Solving Skills

The effects of learning models on the students' problem-solving skills are presented in Table 2.

Table 2

The Results of the ANCOVA Analysis on the Effects of Learning Models on Students' Problem-Solving Skills

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Model	23487.039[a]	4	5871.76	66.40	.000
Intercept	36248.709	1	36248.70	409.92	.000
Problem-solving	.080	1	.080	.001	.976
Class	22927.194	3	7642.39	86.42	.000
Error	8223.748	93	88.42		
Total	512060.600	98			
Total average	31710.788	97			

Table 2 showed that the p-value was smaller than alpha 0.05 (p<0.05) with a significance level of 0.000; hence, hypothesis 1 "Learning models affect students' problem-solving skills" was accepted. The results of the LSD test, which was conducted after the ANCOVA analysis, were recorded in Table 3.

Table 3

The Results of the LSD Test of the Effectiveness of Learning Models in Improving Students' Problem-Solving Skills

Model	Pretest	Posttest	Difference	Improvement (%)	Average Score	LSD Notation		
Conventional	25.20	52.16	26.95	106.93	52.15	a		
POE	23.39	64.10	40.70	173.99	64.10		b	
PBL	22.85	73.35	50.50	221.01	73.36			c
PBLPOE	28.01	94.44	66.42	237.07	94.43			d

As shown in Table 3, PBLPOE was significantly different from POE, PBL, and conventional in improving the students' problem-solving skills. The highest score of problem-solving skills was observed in the PBLPOE class (94.43). The PBL class ranked second with an average score of 73.37 and was followed by the POE class with an average score of 64.10. The lowest problem-solving score was reported by the conventional group. The average problem-solving skills scores of the PBL, POE, PBLPOE, and conventional groups of students were summarized in Figure 1.

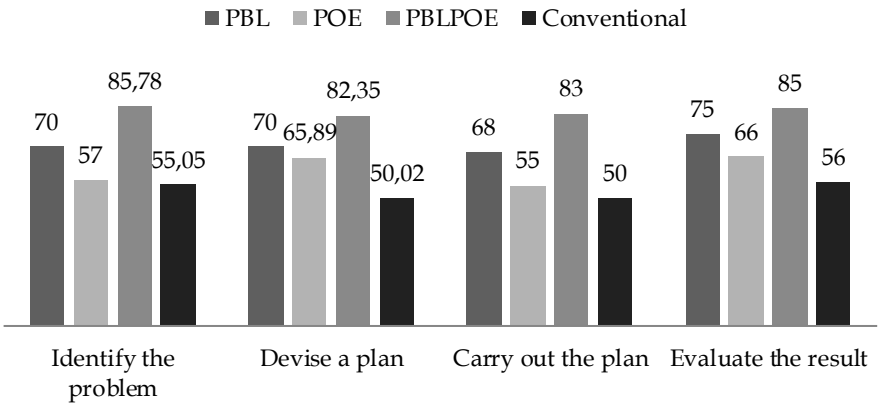

Figure 1. The Average Problem-Solving Skills Score of the POE, PBLPOE, and Conventional Groups of the Students

2. The Effectiveness of Learning Models in Improving Students' Self-Efficacy

The effects of learning models on the students' self-efficacy were analyzed using ANCOVA. The results are presented in Table 4.

Table 4

The Results of the ANCOVA on the Effects of Learning Models on Students' Self-Efficacy

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected model	10016.272[a]	4	2504.068	114.15	.000
Intercept	5713.525	1	5713.525	260.45	.000
Self-efficacy	1.878	1	1.878	.086	.771
Class	8353.026	3	2784.342	126.92	.000
Error	2040.105	93	21.937		
Total	588179.293	98			
Total average	12056.377	97			

a. R Squared = .831 (Adjusted R Squared = .824)

As shown in 7, the p-value was smaller than alpha 0.05 ($p<0.05$) with a significance level of 0.000; hence, hypothesis 2 "Learning models affect students' self-efficacy" was accepted. The difference in the effectiveness of each learning model (PBL, POE, PBLPOE, and conventional) in improving the students' self-efficacy is shown in Table 5.

Table 5

The Results of the LSD Test of the Effectiveness of Learning Models in Improving Students' Self-Efficacy

Model	Pretest	Post-test	Differ-ence	Improve-ment	Average Score	LSD Notation
Conventional	49.44	63.48	14.03	28.39%	63.55	a
POE	51.50	75.77	24.27	47.13%	75.79	b
PBL	53.15	77.74	24.59	46.27%	77.72	b
PBLPOE	55.78	91.80	36.02	64.58%	91.71	c

Table 5 indicated that there was a significant difference in the effectiveness of PBL, POE, PBLPOE, and conventional learning in improving the students' self-efficacy. The highest self-efficacy score was found in the PBLPOE class (91.72), followed by the PBL (77.73), POE (75.79), and conventional (63.56) classes. The average self-efficacy scores of the PBL, POE, PBLPOE, and conventional groups of students are summarized in Figure 2.

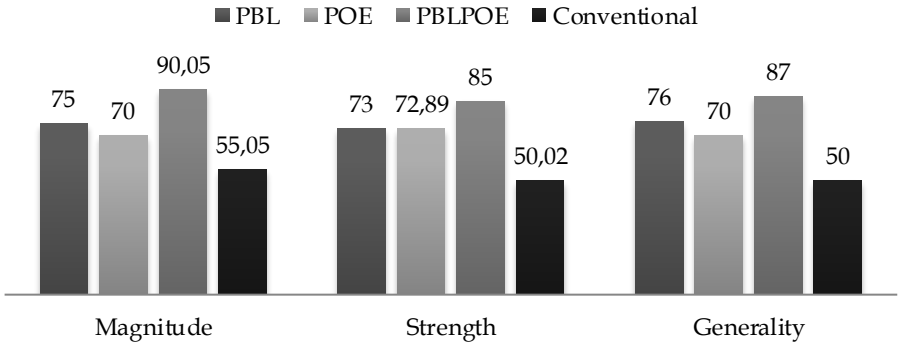

Figure 2. The Average Self-Efficacy Scores of the PBL, POE, PBLPOE, and Conventional Groups of Students

Discussion, Conclusion, and Recommendations

The results of this study showed that the combination of PBL and POE (PBLPOE) had a significant effect on the students' problem-solving skills. This study has proven that the first phase of PBLPOE (problem orientation) allows students to work on several reading comprehension questions related to Plantae (plants), Animalia (animals), ecosystem, and environmental pollution. These questions are formulated in such a way to challenge students to be able to construct their prior knowledge by identifying as many problems as possible. The presentation of problems encourages students to improve their problem-solving skills (Syed & Feyzollah, 2012) because one of the indicators of problem-solving skills in identifying problems (Greenstein, 2012).

Students' problem-solving skills can also be enhanced through the investigation/observation activity accommodated in PBLPOE. At this stage, students are required to be actively involved in a collaborative process of exploring various resources to find a solution to the problem and collect data to justify their predictions. This activity helps students develop the skills to devise a problem-solving plan and carry out the plan. Based on the results of this study, the students could obtain high scores in both indicators. In "devise a plan," students need to elaborate several alternative solutions; then, select the most appropriate one in "carry out the plan." These activities can be found in the observation process. Confirmed by Yuksel and Ates (2017), an observation activity can help develop students' skills in resolving conflict because, to obtain relevant information, students need to involve all senses during the process.

Findings suggest that there is a difference between PBLPOE and PBL in improving students' problem-solving skills. In the PBLPOE class, students need to make predictions and conduct observations. The "making predictions" stage of PBLPOE, which contains the "devise a plan" activity, can improve students' problem-solving skills. During the "making predictions" process, students generate strong arguments and plan solutions to the problem based on their prior knowledge. The student worksheet can guide students in doing these activities. Making predictions allows students to develop ideas and devise a plan to solve the problem (Kala et al., 2013). Making predictions also involves the activity of formulating questions that need to be answered through observations. According to Vadapally (2014), an observation is conducted to find answers to questions, provide space for students to work on their ideas, plan solutions, and select the best solution to be executed. Karamustafaoglu and Naaman (2015) explain that one can acquire new knowledge if one can make assumptions of a problem before proceeding with the exploration of information sources.

The reason why the POE group could not perform better than the PBLPOE group in problem-solving maybe that POE does not facilitate the early stage of a problem-solving process, which is identifying problems. In POE, instead, the problem is already introduced in the beginning by the teacher, and the students only need to make predictions based on the information given. Research conducted by Mourtos et al. (2004) suggests that one's problem-solving skills are reflected in the way s/he detects

the problem. In short, identifying problems is crucial in problem-solving since it leads to knowledge discovery.

This study also found a difference between PBL and POE in promoting students' problem-solving skills. The difference lies in the syntax of PBL, which supports the success of a problem-solving process. The PBL students' abilities to identify problems, devise a plan, carry out the plan, and evaluate the result were in the medium score category. PBL helps students develop their problem-solving skills because, during the learning process, the students are required to be active in identifying problems, finding the solutions, and evaluating them. Similar results were reported by Udeani and Adeyemo (2011), who confirmed the effectiveness of PBL in developing students' problem-solving skills.

The three distinctive learning models, namely PBL, POE, and PBLPOE, are significantly different from conventional learning in improving students' problem-solving skills. Conventional learning is characterized by the transfer of knowledge from teachers to students. As a result, the students cannot learn how to solve problems by themselves, and the students become less active. In other words, conventional learning is not very effective in promoting students' problem-solving skills. Mahanal, Zubaidah, Bahri, and Dinnuriya (2016) also argue that an effective learning model should be able to help students analyze a problem, find solutions to the problem, and do a reflection on the process.

The findings of this study have justified that the combination of PBL and POE, or the so-called PBLPOE, is effective in promoting students' self-efficacy. At the "predict" phase of PBLPOE, students are allowed to make temporary predictions based on the problem presented in the worksheet. This activity encourages students to shape confidence in their own opinions and rationales related to the identified problem. Thus, students' self-efficacy, particularly the strength aspect, can be improved to a higher level. As a result, students can easily construct new knowledge and develop a higher degree of self-efficacy (Aurah et al., 2014; Kala et al., 2013; Yuksel & Ates, 2017).

The results of the analysis suggest that PBLPOE is significantly different from PBL, POE, and conventional learning in improving students' self-efficacy. Students' self-efficacy has been promoted at an early stage of PBLPOE that is prediction making. Prediction making requires students to believe in their judgment about the problem (James, 2010). The next activity that students should do in PBLPOE is to investigate. The results of this study showed students' high magnitude scores, which indicate students' optimism and determination. During the investigation process, students wander to collect resources or related literature that can support their predicted solutions to the problem. Similarly, Bars and Oral (2017) revealed that students' self-efficacy could be improved during investigations they conducted to find evidence to prove their assumptions. Students with high self-efficacy scores are more confident in solving a problem compared to students with low or weak self-efficacy (Hsieh et al., 2008).

The "explanation" activity can also contribute to improving students' self-efficacy, especially the "generality" and "strength" aspects. The "generality" aspect measures

students' mastery of the topics and students' ability to interact with other students and teacher in presenting the results of the investigation, while the "strength" aspect evaluates students' perseverance and self-consistency in presenting the research data obtained during the observation and in displaying the comparison between the investigation results and the predictions. Other factors that may affect students' self-efficacy include self-achievement, social interactions, experiences, and physiological aspects (Zimmerman, 2000).

There is no significant difference between PBL and POE in improving students' self-efficacy because both learning models can accommodate students' active participation in doing an investigation of the predetermined topics. In line with Gurlen (2011), during an investigation process, students develop strong self-confidence in seeking the right solution to the problem. Both PBL and POE also facilitate peer discussions, which allow students to present their findings to other friends in front of the classroom and get feedback from other pupils. The active classroom discussion may lead to the improvement of students' self-efficacy (Hamidi & Shirdel, 2015) and rich performance in accomplishing a task (Honicke & Broadbent, 2016; Richardson, Abraham & Bond, 2012).

PBL, POE, and PBLPOE are significantly different from conventional learning in improving students' self-efficacy, proven by the low scores obtained by the conventional group of students in magnitude, strength, and generality. On the other hand, conventional learning is more teacher-centered. This type of learning does not provide an opportunity for students to resolve conflicts independently but to merely receive the information being delivered by the teacher. Usher (2009) suggests the students' self-efficacy cannot be properly developed during the learning process. If students are not given any chance to do an investigation or to search for information by themselves, their self-efficacy cannot be promoted. Research conducted by Altunsoy, Cimen, Ekici, Atik, and Gokmen (2010) showed that students who were taught with traditional methods were likely to possess low self-efficacy.

The development of students' problem-solving skills and self-efficacy is indeed influenced by learning models implemented in the classroom. The combination of PBL and POE or PBLPOE has been proven highly effective in improving students' problem-solving skills and self-efficacy compared to PBL or POE alone or conventional learning. It is important that students can develop problem-solving skills and self-efficacy at an early age because of the 21st-century demand. Therefore, the use of PBLPOE in biology classrooms is strongly recommended. This study has revealed the effects of PBLPOE on students' problem-solving skills and self-efficacy; however, some limitations should be acknowledged: (1) this study only involved students from the tenth grade of senior high school, (2) this study was conducted for a semester only or in 12 meetings, and (3) this study only focused on one particular school subject that is Biology.

Conclusions and Suggestions

Based on the results of this study, it can be concluded that PBL, POE, and the combination of both as PBLPOE has an effect on senior high school students' problem-solving skills and self-efficacy. Among all, PBLPOE is considered the most effective in promoting students' problem-solving skills and self-efficacy. Therefore, the use of PBLPOE in the classroom is very advisable. It is also recommended for future researchers to consider performing a more in-depth investigation on the same topic to more diverse population targets, such as a group of students from a different level of education or a group of students who study other subjects.

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Appendix 1

Self-Efficacy Aspects

No	Aspect	Score	Description
1	Magnitude	4	1. Show an optimistic behavior in accomplishing tasks. 2. Able to accomplish either easy or difficult tasks. 3. Able to finish the most difficult tasks. 4. Show a maximum effort in accomplishing tasks.
		3	Contain 3 out of 4 indicators
		2	Contain 2 out of 4 indicators
		1	Contain 1 out of 4 indicators
2	Strength	4	1. Show perseverance in learning. 2. Show pertinence in accomplishing tasks. 3. Show self-consistency 4. Show high self-confidence in learning.
		3	Contain 3 out of 4 indicators
		2	Contain 2 out of 4 indicators
		1	Contain 1 out of 4 indicators
3	Generality	4	1. Have good time management. 2. Perform content mastery. 3. Perform mastery of tasks. 4. Able to deal with various situations and conditions.
		3	Contain 3 out of 4 indicators
		2	Contain 2 out of 4 indicators

(Source: Bandura, 2006, p. 313)

Appendix 2

Indicators of Problem-Solving Skills

No	Indicator	Score	Description
1	Identify problems	4	1. Provide a clear description of the problem. 2. Mention all related facts. 3. Determine concepts or categories. 4. Provide information/data relevant to the problem.
		3	Contain 3 out of 4 indicators
		2	Contain 2 out of 4 indicators
		1	Contain 1 out of 4 indicators
		0	No answer
2	Devise a plan	4	1. Develop a plan to solve the problem. 2. Propose four alternative solutions. 3. Select relevant theories and principles to solve the problem.
		3	1. Develop a plan to solve the problem. 2. Propose three alternative solutions. 3. Select relevant theories and principles to solve the problem.
		2	1. Develop a plan to solve the problem. 2. Propose two alternative solutions 3. Select relevant theories and principles to solve the problem.
		1	1. Develop a plan to solve the problem. 2. Propose only one solution. 3. Select relevant theories and principles to solve the problem.
		0	No answer
3	Carry out the plan	4	1. List all possible solutions to the problem. 2. Evaluate and analyze the possibility of each option before executing the plan. 3. Determine parties that need to be contacted to obtain information related to the execution of the plan.
		3	1. List all possible solutions to the problem. 2. Make a rational decision on selecting one alternative solution.

			3. Determine parties that need to be contacted to obtain information related to the execution of the plan.
		2	1. List all possible solutions to the problem. 2. Select one alternative solution without any rationale. 3. Determine parties that need to be contacted to obtain information related to the execution of the plan.
		1	1. List all possible solutions to the problem. 2. Cannot make any decision on which plan should be executed. 3. Do not determine parties that need to be contacted to obtain information related to the execution of the plan.
		0	No answer
4	Evaluate the results	4	1. Examine the aptness of the solution. 2. Make an assumption relevant to the solution. 3. Predict the results. 4. Select an appropriate medium to communicate the solution.
		3	Contain 3 out of 4 indicators
		2	Contain 2 out of 4 indicators
		1	Contain 1 out of 4 indicators
		0	No answer

(Source: Modified from Mourtos et al., 2004, p. 2; Greenstein, 2012, p. 70)

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A Case Study Regarding of the Parental Responsibilities to Their Children

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ABSTRACT

Purpose: This research was conducted to identify the responsibilities the parents did not fulfill. It was carried out in a primary school in Aydin province in the first half of the 2018-2019 academic year.

Research Method: The research was a qualitative research design and a case study. A descriptive case study was adopted in this study. Nine primary school teachers were recruited according to the criterion sampling method. The data was gathered by a semi-structured interview form and descriptive data analysis was conducted.

Results: According to the results of the study, it was found that the parents in the primary school did not fulfill their responsibilities adequately. These unfulfilled responsibilities were physical, educational and emotional responsibilities. The reasons for not being able to perform parental responsibilities were listed as economic, parent or family-related causes.

Implications for Research and Practice: The study suggested that students should get free breakfast at school; couples should get parental training both before and after they have become parents, public service advertisements on responsibilities of parents should be broadcasted on TVs, and talks of imams should include the importance of parental responsibilities in their Friday preaches. These suggestions are believed to increase parents' participation in school activities and encourage them to comply with their parental responsibilities. Also, suggestions for researchers are given. The same research could be carried out in schools with low and high socio-economic students or private schools and public schools to make comparisons.

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Introduction

The collaboration of teacher-student-parent in education is essential for the well-being of children, the schools, the education system and the state. The legislation in the Turkish Education System (For example; Regulation on Secondary Education Institutions, 2013; Regulation on Preschool and Primary Education Institutions, 2014 etc.) regarding who can be the students' parents states that they can be family members or persons other than the family members who take the responsibility of the students.

The student parents refer to the student's mother, father or the person who has agreed to take the legal responsibility (Scholarship, Social Assistance and School Board Regulation, 2016; Regulation on Special Education Services, 2018). In boarding schools, each student should have a parent, or one of the school administrators must be designated as the parent of the student depending on the written permission of the parent, and this parenthood is limited to the education of students (Regulation on Secondary Education Institutions, 2013; Regulation on Preschool and Primary Education Institutions, 2014; Scholarship, Social Assistance and School Board Regulation, 2016). A school administrator can be assigned as a parent or a guardian within the knowledge of the police directorate to foreign students who do not have a parent, and in case of disagreement on the custody of the student judicial decision is taken into consideration. It is stated that school records will be taken as the basis in cases where the trial process related to custody continues (Regulation on Secondary Education Institutions, 2013; Regulation on Preschool and Primary Education Institutions, 2014).

Parents have several responsibilities. Each married couple automatically takes on responsibilities with the birth of their children (Hall, 1999; Lowe, 2005). These responsibilities are lost by the death of the child and the death of one of the parents and when one of the parents is not given custody in case of a divorce (Lowe, 2005). Parents' obligations include everything related to the upbringing of the child and all decisions regarding the child's life such as the environment in which she/he will live, the choice of school, or the medical treatment to be received or turned down (Henricson, 2008; Moyo, 2014). Parents are responsible for their children's development of necessary skills and all their developments (Dethloff, 2005). Children's development depends greatly on their family and parental background (Muller & Kerbow, 2018; Wright, Shields, Black, & Waxman, 2018).

Parental responsibility begins with the formal registration of the child to the school and continues throughout the education process. Parents should cooperate with administrators, teachers and education authorities, and actively participate in the process of creating and developing educational programs involving their children (Aydin, 2006). Parents' responsibility covers the physical care of the child and involves that the child is being raised in a safe and non-violent manner (Dethloff, 2005). This is not just limited to the home. Parents also have responsibilities for children attending school. Parents visit teachers and the school and share the responsibility of the children's education with the school. Parents should contact the

teacher on issues related to class and student activities, student needs, teaching materials, expectations and responsibilities. They should be informed by the school administration or the teacher if there is a problem with the child's education or the school itself (Karabag, 2007) because parents have a very important, critical, and key role in the education of their children. So, they must fulfill their responsibilities (Sheldon & Jung, 2018; Wang & Sheikh-Khalil, 2014). Students whose parents are participated in their school life have a greater chance of succeeding in school (Marquez, 2019).

Dulger (2015) defines the responsibilities of the parents as taking part in at least two of the extracurricular activities of the school, being aware of the announcements of the school, submitting the questionnaires sent by the school on time, and providing accurate information about their children. Dulger (2015) also lists the following duties as essential responsibilities of parents; taking part in the School Development Management Team and the School Family Association meetings and elections, contributing to the assignments of the students when necessary, paying attention to the free time activities of children to ensure that they also allocate time for school work etc.

Aydin (2006) examined the responsibilities of parents under five headings. *(1) Parents' responsibilities for the physical needs of their children:* This includes the bed, room, desk, dressing, nutrition, personal care, health and hygiene, treatment and dental care of the child. *(2) Parents' responsibilities for the emotional needs of their children:* All children should be treated equally and fairly, and no children should be humiliated or criticized. *(3) Parents' responsibilities for the educational needs of children:* Parent should enroll their children at a school, monitor the educational development, cooperate with the school, teach them to respect others and ensure that the child complies with school rules. *(4) Parents' responsibilities for the entertainment needs of the children:* Parents should provide necessary resources for the child to participate in teamwork and develop hobbies, skills, and personal interests. *(5) Parents' responsibilities for disciplining their children:* They should develop a positive attitude towards the school, perform consistent discipline practices, avoid physical punishment, develop their communication skills and teach them to take responsibilities.

Families are responsible for their involvement in school-related activities. Academic achievement is very effective in the socialization of the child with the community. Therefore, communication channels with parents should be kept open. These communication channels include one-to-one interaction between parents and teachers, parent-teacher meetings, phone calls, e-mails, WhatsApp messages, the letters of absenteeism of students and home visits (Kiral, 2017a), and they can be used to remind parents of their responsibilities and inform them about their children's progress and communicate them (Coelho et al., 2018). Other responsibilities of parents are related to their involvement of the school activities. School-based parental involvement (e.g. parents attending school activities, volunteering etc.) effects the student in a positive way (Altschul, 2011; Wang & Sheikh-Khalil, 2014). Because they are the part of school culture (Kiral & Kacar, 2016).

For example, if the parents of students with low socio-economic status or low academic achievement participate in school activities, they play an important role in their success in school (Benner, Boyle & Sadler, 2016). So, involvement responsibility is the key factor of students' socialization, success, and behaviors. The parents should participate in the activities. There are other responsibilities of parents in the Student-Parent-School Agreement.

In the Student-Parent-School Agreement (2015), parents agree to send their kids to school on time, follow the announcements of the schools, submit the questionnaires sent by school on time, attend school development, teacher-family-school association meetings, help their children with their homework when necessary and ensure that their children are dressed according to the dress-code rules. They should never do the homework of their children on their behalf, should pay attention to their sleep routines and rest hours, attend parent training seminars organized by the school, assign appropriate responsibilities, carefully read the discipline regulations in the parent-student handbook and comply with the discipline rules, inform the school about the changes in the child's mental and physical condition in a timely manner and should avoid exposing the child to physical and psychological violence.

There is some research focusing on the academic success of the child's family interest (for example Altschul, 2011; Benner, Boyle, & Sadler, 2016; Celenk, 2003; Marquez, 2019; Quiocho & Daoud, 2006 etc.). Another study on parents is related to parent participation in the school (eg. Kocak, 1991; Orman, 2012; Sui-Chu & Willms, 1996; Wang & Sheikh-Khalil, 2014 etc.). Other studies were conducted on the importance of school-family cooperation. (eg. Epstein & Sanders, 2006; Hornby, 2000; Marquez, 2019 etc.). This research is different from the previous ones. When the researcher was a teacher and a school administrator; she observed parents who did not fulfill their responsibilities. Parental responsibilities are important for the upbringing of the generation. Parents hold several responsibilities that are important for the education system. The researcher observed some problems with their parental responsibilities. Parents were responsible for the students who came to school without breakfast and school materials, dirty clothes etc. Just being a parent of a child is not enough to raise a child. So, the researcher thought it must be a study based on the variables of previous studies. However, there is limited research on the responsibilities of parents. There has been no similar research like it; and thus, the lack of such research makes the research important. This research aims to close the gap in this area. According to the results of this study, it will be easier to take measures by the Ministry of National Education. Therefore, this study aims to explore the responsibilities that families fail to fulfill and seeks to answer the following research questions:

According to the views of primary school teachers;

1. What are the responsibilities that families have not fulfilled?
2. Why do parents not fulfill their responsibilities?
3. What are the suggestions to help parents fulfill their responsibilities?

Method

Research Design

This study is a qualitative case study design. The qualitative design provides in-depth research with few people (Patton, 2014). The case study aims to describe and present the actual situations in real life (Creswell, 2016). This research aims to reveal the current situation; and therefore, a descriptive case study was adopted. In this study, the responsibilities of the parents of a primary school in an immigration region and the reasons for not fulfilling their responsibilities are analyzed and interpreted (Akar, 2016; Merriam, 2013; Yin, 2011). In case studies, context is described in detail from a holistic perspective and explained to the reader (Akar, 2016; Yin, 2011). For these reasons, the study was a case study. The school where this research was carried out is presented below.

Research School: Migration Primary School

The school was coded under the name of the Migration Primary School. The criterion sampling method was used to select the school (Merriam, 2013; Patton, 2014). It was thought that the parents in the selected school did not fulfill their responsibilities. Because the selected schools were located in a district that received migrated families; the parents at school were either unemployed or workers, students mostly came from extended families, and the parents did not meet most of their responsibilities.

Migration Primary School is a public school that attracts students from lower socio-economic families. The school is in a suburb. Students or parents mostly migrated from Eastern Turkey. The mothers of students are usually primary school graduates and the illiteracy rate among the parents is quite high (it is detected by the parents' education status survey conducted by teachers, and then teachers told the researcher about the profile of parents). The fathers are usually primary or secondary school graduates and some fathers are illiterate. The mothers are housewives or work as maids and baby-sitters; fathers are employed in construction or other sectors as seasonal workers. Some are either unemployed or in prison. The families do not have a stable income and do not make more than minimum wage. They also do not have an opportunity to get regular jobs.

The rate of unemployed parents is high. The fathers mostly work in the construction sector during summertime and they are unemployed during winter or do occasional jobs. Therefore, they spend most of their time in coffee houses. There are at least four or five kids in every family, and most families live in the same house with extended family members such as grandparents, aunts, uncles, nephews and nieces. The houses are very small with no proper heating facilities; therefore, only one room is being used in the flats/houses. Children spend their time at school during the day and after school, they play on the streets until dinner time. This eases the family life for parents; and therefore, students are allowed to play out until late hours (The information in this section was expressed by the teachers and researcher's observations).

Participants

The study was conducted with volunteer teachers who were working in a primary school in Aydin province in the first semester of the 2018-2019 academic year. The teachers were interviewed in the study because the teachers always observed the parents carefully and they would state their opinions impartially. The school principal and his assistant didn't want to participate in the study, so the study was conducted only with the teachers. Therefore, other actors were excluded from the study. Participants were selected according to the criterion sampling method. Selected criteria for teachers were: *"at least 10 years of professional experience and at least 5 years of service in Migration Primary School."* This was because only teachers who worked for a long time would be able to have an idea about the profile of the parents. The information about Migration Primary School teachers is presented in Table 1.

Table 1

The Information about Migration Primary School Teachers

Teacher's Name	Gender	Age	Professional Experience (year)	Time Spent in This School (year)
Ayse	F	48	21	6
Selin	F	46	23	5
Ece	F	47	23	6
Ilke	F	36	13	7
Bilge	F	41	20	6
Emre	M	39	15	7
Selda	F	47	25	6
Ertan	M	40	20	9
Ahmet	M	54	22	14

When Table 1 is examined, nine primary school teachers participated in the study. The youngest of the teachers was 36 years old and the oldest was 54 years old. The teachers had more than 13 years of professional experience. The participants of this research were teaching the second grade (two teachers), the third grade (two teachers), and the fourth grade (four teachers). None of the teachers were teaching the first grade this was because teachers of the first grade had less than five years of experience. Also, first year teachers do not have English or Religious and Moral Knowledge Classes, and they usually have literacy courses or activities.

Data Collection and Analysis

Firstly the literature was reviewed, and a semi-structured interview form was prepared. When preparing the form, one primary school teacher and one academician were consulted for scope and validity and the pilot study was carried

out with one teacher. Pilot study was not included in the study. Because the pilot study was conducted about the clarity and adequacy of the questions. The questions were asked and took the answers. The similar and overlapping questions were excluded from the research. A pilot participant's opinions were received. And the semi-structured interview form was created. Secondly, *"Official/legal written permission"* was received from the Provincial Directorate of National Education. In the semi-structured interview form, the following questions were asked; *"What are the responsibilities of parents?, Are the parents fulfill their responsibilities? (If their responses are no) Why do you think parents are not fulfilling their responsibilities?, What could be done to help parents fulfill their responsibilities? etc."* The interviews were conducted in comfortable and quite indoor spaces such as the room of principal or teachers (Interviews were conducted outside of class hours). The interviews lasted around 139 minutes. Then, the participants were informed about the study and they were given assurance that the confidentiality would be respected and that the data they provided would not be shared with the third parties. The interviews were conducted face-to-face and recorded with a voice recorder with subject to the consent of the participants. The interviews were then transferred to the computer.

The transcripts were around 20 pages. Descriptive data analysis was conducted, categories and sub-categories were formed. The researcher followed these stages: The researcher organized and prepared the data for analysis, coded and described the data, classified and categorized themes, connected and interrelated the data, interpreted and made sense of the data (Yildirim & Simsek, 2005).

Trustworthiness, Validity and Objectivity

Trustworthiness, validity and objectivity are important in qualitative research (Creswell, 2016; Guba, 1981; Lincoln & Guba, 1986). For internal validity, strategies such as reducing prejudices, participant confirmation, and triangulation were used (Creswell, 2016; Merriam, 2013; Patton, 2014). In this study, various strategies such as analyst and participant triangulation (Creswell, 2016; Merriam, 2013; Patton, 2014) and direct quotations were used (Yildirim & Simsek, 2005). Direct quotations mean that the views of the participants in the study are presented without any editing. A different researcher was asked to code the data for validity. Then, the participants were asked to confirm their answers. At the end of the research, the interviewer summarized each interview and asked the participants to verify them. After the audio recordings, the researcher asked whether there was anything participants would like to add.

For external validation, the purposive sampling method was used, the literature was reviewed, and an external researcher examined the research process and its results. For objectivity, the method of reducing the prejudices of the researcher was used (Guba, 1981; Lincoln & Guba, 1986). The formula of Miles and Huberman (1994) were used to calculate the reliability in the study. A different researcher re-coded the data to calculate the disagreement and agreement in coding. The agreement rate was 88%. Miles and Huberman (1994) state that 80% of an agreement the research is reliable so it can be said that the findings are reliable.

The Role of the Researcher

The research was carried out to investigate what the responsibilities of parents were against their children and why they did not fulfill their responsibilities. While the researcher was a teacher in a different school with a similar student-parent profile before becoming an academician, she has observed that the parents have not fulfilled their responsibilities towards their children. She wanted to investigate the reasons for this. Interviews were conducted by the researcher herself by taking legal permission.

During the research, it is essential that personal prejudices, feelings, thoughts, and evaluations are excluded from the research (Lopez & Willis, 2004). The researcher who conducted the interviews avoided prejudice and behaved objectively, and acted in accordance with professional and academic ethics principles. The researcher avoided examples, expressions that could reveal the identity of the participants. Each participant was given a pseudonym. The pseudonyms were Ayse, Selin, Ece, Ilke, Bilge, Emre, Selda, Ertan, and Ahmet. In addition, quotations were provided in the results section.

Results

This section of the study will look into the responsibilities the families did not fulfill, the reasons for not fulfilling such responsibilities and the suggestions that could help families.

The Responsibilities that Parents did not Fulfill

The study first identified the responsibilities the families did not fulfill, and three categories were formed related to these responsibilities: parents' physical, educational and emotional responsibilities. The information about these categories is presented in Table 2, 3 and 4.

Table 2

The responsibilities Parents did not Fulfill (Raising a Child)

		Unfulfilled Raising a Child Responsibilities
Physical	Nourishment	Making breakfast Gaining the habit of a balanced diet Preparing lunch for school Ensuring that the child does not eat processed food
	Hygiene	Ensuring that the child is clean and has hygiene habits Dressing up the child
	Health	Taking the child to a doctor when s/he is ill Paying attention to the personal care of the child (such as a bathroom)
	Development	Needs analysis Monitoring physical development
	Security	Ensuring that the child is safe Providing shelter and accommodation

Table 2 Continue

		Unfulfilled Raising a Child Responsibilities
Social	Discipline	Discipline
		Ensuring that the child does not use cigarettes, drugs or alcohol
		Raising the child with rules
		Keeping an eye on the friends of the child
		Being careful when the child goes out
		Avoiding verbal violence (scolding and shouting)
	Affection	Showing love and affection
		Preparing the child for the school
		Giving allowances
		Being a role model

When Table 2 is examined, the responsibilities that parents did not fulfill were divided into two categories; physical and social. The physical responsibilities were coded as nutrition, hygiene, health, violence, development and security, and quotations were provided under each category. When the physical responsibilities were examined, it was determined that the families did not monitor nutrition, hygiene, personal care, health, physical development of their children, and applied violence to their children, which did not prevent them using slang language but provided shelter and accommodation. The social responsibilities included discipline and affection with statements under each of them. Some quotations from the interviews were presented below. Quotations related to physical and social need responsibilities;

- *They also have responsibilities related to the physical care of the child. They should first feed them and prepare breakfast. When the child comes to school without breakfast, then s/he buys junk food from the canteen (Selin- physical need)*
- *Students are late to my class. This is not the fault of the student, the parents do not wake up on time to send the child to school. They do not care and do not see it as a responsibility (Ilke- social need).*

Fulfillment of the physical and social responsibilities of parents is an important development of their children. Nutrition, hygiene, health etc. are basic needs. And these must be fulfilled, other responsibilities (educational, emotional... etc.) follow them. The educational responsibilities of parents are presented in Table 3.

Table 3

The Educational Responsibilities Parents Fail to Fulfill

	Unfulfilled Educational Responsibilities
Care	Providing educational materials
	Gaining the skills and habit of studying
	Gaining the habit of reading books
	Not expecting everything from the teacher
	Getting a sourcebook
	Being a role model
	Sending to kindergarten
Control	Ensuring that the child brings the relevant school materials to school
	Ensuring that the child is not late to the school
	Ensuring school attendance
	Checking their homework
	Tracking their notes
	Questioning the education children received
	Using e-school
Motivate	Encouraging the child to go to school
	Setting goals for the child
	Ensuring that the child sees the school as a home

As seen in Table 3, the responsibilities were categorized as a responsibility to care, control and motivate. A quotation was provided under each category. Quotations related to the responsibility to care, control, motivate;

- *Parents should care about their children. This could be related to their courses or the problems of the child. However, it is often the mothers who care about children. Fathers use the excuse that they are working, and they avoid responsibility (Ahmet-care).*
- *Firstly, the student should be enthusiastic and prepared to come to school. This is something up to the parent. If the parent is not paying attention to the school then the student is also not very enthusiastic about it. Parents should motivate them at home to go to school (Ece- motivate).*

Care, control and motivation are important factors in students' education. If one or more of these are missing, there will be some problems. For example, if the student has got all of the educational material, but the parent is inattentive and does not motivate the student, the learning and behavioral development of the student does not occur. In addition, parents also have emotional responsibilities. The emotional responsibilities of parents are presented in Table 4.

Table 4

The Emotional Responsibilities that Parents did not Fulfill

	Unfulfilled Emotional Responsibilities
Communication	Forming an emotional bond
	Chatting
	Being a role model
	Sharing student's problem
Monitoring	Monitoring the psychological development
	Monitoring the friendships that the child has established
Teaching Values	Teaching to be respectful Teaching to be polite Showing love, affection and interest Teaching to take Responsibility
Avoiding violence	Not shouting or scolding
	Not applying psychological violence
	Ensuring that the child does not see the father only as an authority figure
Spending time with the child	Spending time especially with the father Doing housework together
	Physical contact with parents such as kissing and hugging Spending quality time with parents Allocating time to do something with the child

When Table 4, the emotional responsibilities of parents were listed as communication, monitoring, and spending time together and quotations were provided under each category. Quotations related to communication, monitoring, violence, values, spending time together;

- *They should monitor their children. I have had students who took up bad habits and dropped out of school. They take their fathers or brothers as role models and some of these kids are in prison now. There should be a monitoring system (Ertan-monitoring).*
- *The parent should have emotional responsibility; the child should share the school experiences with parents. There should be such a dialogue. When the child comes home, s/he should tell what happened at school. Parents should also spend time with their kids. It is not only about feeding and dressing them (Selda- spending time together).*

Emotional needs (chatting with the child, sharing his/her problems, spending time with him/her etc) are very important for the development of the children. The

children who feel valued will strive to succeed and show good behavior. Families who want their children to be successful and character should give importance to their children's emotional needs. They should fulfill their responsibilities. But in this study, the families did not fulfill them.

The Reasons Why Parents do not Fulfill Their Responsibilities

The reasons for unfulfilled responsibilities can be listed as an economic, personality of the parent and family-related reasons. These are presented in Table 5.

Table 5

Reasons for Unfulfilled Responsibilities (Economic)

	Economic Reasons for Unfulfilled Responsibilities
Attitudes towards the children	Having many children with the idea that they will work and contribute to family subsistence Expecting that the child will take care of the family when parents are old.
Unemployment	Unemployment The lack of a stable/regular job Lack of financial security to meet needs Financial difficulties Occasional or seasonal jobs Not being able to afford heating Not being able to take the child to doctor due to financial difficulties

As seen in Table 5, the economic reasons included their attitudes toward children and unemployment. Quotations related to unemployment, parents' attitudes towards the children,

- *I am working for 50 liras per day. Then I am trying to pay the debts of my husband. How can I pay attention to my children? (Ertan- unemployment).*
- *Crowded family...minimum 4 children. Some families even have 10 kids and they never give up. They want to have more children so that they can look after their parents in the future (Ece- attitudes towards the children).*

Parents were not interested in their children due to economic inadequacies and poverty. They did not want to deal with the needs of their children when they came home. Because they were thinking about economic problems. Another reason why parents did not fulfill their responsibilities was related to their personality. This could be categorized as behaviour and personality and included illiteracy and the lack of knowledge. Table 6 presents the personality-related reasons.

Table 6

The Reasons for Unfulfilled Responsibilities (Personality of Parents)

	Reasons for Unfulfilled Responsibilities
Lack of Knowledge	Illiteracy
	Not knowing the home-cooking-nutrition culture
	The idea that packed food is healthy
	Not having sufficient knowledge of raising human
	Not being open to change and new things
	Commitment to Eastern Culture
	Insufficient level of education to help children
	Not having sufficient knowledge of the education system
	Not being able to understand the psychology of the child
	Rude and violent family structure
Personality	Ignorant and careless personality
	Being a bad role model (if a family member is in prison)
	Too much time spend in coffeehouses by fathers in the evening
	Lack of communication with the father
	Not making any effort to communicate with the child
	Not waking up in the morning to prepare children for the school
	Fathers' lack of sharing the responsibility with mother regarding childcare
	Not having enough time to care for children
	Expecting everything from the state
	No/low expectations from the child
	Lying

Table 6 lists the items related to a lack of knowledge and personality. Some quotations were provided below. Quotations related to personality, lack of knowledge;

- *Some children are always late at my school. This is not the fault of the children. The parent should wake up and send the child to school on time...They do not care (Emre- personality).*
- *They are not paying attention to anything related to education. Even if they want to, they do not know what to do at home. Some mothers are illiterate. Their husbands work at construction fields during the day and spend the evening in*

coffeehouses. No one pays attention to the education of the child (Ertan -lack of knowledge).

Parents with inattentive personalities who did not have the knowledge to help their child's homework were also not interested in their children's responsibilities. The third reason why parents did not fulfill their responsibilities. These are presented in Table 7.

Table 7

The Reasons for Unfulfilled Responsibilities (Family-Related)

		Family-Related Reasons for Unfulfilled Responsibilities
Indoor	The structure of the house	The house is not suitable for the child (room, table and bed)
		Small house
		The idea of encouraging the child to spend time outside the house to decrease the population of the house
	Family structure	Extended family (grandparents, relatives)
		Family structure with many children
		Spending free time by watching TV or chatting with relatives
		Not having the culture of breakfast
Outdoor	Migration	Migrating from Eastern Turkey
		Lack of belonging to the city they live in
		Cultural differences

Table 7 lists the family-related reasons and some quotations were provided below. The quotations related to the causes arising from home, arising from the issues concerning the life outside the home;

- *Parents raised in Eastern Culture do not show love and affection to their children. They shout at their children (Selin- arising from the issues concerning the life outside the home).*

Indoor and outdoor are also important factors in fulfilling their responsibilities. For example, if the house is small, the children haven't got a special room and the relatives are living in the same house, the whole family sits and talks only a room, these are important factors. The mother has housework as cooking, cleaning, looking after the babies etc., the father spends the time with the relatives. Thus, they don't fulfill their responsibilities. These situations don't disturb them. The suggestions to encourage families to fulfill their responsibilities are categorized as the actions that need to be taken by teachers and the state. These are presented in Tables 8 and 9.

Table 8

Recommendations (State)

	Recommendations that Need to be Implemented
Collaboration with other Institutions	Conducting special projects in this region Television/media/TRT/public spot emphasizing the importance of parental responsibilities Description of the responsibilities of parents of parents on Friday preaches by imams Training of parents Maternity-parenting training before becoming a parent Ensuring that all parents learn to read and write Preventing early/child marriage Establishing a youth center Increasing state aid to the family (firewood, clothing, food etc.) Ensuring that the TV series reflects a proper family life
Ministry of National Education	Free breakfast Providing parenting training Ensuring that especially fathers take this training Provide legal text Organising literacy courses Organising activities that could increase parents' self-confidence Appreciating what parents do Rewarding parents for what they do Working together with parents and gathering parents for meetings

As seen in Table 8, suggestions can focus on collaboration with institutions and the Ministry of National Education. Some quotations were provided below.

- *Education is a must. Every parent should adhere to their responsibilities and they should be trained on how to perform these. There are so many people marrying at an early age. Although we ignore it, there are girls who became mothers at the age of 15 (Ece).*
- *Parents should get frequent training. Parents performing their responsibilities should be supported financially. Mechanisms that could increase self-confidence and appreciate their efforts should be introduced to encourage other parents (Selda).*

The teachers said that it must work with other institutions. For example, television channels should emphasize parental responsibilities with public spots. Imams should talk about parental responsibilities at Friday preaches. Ministry of National Education should give free breakfast, train the parents some subjects etc. Other recommendations are communication and guidance. The actions that need to be taken by teachers to encourage parents to perform their responsibilities are presented in Table 9.

Table 9

Recommendations (Teachers)

	Recommendations that Need to be Implemented
Communication	Visiting parents at home
	Increasing one-to-one meetings
	Meeting with parents outside the school
	Communicating with parents
	Inviting parent to the classroom and ensuring parent-child interaction (reading a book together)
	The increasing number of a parent-teacher meeting
	Reminding parents about their responsibilities
	Increasing the communication on WhatsApp messages
	Monitoring parents to see if they are using what they have learned in parenting training
Guidance	Ensuring parents' active use of e-school Teaching parents how to mark what they have read in e-school as 'read' Collaborating with psychological guidance service Regular control of students' hygiene in the morning

Table 9 shows that actions that need to be taken by teachers focus on communication and guidance. Quotations related to this were presented below:

- *We are visiting parents at home and we have WhatsApp groups. It is necessary to see the parents in person and inform them about their responsibilities. I prepared documents for parents explaining how they should treat their children (Ahmet).*
- *I think parents should be trained. It should not be a simple but comprehensive one like literacy project. This course should include modules on the exam, reasons for underachievement of the children, responsibilities of parents etc. (Ertan).*

Home visits, calling the parents, sending messages etc. are important factors. Parent-school collaborations are effective for the development of the child. Parents should be contacted and guided because parents may need guidance, counseling and training. Children's development and success depend hugely on their families. If the parents receive support for the children, it may be beneficial for their children.

Conclusion, Discussion and Recommendations

The findings show that parents did not fulfill their responsibilities at the Migration Primary School where this study was conducted. These responsibilities were categorized as physical, educational and emotional responsibilities. Parents did not fulfill their physical responsibilities such as nourishment, health, development,

security; and in terms of social responsibilities, they did not discipline their children or show love and affection. Teachers provided the following examples of the responsibilities as not being performed by parents: Students usually came to school without having any breakfast; parents thought that the processed food in the canteen was healthy; children's uniforms or dresses were not clean and they did not develop any hygiene habits; children were not being taken to school when they were sick, parents did not monitor physical development of their parents, children were exposed to violence and did not receive any love and affection or any discipline training.

Hornby (2000) listed several items that teachers want parents to perform. Parents should meet health needs of their children, should be committed to the discipline rules set in the school, help children with their homework, do some voluntary work at school, read the reports and letters sent to home and respond to them, support their children, attend parents-teachers meetings and provide their contact details to school in case of an emergency. All these cover the basic responsibilities of parents.

The parents also did not fulfill their educational responsibilities which included caring, controlling and motivating. They did not really pay attention to the children's academic work at school, did not help them gain the habits of studying and reading a book. Although children attended school, they were usually late in the morning, came to school without having anything to eat. Parents also did not use the e-school system, did not send their kids to kindergarten, and did not motivate their children to go to school and did not set goals for them.

The children display positive changes to the extent the parents perform their responsibilities and values their children. According to Berger (1991), the student's development at school is related to the value family attaches to education. Therefore, families should collaborate with schools. When the parents do not pay attention to their kids and do not perform their responsibilities, students' achievement is negatively affected. The research of Celenk (2003) shows that the collaboration between parents and school increases the academic achievement of the children. Kocak (1991) stated parents did not want to support or visit the school because they were either extremely busy or wanted to avoid hearing any negative comments about their children. Ensuring the collaboration between school and family is the responsibility of both parents and schools. This is because this collaboration will only be beneficial for the children and the education system (Kiral, 2017a). The collaboration with schools and participating in school events are important for the educational development of the child.

The research of Orman (2012) showed that the frequency of parents' participation in parent-teacher meetings depend on the number of children they have, and more children have a fewer meeting they participate. In low socio-economic families, the lack of opportunities also increases as the number of children increases within the family, which makes it difficult for parents to meet the needs of their children, including educational needs. Balci (1993) argues that the participation

of families in school events increases the academic achievement of students and the efficiency of schools and thus plays a complementary and supportive role.

The collaboration between school and family is necessary to increase students' achievement and prepare them for real-life (Aslanargun, 2007; Muller, 2018). Some studies about collaboration showed positive effects of education (Shpancer, 1998; Swartz & Easterbrooks, 2014). The children who come from families with a high sense of parental responsibilities achieve higher than the families who do not care about their children (Eipstein & Connors, 1995; Eipstein & Sanders, 2002, 2006). It is important to understand how parents position their children in their education. If parents see themselves as agents who only serve the needs of their children, they will not be participating in school facilities. Thus, they will ignore their responsibilities and these issues are mostly seen in low socio-economic families. These families think that the meetings at schools are not helpful and they are indeed a loss of time. In addition, families' working hours or unemployment may affect participation. Families with low cultural and economic capital, low socio-economic families, or parents from ethnic minority groups participate less in the meetings. Likewise, fathers are also reluctant about participating in school meetings (Clark, 1983; Fan & Chen, 2001; Hoover-Demsey, 1997; Hornby, 2000; Hornby & Lafaele, 2011).

The last set of responsibilities families failed to fulfill was the emotional responsibilities. The study showed that parents did not spend time with their children, did not pay attention to the problems of their children, did not ask what they had done with their friends at school, and the only time they spent with their children was dinner time. The study further displayed that parents did not show love and respect to their children, yelled at them, applied physical violence, and they did not have anger-management.

The study of Kiral (2017b) with the last year students of primary education teaching identified the responsibilities of parents as meeting discipline, entertainment and emotional needs of children. The observation of last year's students showed that when families do not meet any of these needs and responsibilities, it bears negative consequences for children.

This study showed that parents could not meet their responsibilities because of economic and familial reasons. Economic reasons can be categorized as the attitudes towards the child and employment. The attitudes towards children are often based on the idea that children are important for the continuation of the family; children will look after their parents when they are old and will contribute to family subsistence by starting to work after primary school. There is no expectation that the child will show academic achievement. Unemployment related reasons included financial difficulties due to working in casual jobs and daily jobs, and not being able to meet educational and other needs of students due to financial problems. This also involved a lack of nourishment or not being able to buy food and financial difficulty.

Another reason for the research why parents did not perform their responsibilities were related to the personality of parents and lack of knowledge. Parents may be ignorant or dominant and some parents do not have literacy skills

and cannot help their children with regard to schoolwork. Some parents also thought that the processed and packaged food in markers were healthy and did not have sufficient knowledge in how to raise kids. They were also too loyal to their own culture. However, they did not see a problem in how they bring up their children as they were also raised in a similar way and forced to marry at an early age. They did not know how to raise up the child exactly. Waking up early was another reason. They did not want to wake up early in the morning to prepare breakfast for their children. Meanwhile, fathers took fewer responsibilities and left all child care and responsibilities to mothers. They rarely communicated with their children and did not share much emotionally.

Family-related reasons can be categorised as causes concerning the life inside the home and outside the home. The causes concerning life inside the home are crowded and extended families. Families usually share their homes with elder members of the family, uncles and/or aunts. They have at least four children, which makes it difficult to fit in the house. In such a situation, children do not have a room, a desk to study or a bed to sleep. Families also do not feel belonging to the city they live as they migrate from elsewhere and feel trapped between the culture they come from and the culture they live in.

The parent also undertakes the education responsibility of the child by supporting the education provided by the school or by motivating the child to learn. Behaviours such as helping with homework, reading with the child, and using different educational activities are indications that the family is involved in the child's education at home (Kohl et al., 2000). In modern education, the parents' role is not only limited to sending their children to school but also ensuring that they are also part of the education system (Epstein, 2013). The parents should be aware of the way school operates (Epstein, 1995; Nayir, 2019). They should participate in the social and cultural activities organised by the school and strengthen the school-environment interaction (Kiral, 2008; Kuscu, 2012). Quiocho and Daoud (2006), in a study conducted on parents, state that the parents are also responsible for poor performance at the school, and that families with low education levels do not provide educational support to their children. So, families can also be a barrier for schools.

In education, the school and home environment are inseparable and affect each other. If families understand the importance of the home environment for school, then they may take more responsibility to support their children's schooling (Sui-Chu & Willms, 1996). With this awareness, families will work in cooperation with the school and will try to create appropriate learning environments at home and work together with teachers to make common decisions about their children's education (Epstein & Sanders, 2006). The direct participation of the family in education both inside and outside the school includes how much the family helps the child's homework, and how the parents' value judgments align with the school values (Dimock, Donoghue & Robb, 1996). The problem of time allocation is another factor that prevents school relationships. Especially working parents do not have enough time to cooperate with the school. In addition, many school-family meetings

transform the school into a meeting where they demand money from parents. This discourages the participation of parents who cannot afford it (Finders & Lewis, 1994; Hornby, 1995). In cases where parents cannot come to school, teachers could visit parents at home. With the common understanding based on cooperation, the education of the student should also continue at home. Parents and students should feel they are being valued (Kiral & Ocak, 2016). Sheldon and Jung (2018) found their research that home visits were greatly beneficial for every student. Teachers should get contact to get both an idea about the effect of family structure on student outcomes and an accurate sense of family structures as they exist in society (Lee, 2018).

Celik (2005), in his study investigating the problems experienced in school-family relations, defines the problems of school-family relations according to the opinions of teachers and parents. The research showed that parents were not interested in the social and emotional behaviours of children and they did not want to accept the problems of the children. For the learning to be effective, teachers and parents should fulfill their duties and responsibilities towards their children (Eroglu, 2008). Low social and education region, negative attitudes of the family to support the school-parent cooperation and student and low-income, limited family time are the negative factors affecting the cooperation. The other factors that affect the cooperation are the belief that parents do not have the potential to cooperate with the school because of their low level of education; parents' negative attitudes towards the school, parents' lack of time for school work, and widespread belief that parents are seen as a source of money (Kaya, 2012). As seen, parents' fulfillment of their responsibilities and their cooperation with the school is important for the development of the child.

This research also asked participants what could be done to help families fulfill their responsibilities and the respondents indicated suggestions that concern the state and teachers. The state should provide trainings, increase the financial support provided to families during winter, give free breakfast/meals at schools, open training courses on parental responsibilities before couples become parents and monitor the progress of parents, organise home visits and meet parents in spaces other than schools, establish youth centers, ask imams to deliver preaches on the importance of parental responsibilities on Fridays, provide free literacy courses, ensure that parents receive some sort of reinforcement after the training to motivate them, prevent child marriages, and broadcast public service advertisements on parenthood to increase the awareness among the public. Teachers' responsibilities are expressed as providing information to parents and the general public about parental responsibilities. The state should provide free transport to the school, job opportunities for unemployed parents should be increased, and the social state understanding should be used more.

In addition to the suggestions presented above, quantitative research methods can be used to conduct this research with the same sample. Such research can produce more generalizable results. The same research could be carried out in schools with low and high socio-economic students or private schools and public

schools to make comparisons. The European Union (EU) projects, Southern Aegean Development Agency (GEKA) or Scientific and Technological Research Council of Turkey (TUBITAK) projects can be used to support these communities' social mobility and to organise facilities that will help them feel important. The Ministry of National Education could provide more support to the schools in these districts.

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Velilerin Çocuklarına Karşı Sorumluluklarına İlişkin Bir Durum Çalışması

Atıf:

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Özet

Problem durumu: Eğitimde öğretmen-öğrenci-veli işbirliğinin kurulması özelde çocukların, genelde ise okulların ve eğitim sisteminin ve en geniş anlamda da devletlerin iyiliği için gereklidir. Bu üçlü saç ayağından oluşan işbirliğinde velilere büyük görevler düşmektedir. Kimlerin veli olabileceğine ilişkin Türk eğitim sistemindeki mevzuat incelendiğinde; velinin, okula devam eden öğrencinin sorumluluğunu üstlenen aile ya da aile dışında kişiler olabileceği belirtilmektedir.

Veli olan kişilerin bir takım sorumlulukları vardır. Her evli ebeveyn çocuklarının doğumuyla birlikte otomatik olarak bir takım sorumluluklar kazanmaktadır (Hall, 1999; Lowe, 2005). Bu sorumluluklar çocuğun ölümü veya ebeveynlerin boşanması ile; velayetin verilmediği ebeveynin ve/veya ebeveynlerden birisinin ölümü ile kaybedilmektedir (Lowe, 2005). Velilerin yükümlülükleri çocuğun yetiştirilmesi ile ilgili her şeyi içermektedir. Çocuğun yaşamı ile ilgili tüm kararlar, yaşayacağı ortam, hangi okula gideceği, hangi tıbbi tedaviyi görmesi gerektiği veya tedavinin reddedilmesi gerektiği gibi sorumluluklar da bunun içerisindedir (Henricson, 2008; Moyo, 2014). Bunun yanı sıra velilerin çocuklarına karşı, onların gelişimine yönelik sorumlulukları da olup, çocuklarının karakter ve yetenek gelişiminde, kültürel ve

toplumsal kuralları öğrenmelerinde önemli rolleri ve görevleri vardır (Dethloff, 2005). Sayılanların dışında ailelerin okulla ilgili faaliyetlerde görev almaları da sorumlulukları arasındadır. Öyle ki ailelerin okulla ilgili faaliyetlerde görev almaları, çocuğun topluma kazandırılmasında, akademik başarısının artmasında oldukça etkilidir. Bu sebeple ailelerle/velilerle olan iletişim kanalları sürekli açık tutulmalıdır. Bu iletişim kanalları arasında veli ve öğretmenlerin birebir görüşmeleri, veli toplantıları, telefon görüşmeleri, mailler, WhatsApp mesajları, mektuplar ve ev ziyaretleri sayılabilir (Kıral, 2017a). Bu iletişim kanallarının kullanılması ile velilere, çocukları hakkında sürekli bilgi aktarılarak, sorumlulukları da hatırlatılabilir. Görüldüğü gibi velilerin çocukları üzerinde bir takım sorumlulukları vardır. Bunların bilinmesinin ise önce çocuğa, ardından eğitim sistemine fayda sağlayacaktır. Yapılan araştırmalar incelendiğinde Türkiye'de bu konuda yeterli araştırmanın olmadığı görülmüştür.

Araştırmanın Amacı: Velilerin çocuklarına karşı yerine getirmedikleri sorumluluklarını araştırmak amaçlanmıştır. Bu amaçtan yola çıkarak aşağıdaki sorulara yanıt aranmıştır.

Sınıf öğretmenlerinin görüşlerine göre;

1. Velilerin yerine getirmedikleri sorumlulukları nelerdir?

2. Velilerin sorumluluklarını yerine getirmeme nedenleri nelerdir?

3. Velilerin sorumluluklarını yerine getirmeleri için yapılması gerekenlere ilişkin önerileri nelerdir?

Araştırmanın Yöntemi: Araştırma nitel araştırma desenlerinden birisi olan durum çalışması ile desenlenmiştir. Mevcut durumun ortaya çıkarılmasını amaçlayan bu araştırma betimsel durum çalışması deseninde yürütülmüştür. Durum çalışması gerçek yaşamdaki var olan, güncel durumların çalışılmasını, betimlenmesini ve ortaya konulmasını amaçlayan çalışmalardır (Creswell, 2016). Araştırma 2018-2019 akademik yılı birinci yarıyılında Aydın ili Efeler ilçesinde bir ilkokulda görev yapan gönüllü sınıf öğretmenleriyle gerçekleştirilmiştir. Katılımcılar Göç İlkokulundan amaçlı örnekleme yöntemlerinden olan ölçüt örnekleme yöntemine göre seçilmişlerdir. Öğretmenleri tercih etmedeki ölçüt en az 10 yıllık mesleki kıdem ve Göç İlkokulunda en az 5 yıllık hizmetlerinin olmasıdır. Çünkü çalışılan okulun veli profilinin anlaşılması için göç ilkokulunda uzun süre çalışmış olmaları ölçüt olarak alınmıştır. Araştırmaya 9 sınıf öğretmeni katılmıştır. Araştırmada veriler yarı yapılandırılmış görüşme formu ile toplanmıştır. Araştırmada güvenirliği sağlamak için Miles ve Huberman (1994) formülünden yararlanılmıştır. Bu çalışma hesaplanan oran % 88 olup; araştırmanın güvenilir olduğu söylenebilir. Araştırmada içerik analizi kullanılmış, doğrudan alıntılar yapılmış, etik unsurlara dikkat edilerek katılımcılara kod ad verilerek çalışmada kullanılmıştır.

Araştırmanın Sonuçları ve Önerileri: Araştırma sonuçlarına göre göç ilkokulundaki velilerin sorumluluklarını yeterince yerine getirmedikleri tespit edilmiştir. Velilerin yerine getirmedikleri sorumluluklar yetiştirme, öğretimsel ve duygusal sorumluluklar olarak sınıflandırılmıştır. Velilerin yerine getirmedikleri yetiştirme

sorumlulukları arasında bedensel olarak beslenme, temizlik, sağlık, gelişim ve güvenlik sorumluluklarının karşılanmadığı gibi bulgularına ulaşılmıştır. Sosyal olarak yerine getirilmeyen sorumluluklar ise ilgi ve disiplin olarak ikiye ayrılmıştır. Yerine getirilmeyen bu sorumluluklara örnek olarak; çocukların okula kahvaltı yapmadan gelmeleri, kantindeki hazır gıdaların veliler tarafından iyi gıdalar olarak değerlendirilmesi, kılık kıyafet yönünden temiz olmamaları, veliler tarafından çocuklarının fiziksel gelişiminin takip edilmemesi, evin kalabalık olması sebebiyle akrabalar tarafından veya baba tarafından çocukların şiddet görmeleri vb. öğretmenler tarafından ifade edilmiştir.

Velilerin yerine getirmedikleri sorumluluklarından bir diğeri öğretimsel sorumluluklarıdır. Bunlar da ilgilenme, kontrol ve güdüleme olarak sınıflandırılmıştır. Araştırma sonunda, velilerin çocuklarının dersleri ile ilgilenmedikleri, ders çalışma, kitap okuma gibi alışkanlıkları kazandırmadıkları, okula devamlarını sağladıkları fakat sabah çocukların derse geç kaldığı ve kahvaltı yapmadan okula geldikleri, e-okul sistemini kullanmadıkları, çocuklarını ana sınıfına göndermedikleri, çocukların okula eksik materyalle gittiği ve çantalarında programa göre ders materyali, araç-gerecinin olmadığı, çocukların okula ve derslere karşı güdülenmedikleri ve çocukların eğitime, geleceğe dair amaçlarının olmadığı ve velilerin onlara amaç oluşturmadığı tespit edilmiştir.

Velilerin yerine getirmedikleri sorumluluklarından sonuncusu ise duygusal sorumluluklarıdır. Velilerin çocukları ile sohbet etmedikleri, ders veya çocukların diğer sorunlarını sorgulamadıkları, arkadaşlarını veya okulda ve mahallede yaptıklarını sormadıkları, paylaşımda bulunmadıkları, çocukları ile vakit geçirmedikleri, geçirdikleri vaktin zorunlu yemek vakitleri olduğu, çocukla birlikte özel bir paylaşımda bulunmadıkları, sevgi ve saygı, sorumluluk gibi değerleri aşılayamadıkları, çocuklara bağırma ile iş yaptırdıkları, çocuklara psikolojik şiddet uyguladıkları vb gibi sonuçlara ulaşılmıştır. Velilerin sorumluluklarını yerine getirmeme nedenlerinin tespit edildiği bu araştırma sonuçlarına göre veliler ekonomik, veli kaynaklı ve ailevi nedenlerden ötürü sorumluluklarını yerine getirmemektedirler.

Yapılan bu çalışmada ayrıca katılımcılara velilerin sorumluluklarını yerine getirmeleri için neler yapılması gerektiği sorulmuş ve katılımcıların verdiği cevaplar neticesinde öneriler; devletin ve öğretmenlerin yapacakları faaliyetler olarak iki kategoriye ayrılmıştır. Devletin yapacakları arasında aileye yapılan yardımları özellikle kış mevsiminde artırmak, ücretsiz kahvaltı vermek, anne-baba olmadan evvel her bireye annelik-babalık eğitimi vermek, velilere çeşitli eğitimler vermek ve bu eğitimleri kullanıp kullanmadıklarını kontrol etmek, ev ziyaretleri ve bire bir görüşmeler yapmak, okul dışı farklı mekânlarda velilerle görüşmelerde bulunmak, gençlik merkezleri açmak, cami imamlarının farklı zamanlarda ve özellikle de cuma günleri velilerin sorumluluklarına ilişkin hutbeler vermesini sağlamak, okuma-yazma kursları açmak, verilen eğitimler ve kurslar sonunda mutlaka bir belge veya çeşitli ödüllendirmeler yapmak, erken evlenmenin önüne geçmek için çalışmalar başlatmak, taziye evlerini boşken eğitim merkezleri olarak kullanmak, televizyon kanallarında dizi ve program aralarında küçük reklamlar, kamu spotları ile velilerin

yerine getirmeleri gereken sorumlulukları, annelik-babalık ile ilgili bilgileri halkla paylaşmak gibi öneriler geliştirilmiştir.

Geliştirilen bu önerilerin dışında aynı araştırma benzer örneklem gruplarında nicel araştırma yöntemi kullanılarak araştırılabilir, sonuçlar genellenebilir ve devlet ortaya çıkan sorunlara topyekün bir önlem alabilir. Aynı araştırma sosyo-ekonomik düzeyi yüksek ve düşük bir okulda yapılarak velilerin yerine getirdikleri ve getirmedikleri sorumluluklarını kıyaslanabilir. Bu bölgelere yönelik yapılacak Avrupa Birliği, Türkiye Bilimsel ve Teknolojik Araştırma Kurumu veya diğer kurum ve kuruluşlar tarafından projeler yapılabilir. Destekli projelerin sayıları artırılarak bu bölge insanının dışa açılması, yenilikleri görmesi, kendini önemli ve özel hissetmesi sağlanabilir. Projeler vasıtasıyla elde edilen gelir ile söz konusu okullara kaynak sağlanması için çeşitli çalışmalar başlatılabilir.

Anahtar Kelimeler: İlkokul, sorumluluk, sınıf öğretmeni, anne-baba, veli sorumlulukları.

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Motivation, Self-Efficacy and Attitude as Predictors of Burnout in Musical Instrument Education in Fine Arts High Schools

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ABSTRACT

Purpose: This study aims to investigate fine arts high school students' motivation toward musical instrument education, musical instrument performance self-efficacy beliefs and attitudes as predictors of burnout. In this study, fine arts high school students' levels of, and the relationships among motivation toward musical instrument education, their musical instrument performance self-efficacy beliefs, attitudes, and burnout were investigated.

Research Methods: This study was designed as a predictor relational survey study and conducted with a total of 401 fine arts high school students during the 2015-2016 academic year.

Findings: The results revealed that students' burnout levels were low, their motivation level was high, their level of musical instrument performance self-efficacy beliefs was middle, and their attitude level was high. The results also showed a negative significant relationship between students' motivation toward instrument education, their musical instrument performance self-efficacy beliefs, attitudes, and burnout. The fine arts high school students' motivation toward instrument education, their musical instrument performance self-efficacy beliefs, and attitudes were found to be significant predictors for their burnout.

Implications for Research and Practice: The researchers in this study recommend that further studies should be conducted to determine the predictive power of other affective variables on student burnout levels to provide new insights into the literature. Given that existing Turkish literature in the field of burnout in music education has mostly focused on music teachers and preservice music teachers, burnout among music education students among different institutions is an area that demands further investigation.

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Introduction

Music education is a significant aspect of human life and education, a point that many writers, philosophers, and educators have provided and highlighted throughout history. Some examples of such statements and considerations are as follows: "We do not seem to educate an individual in all aspects without music" (Welch & Adams, 2003, p. 4); "Education through music is the most superior education because rhythm and harmony go deep into soul and make it coherent (Platon, 2005, p. 117; cited in Akbulut, 2006, p. 3); and "Music provides unique and invaluable insights into the human condition. Music allows us to know, discover, understand, experience, share, or express such aspects of the human condition as feelings, aesthetic experiences, the ineffable, thoughts, structure, time and space, self-knowledge, self-identity, group identity, and healing and wholeness" (Donald, 2005, p.111). According to Suzuki (Barrett, 1995), music is the most effective means by which to teach an individual across all aspects. Unlike learning a language or mathematics, individuals should be educated in all aspects and emotions through music, and, most of all should be educated as such for civilization.

Music education is significant in the educational life of individuals; it can be provided through several means, including vocational, general and volunteer music education. Vocational music education is provided so that individuals can better understand music through the acquisition of musical knowledge, skills, and habits required by particular occupations or branches of music (Ucan, 2005). Vocational music education in Turkey is provided in conservatories, fine arts high schools, education faculties' musical education departments, and faculties of fine arts. Among these institutions, music education is provided at the primary, secondary, and university educational level in conservatories; at the secondary education level in fine arts high schools; and at the undergraduate educational level in departments of music education in faculties of education and the faculties of fine arts. These institutions include instrument education as an essential component of music education because instruments are one of the most basic materials necessary for music education. However, instrument education is a quite challenging process and requires intensive practice.

Reschly and Christenson (2006) highlight the cognitive and psychological dimensions of class participation within a lesson. Affective traits can also be listed among the dimensions of class participation in musical education lessons. Much like musical knowledge, affective traits are also cognitively stored. Hence, such affective traits influence learning in a positive or negative manner. Thus, strong and positive affective traits are needed so that students can carry out routine exercises in instrument education. Consciousness is the reflection of one's own being, and through such reflection, individuals become stronger both personally and cognitively. As the reflection of being—or, alternatively, reality—consciousness represents the practical relationship between the individual human and their own being or their experience with reality (Rubinstein, 1946; cited in Bull, 1968, p.32). Thus, human conscience includes not only that knowledge which meets and addresses their needs regarding the world but also their individual experiences. Affective traits, such as knowledge,

are stored in cognition. Thus, affective traits constitute an aspect of the learning process and influence learning in a positive or negative way. According to Akbulut (2000), "[in]most instances, individuals' positive affective traits positively influence both their cognitive characteristics and their psychomotor characteristics and behaviors" (p. 3). Therefore, negative affective traits can be said to be among the most important problems preventing an effective instrument education; consequently, continuous and intensive practice is required to avoid the challenges and problems that may serve to prevent students from attaining their necessary goals.

In Turkey, education faculties and their music departments are an example of music education providers. Herein, music teachers are critically important as they provide students with the possibility of benefiting from the positive effects of music itself. Music teachers play an important role in raising students who are actively interested in music. Music teachers, like teachers of all subjects, encounter students from different economic and social backgrounds in their occupational lives. While some students may be lucky enough to experience inspiring moments in their musical education outside of school and the classroom, others may be only being able to have such experiences in the school environment. For those students whose musical experiences are restricted to the classroom, music teachers play a key role in encouraging and motivating them to engage and excel. Musical instruments are among the most basic educational tools required for musical education; consequently, music teachers who are adept in their musical instruments or instruments of choice can play a significant role in encouraging their students to engage in music by creating a driving force. Consequently, music students can benefit considerably from music education. Therefore, it may be said that music education has an essential place in the music education department. However, students with negative affective traits stemming from certain negative experiences cannot be successful at the expected level in these departments. Breaking students' affective resistance can be a challenging task for teachers. Thus, determining the underlying reasons for students' negative affective background within music education departments can contribute to finding and implementing the necessary applications and programs within music education departments and thereby rectify the student's condition.

In considering the average profile of students within music education departments, it can be seen that the majority of enrolled students graduated from fine arts high schools. Consequently, determining common affective problems students encounter during their musical instrument education within these fine arts high schools will help to develop programs and applications to overcome challenges thereafter. Indeed, by intervening through these programs and applications, the affective problems students experience in their musical instrument education may be prevented from carrying over to their music education departments as the following stage of their fine arts high schools. The secured transition from fine arts high school to university music education can contribute to the improvement of achievement and quality regarding musical instrument education in fine arts high schools and music education departments, while also contributing to the promotion of qualified preservice music teachers. Accordingly, the present study aims to investigate the

predictive power of fine arts high school students' motivation toward musical instrument education, their musical instrument performance self-efficacy beliefs, and attitudes on their burnout. The study shall also investigate the levels of and the relationships among students' motivation toward musical instrument education, their musical instrument performance self-efficacy beliefs, attitudes, and burnout. The research questions for this study were formulated as follows:

1. What are fine arts high school students' levels of motivation toward musical instrument education, musical instrument performance self-efficacy beliefs, attitudes, and burnout?
2. What is the relationship among fine arts high school students' motivation toward musical instrument education, musical instrument performance self-efficacy beliefs, attitudes, and burnout?
3. What is the predictive power of fine arts high school students' motivation toward instrument education, musical instrument performance self-efficacy beliefs, and attitudes regarding their burnout levels?

Method

Research Design

This study used a survey design; survey studies describe specific characteristics of individuals, groups, or organizations (Berends, 2006, p. 623). Studies that attempt to predict one variable concerning another variable are called predictive relational survey studies (see Buyukozturk, Cakmak, Akgun, Karadeniz, & Demirel, 2012, p.226). This study aims to describe the predictive relationship between fine arts high school students' motivation in musical instrument education, musical instrument-performance self-efficacy beliefs, attitudes, and burnout. Data for this study were collated using a predictor relational survey method.

Research Sample

For this study, the researcher cooperated with 401 students enrolled in first, second, third and fourth years in fine arts high schools in Ağrı, Samsun İlkadım, Sivas Muzaffer Sarısözen, İstanbul Avni Akyol, Bursa Zeki Müren, İzmir Ümran Baradan and Gaziantep Ticaret Odası fine arts high school during the 2015-2016 academic year in Turkey. Of the students in this study, 33.7% were male, and 66. 3% were female. Of them, 16% were enrolled in their first year, 29,9% were in their second year, 23.4% were in their third year, and 30.7% were enrolled in their fourth year. Participants were selected using the simple random sampling technique.

Research Instruments

The Musical Instrument Performance Self-Efficacy Belief Scale

The Musical Instrument Performance Self-Efficacy Belief Scale was developed by Girgin (2015). Girgin (2015) determined the Cronbach's alpha value for the entire scale to be .72, and identified three sub-dimensions, namely, self-efficacy, self-inefficacy and psychological indicators; the Cronbach's alpha values for the scale's sub-dimensions are .86 for self-efficacy, .76 for self-inefficacy and .61 for psychological indicators**.** The scale was designed as a five-point Likert-type scale, and participants' scores for the scales' 20 items range from 1= "strongly disagree" to 5= "strongly agree." The Musical Instrument Performance Self-Efficacy Belief Scale includes 20 items; the highest and lowest possible scores are 100 and 20, respectively. A high score on the entire scale indicates a high-level of musical instrument performance self-efficacy belief.

The Motivation for Individual Instrument Classes Scale

The Motivation for Individual Instrument Classes Scale was developed by Girgin (2015). Girgin (2015) determined the Cronbach's alpha value for the entire scale to be .77 and identified three sub-dimensions, namely, lack of motivation, achievement motivation and motivation for studying. Cronbach's alpha values for the scale's sub-dimensions are .90 for lack of motivation, .88 for achievement motivation and .76 for motivation for studying. The scale was designed as a five-point Likert-type scale, and participant's scores range from 1= "strongly disagree" to 5= "strongly agree." The Motivation for Individual Instrument Classes Scale includes 25 items. Thus, the highest and lowest possible scores are 125 and 25, respectively. A high score for the entire scale indicates a high level of motivation for individual instrument classes.

The Burnout Scale for Individual Instrument Courses

The Burnout Scale for Individual Instrument Courses was developed by Girgin (2015). In developing the Scale, Girgin determined that it had a single-factor structure. The Cronbach's alpha value for the entire scale is .97. Participants' scores for items within this five-point Likert-type scale range from 1="strongly disagree" to 5="strongly agree." The Burnout Scale for Individual Instrument Courses includes 36 items. Thus, the highest and lowest possible scores are 180 and 36, respectively. A high score for the scale indicates a high level of burnout for individual instrument courses.

The Attitude Scale towards Instrument Education Lesson

The Attitude Scale towards Instrument Education Lesson was developed by Topoglu and Erden (2012). In developing the scale, Topoglu and Erden determined that the scale had a single-factor structure. Topoglu and Erden (2012) found the Cronbach's alpha value for the entire scale is .95. The items on this five-point Likert-type scale range from 1= "strongly disagree" to 5= "strongly agree." The Attitude Scale towards Instrument Education Lesson includes 27 items. The highest and lowest possible scores on the scale are 135 and 27, respectively. A high score for the scale indicates a high level of attitude towards instrument education lessons.

Data Analysis

Arithmetical and standard deviation values of participants' scores for each of the scales—the Burnout Scale for Individual Instrument Courses, the Motivation for Individual Instrument Classes Scale, the Musical Instrument Performance Self-Efficacy Belief Scale, and the Attitude Scale towards Instrument Education Lesson Scale were presented per a descriptive analysis. A correlation analysis was conducted to determine the relationship among participant burnout, motivation, musical instrument performance self-efficacy beliefs, attitudes, and burnout. A regression analysis was carried outto determine the predictive power of the participants' motivation, musical instrument performance self-efficacy beliefs, and attitudes regarding their burnout. The confidence level for this study was determined to be .05.

Results

This section includes the results of the statistical analyses. Descriptive statistics regarding the predicted variable, burnout, and the predictive variables, motivation, musical instrument performance self-efficacy belief, and attitude can be seen in Table 1. The relationship among these variables can be seen in Table 2 and the results of the regression analysis of the predictive variables can be seen in Table 3.

Descriptive Statistical Results

The results of the descriptive statistics regarding the data obtained by the Burnout Scale for Individual Instrument Courses, the Motivation for Individual Instrument Classes Scale, the Musical Instrument Performance Self-Efficacy Belief Scale, and the Attitude Scale towards Instrument Education Lesson are presented in Table 1.

Table 1

Descriptive Analysis Results of the Study Variables

	N	M	SD	Minimum	Maximum
BSIIC	401	1.752	0.914	1.000	4.940
MIICS	401	4.284	0.609	1.880	5.000
LM	401	4.514	0.721	1.300	5.000
AM	401	4.433	0.636	1.000	5.000
MS	401	3.526	0.875	1.000	5.000
MIPSBS	401	3.221	0.766	1.050	5.000
SE	401	3.042	0.977	1.000	5.000
SI	401	3.610	0.967	1.000	5.000
PI	401	3.188	0.877	1.000	5.000
ASIEL	401	4.018	0.724	1.330	4.850

Note: BSIIC, the Burnout Scale for Individual Instrument Courses; MIICS, the Motivation for Individual Instrument Classes Scale; LM, Lack of motivation; AM, Achievement Motivation; MS, Motivation for studying; MIPSBS, the Musical Instrument Performance Self-Efficacy Belief Scale; SE, Self-Efficacy; SI, Self-Inefficacy; PI, Psychological Indicators; ASIEL, the Attitude Scale towards Instrument Education Lesson

As can be seen in Table 1, participants' levels according to the entire scales and their respective sub-dimensions were found to be: low for Burnout (1.752±0.914); high for Motivation (4.284±0.609); low for Lack of Motivation (4.514±0.721); high for Achievement Motivation (4.433±0.636); high for Studying Motivation (3.526±0.875); middle for Musical Instrument Performance Self-Efficacy (3.221±0.766); middle for Self-Efficacy (3.042±0.977); low for Self-Inefficacy (3.610±0.967); middle for Psychological Indicators (3.188±0.877); and high for Attitude (4.018±0.724). The participants' levels of Lack of Motivation and Self-Inefficacy decreased as their scores on these dimensions increased since they consisted of reverse items.

Results from the Correlation Analysis

A correlation analysis was conducted using the study findings to investigate the relationship among the participants' motivation, musical instrument performance self-efficacy beliefs, attitudes, and burnout the related results are presented in Table 2.

Table 2

Correlation Analysis Results of the Study Variables

	1-BSIIC	2	3	4	5	6	7	8	9
2-MIICS	-.531**								
3-LM	-.734**	.871**							
4-AM	-.560**	.868**	.590**						
5-MS	-.518**	.787**	.528**	.598**					
6MIPSBS	-.531**	.522**	.442**	.499**	.509**				
7-SE	-.391**	.510**	.383**	.440**	.505**	.884**			
8-SI	-.543**	.494**	.460**	.343**	.466**	.853**	.599**		
9-PI	-.383**	.142**	.185**	.399**	.509**	.582**	.196**	.540**	
10-ASIEL	-.802**	.870**	.767**	.732**	.704**	.546**	.495**	.525**	.223**

*p<.01, **p<.05

Note: BSIIC, the Burnout Scale for Individual Instrument Courses; MIICS, the Motivation for Individual Instrument Classes Scale; LM, Lack of motivation; AM, Achievement Motivation; MS, Motivation for studying; MIPSBS, the Musical Instrument Performance Self-Efficacy Belief Scale; SE, Self-Efficacy; SI, Self-Inefficacy; PI, Psychological Indicators; ASIEL, the Attitude Scale towards Instrument Education Lesson

As can be seen from Table 2, the highest correlations within each scale and among the scales' sub-dimensions were between general motivation and lack of motivation for the Motivation for Individual Instrument Classes Scale (r=.871; p<.05); general musical instrument performance self-efficacy belief and Self-Efficacy in the Musical Instrument Performance Self-Efficacy Belief Scale (r=.884; p<.05); Lack of motivation and general burnout between the Burnout Scale for Individual Instrument Courses and the Motivation for Individual Instrument Classes Scale (r=-.734; p<.05); general burnout and general musical instrument performance self-efficacy belief between the Burnout Scale for Individual Instrument Courses and the Musical Instrument Performance Self-Efficacy Belief Scale (r=-.531; p<.05); the Burnout Scale for Individual Instrument

Courses and the Attitude Scale towards Instrument Education Lesson (r=-.802; p<.05); general motivation and general musical instrument performance self-efficacy belief between the Motivation for Individual Instrument Classes Scale and the Musical Instrument Performance Self-Efficacy Belief Scale (r= 522; p<.05); general motivation and general attitude between the Motivation for Individual Instrument Classes Scale and the Attitude Scale towards Instrument Education Lesson (r=.870; p<.05); and general musical instrument performance self-efficacy belief and general attitude between the Musical Instrument Performance Self-Efficacy Belief Scale and the Attitude Scale towards Instrument Education Lesson (r=.546; p<.05).

Results Regarding the Regression Analysis

A multiple regression analysis was conducted on the predictive power of the participants' musical instrument education motivation, their musical instrument performance self-efficacy beliefs, students' attitudes on their burnout, and the related results are presented in Table 3.

Table 3

Regression Analysis Results of the Study Variables

Dependent Variable	Independent Variable	ß	t	p	F	Model (p)	R^2
BSIIC	Constant	6.166	31.708	0.000	254.486	0.000*	0.650
	MIICS	-0.160	-1.550	0.046			
	MIPSBS	-0.150	-3.573	0.000			
	ASIEL	-0.808	-10.484	0.000			

*p<.05

Note: BSIIC, the Burnout Scale for Individual Instrument Courses; MIICS, the Motivation for Individual Instrument Classes Scale; MIPSBS, the Musical Instrument Performance Self-Efficacy Belief Scale; ASIEL, the Attitude Scale towards Instrument Education Lesson

As seen in Table 3, participants' scores on the Motivation for Individual Instrument Classes Scale, the Musical Instrument Performance Self-Efficacy Belief Scale, and the Attitude Scale towards Instrument Education Lesson were found to significantly predict their scores on the Burnout Scale for Individual Instrument Courses (F=254.486; p=<.05). Results from the regression analysis suggest that the participants' motivation, musical instrument-performance self-efficacy beliefs, and attitudes regarding instrument education are significant predictors of students' burnout level (R^2=0.650). Fine art students' burnout levels decreased as their motivation (ß=-0.160), musical instrument performance self-efficacy (ß=-0.150), or attitude (ß=-0.808) increased.

Discussion, Conclusion and Recommendations

The results of this study are discussed in this section. This study revealed that regarding their instrument education, fine art students' burnout levels are low; their motivation level is high, their musical instrument performance self-efficacy level is middle, and their attitude level is high. It is noteworthy that participants' self-efficacy beliefs are at a mid-level as self-efficacy beliefs are one of the driving structures behind individuals' actions (Kurt, 2012). Individuals with low self-efficacy are unable to apply themselves to the learning processes, have a low level of enthusiasm regarding learning, are unwilling to face the difficulties they encounter and do not put effort into overcoming such difficulties (Bandura, 1993). Compared to individuals with low self-efficacy beliefs, students with high self-efficacy beliefs put more effort and work for longer periods of time to accomplish a given task (Schunk, 1989). Consequently, it can be said that self-efficacy beliefs are of critical importance in instrumental education, which requires intensive practice, like all educational fields. Therefore, it is recommended that future further studies should be conducted to determine those factors influencing fine arts high school students' self-efficacy beliefs regarding instrument education. If such prospective studies are successful in identifying these factors, measures can then be taken to eliminate these factors. Thus, the quality of instrument education in fine arts high schools can be developed.

The results of the present study also reported a negative significant relationship among the participants' musical instrument education motivation, musical instrument performance self-efficacy-beliefs, attitudes, and burnout. Existing literature on the concept of burnout has primarily focused on the burnout in the corporate and business world (Yang & Farn, 2005) and its negative consequences on corporate life. However, some studies investigating students' burnout regarding their educational institutions have been undertaken, and this signifies a new approach in the literature. These studies have reported that burnout may cause students to become desensitized, to burn out emotionally, and to feel unsuccessful in their endeavors. This situation may lead to a fall in students' motivation towards lessons and, consequently, an increase in their absenteeism (McCarthy, Pretty& Catano, 1990; Yang & Farn, 2005). The results of the present study indicating a negative relationship among motivation, self-efficacy, attitude, and burnout are corroborated by existing literature in the field.

The findings obtained in this study suggest that fine arts high school students' motivation is a significant predictor of their burnout. This result indicates that the students' motivation regarding musical instrument education decreases their burnout level. In other words, the students' burnout level decreases as their motivational level increases. To my knowledge, there is not any study on a relationship between motivation and burnout in the field of music in the literature. However, considering relevant theoretical and empirical studies conducted in different but related fields, the results of the relevant literature are consistent with the results of the present study. Several studies in the relevant literature have found a significant relationship between motivation and burnout. Lamyree, Treasure and Roberts (2006) conducted a study on a group of athletes, and found the motivation to be a significant predictor of burnout; in a similar study, also on a group of athletes, Appleton and Hill (2012) also reported

a significant relationship between motivation and burnout. Aypay and Eryilmaz (2012) conducted a study on high school students and found that students' motivation to attend courses decreases as their burnout level increases. The relationship between motivation and burnout is supported by Pines's Psychoanalytic-Existentialist Model; according to Pines and Aranson (1988), burnout can be defined as a loss of enthusiasm, energy, idealism, perspective, and purpose, and can be described through physical, emotional, and mental symptoms leading to the feelings of continuous stress, hopelessness, despair, and a sense of being trapped. It can be argued that decreasing fine arts high school students' burnout levels regarding instrument education contributes to an increase in their motivation. Therefore, it is necessary to determine the causes leading to fine arts high school students experiencing burnout regarding instrument education. Based on the results of this study, the researchers suggest that further studies should be conducted to investigate the source of burnout among fine arts high school students—and whether these sources are family-based or teacher-based etc.—so that informed measures can be taken to eliminate negative causes. Consequently, it is hoped that students' burnout levels can be decreased, and their motivation can, therefore, be indirectly increased.

This study also found that fine arts high school students' musical instrument performance self-efficacy beliefs were a significant predictor of their burnout levels. According to this result, participants' burnout levels decrease as their level of instrument performance self-efficacy beliefs increases; that is, their level of instrument performance self-efficacy decreases as their level of burnout increases. Although no similar studies in the field of music education could be found, several studies from different but related fields revealed findings that corroborate the result of the present study (Yang& Farn, 2005; Schwarzer & Hallum, 2008; Skaalvik &Skaalvik, 2009; Ciftci, 2015; Karahan & Balat, 2011; Saricam & Sakiz, 2014). This situation can be explained by the personal success dimension, the third dimension of Maslach's burnout model. According to Maslach, a low-level personal success is one constituent part of burnout in the individual in question (Demir, 2010). This model defines burnout as a syndrome manifesting itself as a feeling of exhaustion and a decrease in personal success and competence (Aksoy, 2007). According to the results of the present study, determining those factors that negatively influence fine arts high school students' competence and success regarding instrument education, and the elimination of those factors can help to decrease student burnout in instrument education. Thus, further studies can be conducted to determine those factors influencing fine arts high school students' competence and success regarding instrument education.

The attitudes of fine arts high school students regarding instrument education were found to be a significant predictor of burnout. The results of the present study have shown that the participants' attitudes regarding instrument education increase their burnout level decreases. In other words, the participants' attitudes decrease as their burnout level increases. To my knowledge, there is not any study indicating a relationship between attitude and burnout has in the literature. Further studies on the relationship between burnout and attitudes can, therefore, provide considerable contributions to the current literature due to this gap in this research. The findings

obtained in this study suggest that determining those factors that negatively influence fine arts high school students' attitudes toward instrument education and eliminating these factors can help to decrease students' burnout in instrument education. Hence, it is hoped that further studies will be conducted to determine the influencing factors on fine arts high school students' attitudes toward instrument education.

Hitherto, Turkish literature on the burnout within music education has mostly focused on music teachers and preservice music teachers (Otacioglu, 2008; Kucuksuleymanoglu & Onuray Egilmez, 2013; Talsik, 2016; Inci & Burak, 2017). The researcher suggests that further studies should be conducted to investigate the burnout among students from different institutions.

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Güzel Sanatlar Liselerinde Çalgı Eğitiminde Tükenmişliğin Yordayıcısı Olarak Motivasyon, Özyeterlik ve Tutum

Atıf:

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Özet

Problem Durumu: Ülkemizde müzik eğitimi veren kurumlardan birisi de müzik öğretmenliği bölümleridir. Müzik öğretmenlerinin, müzik eğitiminin olumlu etkilerinden öğrencilerinin faydalanmasını sağlamada bir köprü oluşturacak olması nedeniyle oldukça önemli bir yere sahip olduğu söylenebilir. Diğer alan öğretmenlerin de olduğu gibi müzik öğretmenleri de meslek yaşamlarında farklı ekonomik ve sosyal yapılardan gelen öğrencilerle karşılaşmaktadırlar. Aynı sınıftaki öğrencilerden bazıları, müzik eğitimine özendirici ortamlarla okul dışında karşılaşabilirken, bazıları sadece müzik dersleri yoluyla müzik eğitimine özendirici ortamlarla karşılaşabilmektedir. Bu noktada müzik öğretmenleri, müzik eğitimine özendirici ortamlarla sadece okul ortamında karşılaşan öğrencileri müzik eğitimine çekmede önemli bir anahtar görevi görmektedir. Çalgı müzik öğretmeninin temel materyallerinden birisidir. Bu bağlamda çalgısında iyi yetişmiş müzik öğretmenleri, öğrencilerde itici bir güç oluşturarak, öğrencilerini müzikle ilgilenmeye teşvik edebileceği söylenebilir. Bu durum öğrencilerin müzik eğitiminden en üst düzeyde faydalanmasını sağlayabilir. Bu görüşler ışığında müzik öğretmenliği bölümlerinde çalgı eğitiminin oldukça önemli bir yere sahip olduğu söylenebilir. Ancak müzik öğretmenliği bölümlerine, geçmişlerinde bir çalgı eğitimi deneyimi olan ve olumsuz deneyimlerinden dolayı olumsuz duyuşsal özelliklere sahip olarak gelen öğrencilerin çalgı eğitiminde istenen başarıyı ve gelişmeyi gösteremedikleri görülmektedir. Öğrencilerin sahip olduğu duygusal dirençleri kırmak öğretmen için oldukça büyük sorun teşkil etmektedir. Bu nedenlerle müzik öğretmenliği bölümlerine gelen ve bir müzik geçmişi olan öğrencilerin, müzik öğretmenliği bölümlerine gelmeden önce eğitim aldıkları kurumlarda yaşadıkları negatif duyuşsal özelliklerin altında yatan nedenlerin belirlenmesi, söz edilen sorunların daha temel aşamadayken çözülmesine yönelik gerekli uygulamaların geliştirilmesine ve program değişikliklerine ışık tutabilir.

Müzik öğretmenliği bölümlerine gelen öğrenci profilleri incelendiğinde, bu bölümlerdeki öğrencilerin büyük çoğunluğunu güzel sanatlar liselerinden mezun olmuş öğrencilerin oluşturduğu görülmektedir. Söz edilen nedenlerle güzel sanatlar liselerindeki öğrencilerin çalgı eğitiminde karşılaştıkları duyuşsal sorunların belirlenmesi ve bu sorunların çözülmesine yönelik program ve uygulamalar geliştirilmesi, bu kurumların bir sonraki ayağı olan müzik öğretmenliği bölümlerine

öğrencilerin çalgı eğitimi ile ilgili yaşadıkları sorunların taşınmasını engelleyebilir ve söz edilen durum güzel sanatlar liselerinde ve müzik öğretmenliği bölümlerinde çalgı eğitiminde başarının ve niteliğin artmasına katkı sağlayabilir.

Araştırmanın Amacı: Bu çalışmada, güzel sanatlar lisesindeki öğrencilerin çalgı eğitiminde, motivasyonlarının, çalgı performansı özyeterlik inançlarının ve tutumlarının, tükenmişliklerini ne derece yordadığı; güzel sanatlar lisesindeki öğrencilerin çalgı eğitiminde motivasyonlarının, çalgı performansı özyeterlik inançlarının, tutumlarının ve tükenmişliklerinin düzeyleri; güzel sanatlar lisesindeki öğrencilerin çalgı eğitiminde motivasyonları, çalgı performansı özyeterlik inançları, tutumları ve tükenmişlikleri arasındaki ilişkiler belirlenmeye çalışılmıştır. Bu görüşler ışığında çalışmada aşağıdaki sorulara yanıt aranmıştır:

1. Güzel sanatlar lisesindeki öğrencilerin çalgı eğitiminde motivasyonları, çalgı performansı özyeterlik inançları, tutumları ve tükenmişlikleri ne düzeydedir?

2. Güzel sanatlar lisesindeki öğrencilerin çalgı eğitiminde motivasyonları, çalgı performansı özyeterlik inançları, tutumları ve tükenmişlikleri arasında nasıl bir ilişki vardır?

3. Güzel sanatlar lisesindeki öğrencilerin çalgı eğitiminde, motivasyonları, çalgı performansı özyeterlik inançları ve tutumları, tükenmişliklerini ne derece yordamaktadır?

Araştırmanın Yöntemi: Güzel sanatlar liselerindeki öğrencilerin çalgı eğitiminde motivasyonlarının, çalgı performansı özyeterlik inançlarının, tutumlarının ve tükenmişliklerinin arasındaki yordayıcı ilişkiyi betimlemeyi amaçlayan bu araştırma yordayıcı ilişkisel tarama modelindedir. Araştırma 2015-2016 eğitim-öğretim yılında 1., 2., 3. ve 4. sınıflarda eğitim gören 401 güzel sanatlar lisesi öğrencisiyle gerçekleştirilmiştir. Araştırmada ölçme aracı olarak, Bireysel Çalgı Dersi Motivasyon Ölçeği (Girgin, 2015), Çalgı Performansı Özyeterlik İnancı Ölçeği (Girgin, 2015), Bireysel Çalgı Dersi Tükenmişlik Ölçeği (Girgin, 2015), Bireysel Çalgı Dersi Tutum Ölçeği (Topoğlu & Erden 2012) kullanılmıştır. Öğrencilerin tükenmişlikleri, motivasyonları, çalgı performansı özyeterlik inançları ve tutumları arasındaki ilişkilerin incelenmesinde korelasyon analizi; motivasyonlarının, çalgı performansı özyeterlik inançlarının ve tutumlarının, tükenmişliklerini ne derece yordadığının belirlenmesinde regresyon analizinden yararlanılmıştır.

Araştırmanın Bulguları: **A**raştırmaya katılan güzel sanatlar lisesi öğrencilerinin "tükenmişlik" düzeyleri düşük (1,752±0,914), "motivasyon" düzeyleri yüksek (4,284±0,609); "çalgı performansı özyeterlik inancı" düzeyleri orta (3,221±0,766); "tutum" düzeyleri yüksektir (4,018±0,724). Bireysel Çalgı Dersi Tükenmişlik Ölçeği ile Bireysel Çalgı Dersi Motivasyon Ölçeği arasında en yüksek korelasyon motivasyonsuzluk ve genel tükenmişlik arasındadır ($r=-.734$; $p<0.05$). Bireysel Çalgı Dersi Tükenmişlik Ölçeği ile Çalgı Performansı Özyeterlik İnancının geneli ve alt boyutları arasında en yüksek korelasyon genel tükenmişlik ve genel çalgı performansı özyeterlik inancı geneli arasındadır ($r=-.531$; $p<0.05$). Bireysel Çalgı Dersi Tükenmişlik Ölçeği ile Bireysel Çalgı Dersi Tutum Ölçeği arasında oldukça yüksek bir ilişki vardır

(r=-.802; p<0.05). Bireysel Çalgı Dersi Motivasyon Ölçeği, Çalgı Performansı Özyeterlik İnancı Ölçeği, Bireysel Çalgı Dersi Tutum Ölçeği ile Bireysel Çalgı Dersi Tükenmişlik Ölçeği arasındaki neden sonuç ilişkisini belirlemek üzere yapılan regresyon analizi istatistiksel olarak anlamlı bulunmuştur (F=254,486; p=<0.05). Regresyon analizi sonuçlarına göre güzel sanatlar lisesi öğrencilerinin çalgı eğitiminde, motivasyonları, çalgı performansı özyeterlik inançları ve tutumları, tükenmişliklerinin anlamlı birer yordayıcılarıdır (R^2=0,650).

Araştırmanın Sonuçları ve Öneriler: Araştırma sonunda, güzel sanatlar lisesindeki öğrencilerin çalgı eğitiminde tükenmişlik düzeylerinin düşük, motivasyon düzeylerinin yüksek, çalgı performansı özyeterlik inancı düzeylerinin orta, tutum düzeylerinin yüksek olduğu; güzel sanatlar lisesindeki öğrencilerin çalgı eğitiminde motivasyonları, çalgı performansı özyeterlik inançları, tutumları ve tükenmişlikleri arasında negatif yönde anlamlı bir ilişki olduğu; güzel sanatlar lisesindeki öğrencilerin çalgı eğitiminde motivasyonlarının, çalgı performansı özyeterlik inançlarının ve tutumlarının, tükenmişliklerinin anlamlı birer yordayıcısı olduğu sonucuna ulaşılmıştır. Bu çalışmada motivasyon, çalgı performansı özyeterlik inancı ve tutum yordayıcı değişken olarak ele alınmıştır. Diğer araştırmacılarca güzel sanatlar liselerindeki öğrencilerin çalgı eğitiminde farklı duyuşsal değişkenlerin tükenmişliği yordama gücü belirlenebilir. Ayrıca ulusal yazında müzik eğitiminde tükenmişlikle ilgili çalışmaların daha çok müzik öğretmenleri ve müzik öğretmeni adaylarına yönelik olduğu görülmüştür. Araştırmacılara müzik eğitiminde farklı kurumlardaki öğrencilerin tükenmişlikleri ile ilgili çalışmalar yapmaları önerilebilir.

Anahtar Sözcükler: Müzik eğitimi, mesleki müzik eğitimi, çalgı eğitimi, duyuşsal faktörler

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Development of the Attitude towards Science Scale: A Validity and Reliability Study

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ABSTRACT

Purpose: This study aimed to develop an attitude scale to find out middle school students' (grades 5 through 8) attitudes towards science and to investigate the effects of grade level on students' attitudes towards science.

Research Method: Cross-sectional survey method was used in this study. The attitude towards the science scale developed by the researchers was applied to a sample of 691 middle school students. Fifth, sixth, seventh, and eighth-grade students' level of attitudes towards science were determined and compared through this scale.

Findings: The data, which were collected in this study, were analyzed using SPSS 22.0 package program and analyzed by Exploratory Factor Analysis (EFA) to establish the construct validity of the scale. The data were analyzed by confirmatory factor analysis to show the validity of the four-factor structure that was generated by EFA, and it was seen that this four-factor structure was at an acceptable level.

Implications for Research and Practice: The findings of this study showed that there was not any significant difference between 5th, 6th, 7th and 8th-grade students' attitudes towards science scores. Cross-sectional studies with various scales may be conducted for different grade levels and different disciplines in future studies. Attitude studies of cross-age characteristics and various scale studies may be carried out to find out the relationship between different age groups and attitude scores towards science

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Introduction

Attitude can be defined as the tendency of giving a positive or negative response to an object, person, institution, or incident. Although the figural definitions of attitude vary, most of the contemporary social psychologists accept that the evaluative aspect of attitude is its typical characteristic (Ajzen, 2005). According to another definition, attitude is the readiness of an individual for giving cognitive, emotional, and behavioral reactions towards his own self, an object, or an incident that developed around him based on his knowledge and experience gained throughout his lifetime (Inceoglu, 1993, p. 15). Attitudes are composed of three elements as follows: cognitive, emotional, and behavioral (McGuire, 1985). Cognitive elements of attitude comprise the knowledge, belief, and thoughts of the person, which he/she owns towards the attitude object, based on his/her personal experiences. The effective element of attitude is the positive or negative feelings of an individual about the attitude object (Koklu, 1995, p. 81). The behavioral element of attitude shows the tendency of an individual to display an act about an attitude fact (Tavsancil, 2014, p. 77).

Thurstone, Likert, Guttman, and emotive meaning scales are the most popular scales among the attitude scales (Fishbein & Ajzen, 1974), which indicated that four scales have different aspects (Anderson, 1988, as cited in Cikrikci, 1991), whereas Thurstone, Likert, and Guttman scales are composed of sentences, emotive meaning scales consist of adjective lists (Wright & Feinsten, 1992). Although all aspects making up attitude and representing the aspects are included in Thurstone and Guttman scales, Likert-type scales focus on two end-points of attitude; positive and negative (Tavsancil, 2014, p. 79). The respective scoring is carried out based on each answer (such as agree, disagree) on Likert-type scales. Likert type scales are the most frequently used attitude scales. Likert type scales have strengths in comparison to other scales, including easy preparation and applicability, allowing a single-dimension structure, allowing scoring and scoring reliability, and testing the inter-item relations statistically (Babbie, 2014; Bayat, 2014; Seker & Gencdogan, 2014).

Developing a positive attitude has a crucial importance in science education. The cognitive learning objectives in the Turkish science curriculum were prepared in integration with affective and psychomotor skills by the Ministry. In these curricula, the learning domain of effect expects students to develop positive attitudes towards science and enjoy science (Turkish Ministry of National Education, 2005; 2013; 2018). Attitude towards science is an individual's organization of beliefs and cognitive schemas, leading to the affective reactions of that individual toward science (Reid, 2006). The emergence of these reactions shows the tendency of individuals to reach some decisions, including inclining to careers and courses related to science and willingness to participate in investigating scientific developments and scientific activities (Jones, Howe & Rua, 2000; Osborne, Simon & Collins, 2003).

Identifying the attitudes of people toward science provides prior knowledge of their future behaviors. Thus, there are studies that reported the attitudes toward science started by the end of the 20th century (Fraser, 1978; Ormerod & Duckworth, 1975; Reid, 2006; Rennie & Punch, 1991). The main cause of conducting these studies

was the concern that interest in science declined and a negative attitude towards science was adopted in developed countries, including the UK and the USA. These studies enable the determination of the reasons for developing a negative attitude towards science in society and making the necessary regulations (Osborne, Simon & Collins, 2010). Attitude scales have been developed to identify attitudes toward science in many studies (Afacan, Aydogdu & Usak, 2006; Akpinar, Yildiz, Tatar & Ergin, 2011; Balim, Sucuoglu & Aydin, 2009; Kececi & Zengin, 2015; Kenar & Balci, 2012; Nuhoglu, 2008; Shrigley, 1974; Sener & Tas, 2016; Tekkaya, Cakiroglu & Ozkan, 2002; Thompson & Shrigley, 1986; Yasar & Anagun, 2009).

It can be seen that the attitude-scale studies towards science are shaped around the changing science topic names and contents, which are carried out with primary or middle school students (Balım, Sucuoglu & Aydin, 2009; Kenar & Balci, 2012; Nuhoglu, 2008; Yasar & Anagun, 2009). Along with these scales, there are also some studies in the literature, which have been carried out to measure the attitudes of preservice teachers towards science courses and experiences (see Afacan, Aydogdu & Usak, 2006; Tekkaya, Cakiroglu & Ozkan, 2002; Shrigley, 1974; Thompson & Shrigley, 1986). In a study conducted by Sener and Tas (2016), a scale was developed to investigate students' attitudes towards science. However, the number of attitude-scale studies is not at a satisfactory level for measuring middle school students' attitudes towards science in general, which is more complicated compared to the lesson contents of science. Therefore, there is a need for more comprehensive scales to be used for identifying middle school students' attitudes toward science. The present study aims is to develop a questionnaire that can measure attitudes towards science with all dimensions. The main purpose of the science teaching program is scientific literacy for each student. In this respect, seven learning domains are determined. Attitudes domain is one of seven main domains and it has an important role for scientific literacy (Kavak, Tufan & Demirelli, 2006). Scientific and technological developments of countries form a labour force in areas related to science. To form such a labour force, youngsters need to develop positive attitudes towards these areas. Second, it was aimed to investigate the 5th, 6th, 7th, and 8th graders' attitudes towards science and to investigate its relation with the grade level (cross-sectional). Thereby, how middle-grade students' attitudes towards science can change over time can be determined. In consideration of this process, we try to seek the answers for the following research questions:

1. Does the attitude-scale towards science have validity and reliability?

2. What kinds of relations are there among students' grade levels and their attitudes towards science?

Method

Research Design

The cross-sectional survey design was used in this study. This research design allows the characterization of an incident, object, group, or subject as in real life, which

permits the representation of variables related to the research area in detail (Johnson, 2001; Karasar, 2005, p. 77; Mertens, 2014, p. 173).

This study is a cross-sectional study permitting the immediate identification of the states and behaviors of individuals about a subject or question (Gay, Mills & Airasian, 2009; Ucar, 2011; Woodcock & Reupert, 2012). Cross-sectional studies help to gather data about a specific from a sample representative of the population (Fraenkel, Wallen & Hyun, 2012, p. 394). The most fundamental benefit of cross-sectional studies may be regarded as determining whether there is a change in an individual with the improvement of cognitive development level and experiences about a specific subject or question. It is thought that in addition to the determination and comparison of 5th, 6th, 7th and 8th graders' attitudes towards science by including its cross-sectional.

Research Sample

The target population of this study consisted of students attending three different secondary schools located in a city center in the Central Anatolian Region during the spring semester of the academic year of 2017–2018. The cluster sampling method, which is a probability-based sampling method, was selected to set the study sample. In the cluster sampling method, the target population is divided into various groups and each group is accepted as a cluster. Random selections are made among the clusters and a sample is formed (Comlekci, 2001, p. 90; Mertens, 2014, p. 319). When determining the sample, the students comprising the universe of the study were considered as clusters concerning grade levels. The sample comprises randomly selected classes from the four clusters that were formed based on grade levels (see Table 1). Out of 691 students making up the sample, 375 were male and 316 were female.

Table 1.

Sample Distribution by Grade Level and Gender

Grade Level	Girl	Boy
5	61	46
6	76	76
7	85	81
8	153	113
Total	316	375

Research Instruments and Procedures

The following steps were suggested by DeVellis (2003, pp. 60–96) in the development of the attitude scale towards science.

Determining the Theoretical Framework of Measured Characteristics

The objective within the first phase of the scale development process was to identify the characteristics, comprising the theoretical infrastructure of attitudes towards science, by analyzing the national and international literature. Within this context, an in-depth literature review was carried out. The studies which were about attitudes towards science and scale development studies were selected. After examining these studies, items that were representing attitudes towards science were specified and listed. In the list, items that indicated the same characteristics were grouped. Items in each group were evaluated together to create a new attitude towards science items. In addition to these characteristics, those within the items of scale studies about science and attitude-related gains in the curriculum of Turkish Ministry of National Education were taken into consideration, as well (Balim, Sucuoglu & Aydin, 2009; Ebenezer & Zoller, 1993; Fraser, 1978; Germann, 1988; Kennedy, Quinn & Taylor, 2016; Kind, Jones & Barmby, 2007; Mejias-Algarin, 1989; Misiti, Shrigley & Hanson, 1991; Nuhoglu, 2008; Pell & Jarvis, 2001; Schreiner & Sjoberg, 2004; Wang & Berlin, 2010; Yasar & Anagun, 2009).

Creating Item Pool

The data collected in the first stage were analyzed, and the characteristics which were thought to represent the attitude towards science were identified. Item expressions ensuring the testing of each character were written, and an extensive item pool was generated. The features considered for writing the attitude expressions, which were included in the scale, were as follows: The items must be the expressions of what is needed or unneeded and the factual statements were avoided (Tezbasaran, 2008, p. 12), each item must consist of only a single expression for the character which is to be measured (Edwards, 1983), the scale items must be expressed as short and simple, not causing misunderstandings (Tezbasaran, 2008, p. 12), the items do not contain words that are not used in daily life frequently and do not contain foreign words (Edwards, 1983), a number of choices and choice expressions are not to include expressions that are hard to be distinguished by the responders, the number of choices to be included in Turkish scales had to be maximum five (Seker & Gencdogan, 2014, p. 8), words implying the degree (quantity) of the character that is to be measured by the scale are not to be used in the item (Seker & Gencdogan, 2014, p. 8), the number of positive items are to be equalized to the number of negative items in the scales as much as possible. Hence, the students would be prevented to give stereotypical reactions without reading the items (Tezbasaran, 2008, p. 12).

Determining the Scale Type

In the third stage of the scale development studies, the scale type to be used, and the answer choices were determined. It was decided that the Likert type scale was to be used in this scale development study owing to its implementation and preparation convenience. Likert scale was organized as a five-point Likert type, thought to be the best for the perceiving and distinguishing level of the group, with whom the scale will be applied. The developed scale did not consist of the choices, including "I have no idea," "I am undecided," "I don't know," which are used in the implementation of

Likert type attitude scales. These choice categories show that the responders have knowledge or experience deficiencies about the subject and therefore, they don't allow the responders to give positive and negative reactions (Basar, 2010; Ocal, 2012; Sturgis, Roberts & Smith, 2014). In the developed scale, all choice categories were organized to provide scores between 1 and 5 among the choices "I don't agree absolutely" and "I completely agree" to eliminate the confusion of the responders because of the intermediate choice categories.

Consulting Expert Opinion

Expert opinion was resorted to after deciding the scale type in the fourth stage. The items included in the scale were reviewed by two academicians who were experts in science education, one person who was an expert in Turkish language and literature, and two science teachers, and their opinions were received. The necessary revisions were made on the items based on the feedback from the experts. Based on expert reviews, some words were changed to improve clarity and some items that were not considered appropriate as attitude expressions were removed from the scale. Revised attitude items were evaluated as positive, negative, and neutral by 60 students, representing the target population, to whom the scale was to be applied. Four items which were not evaluated as positive or negative and were difficult to be understood by the student group were removed from the scale as a result of the pilot implementation (Anderson, 1988, as cited in Cikrikci, 1991). It was decided that a total of 40 items remained in the scale, 20 of them were positive and 20 of them were negative, as a result of the removal of the items.

Applying the Scale

Adding one check item, the pilot form of the scale consisted of a total of 40 items. It was aimed to distinguish the responders who answered the items of the scale randomly using the check item (Adams, Perkins, Podolefsky, Dubson, Finkelstein & Wieman, 2006). The check item was included in the scale: This item was included to check whether the study participants answered this scale after they had read it. The following instruction was provided: "If you are reading this item, please mark the choice of 4". The scale was prepared for the pilot implementation stage by making the necessary writing, orthographic and formal arrangements on the scale items.

The pilot study was conducted using a 90-person sample, including 20 fifth graders, 20 sixth graders, 30 seventh graders, and 20 eighth graders. The student sheets in which the relevant answer was not given fort the check item were not evaluated in the pilot study. The data collected as a result of the pilot study were analyzed using the SPSS 22.0 package program and analyzed. The item analysis aimed to determine and identify the items that did not successfully reflect the character, which was desired to be assessed and measured in terms of reliability and validity among the scale items. It was decided that four items were to be removed from the scale to improve the reliability and validity of the scale as a result of the item analysis.

Final Shape of the Scale

The scale consisted of 36 items finally as a result of the data collected during the pilot study. Again, a check item was added to the scale, to find out whether the scale was answered randomly. The necessary writing, orthographic, and formal arrangements were made and the final form of the scale was generated. In 50 sheets, the answer '4' was not given. Thus, these sheets were removed from the final data set. Finally, data that came from 691 student sheets were sent to SPSS 22.0 program.

Data Analysis

To support the construct validity of the scale, first, the scale was applied to a sample of 363 students, and Explanatory Factor Analysis was conducted. To verify the construct, Confirmatory Factory Analysis was carried out with a sample of 328 students.

The data collected by the attitude towards the science scale (ATSS) were analyzed by exploratory factor analysis (EFA) to determine the factor structure and establish construct validity. The data were analyzed by confirmatory factor analysis (CFA) using the LISREL 8.80 package program to provide evidence for the accuracy of the factor structure found out as a result of EFA. Moreover, Cronbach Alpha's internal consistency was estimated to provide evidence for the reliability of the entire scale and its subfactors. The data were analyzed using one-way analysis of variance to determine whether the scores received in the attitude towards the science scale varied based on grade level.

Results

Exploratory Factor Analysis

Descriptive statistics about the items making up ATSS are shown in Table 2.

Table 2.

Descriptive Statistics about the ATSS

Item	$\bar{x}$	SS	SS^2
1	3.7088	1.21643	1.480
2	4.1401	1.22851	1.509
3	4.2885	1.11922	1.253
4	3.3984	1.38194	1.910
5	3.6593	1.37045	1.878
6	3.4148	1.28817	1.659
7	3.4313	1.40570	1.976
8	4.1731	1.42595	2.033
9	3.7225	1.52208	2.317
10	3.4011	1.39404	1.943
11	3.4835	1.53822	2.366

Table 2 Continue

Item	$\bar{x}$	SS	SS²
12	2.7225	1.52931	2.339
13	3.6374	1.39077	1.934
14	3.3654	1.48677	2.210
15	3.6758	1.40419	1.972
16	3.2253	1.50621	2.269
17	3.9533	1.43568	2.061
18	3.5934	1.51013	2.281
19	3.5742	1.42295	2.025
21	3.7692	1.41286	1.996
22	3.1868	1.38994	1.932
23	4.2967	1.31944	1.741
24	3.7967	1.41320	1.997
25	4.0604	1.36330	1.859
26	4.1291	1.37564	1.892
27	3.7335	1.36782	1.871
28	3.9066	1.41112	1.991
29	3.6511	1.47401	2.173
30	4.1758	1.38344	1.914
32	3.7665	1.43659	2.064
33	3.8736	1.47727	2.182
34	3.4148	1.47370	2.172
35	4.3022	1.26050	1.589
36	1.9615	1.30211	1.695
37	4.0137	1.31209	1.722
38	4.1346	1.41655	2.007
39	3.2637	1.33266	1.776
40	4.0412	1.35693	1.841
41	3.7527	1.38841	1.928

It can be seen that the mean total scores received in ATSS is 147.8324, its standard deviation is 30,50407, the variance is 930,498, the minimum is 53, the maximum is 196, kurtosis value is -.153, and skewness value is -.677. The kurtosis and skewness values ranged between -1 and +1 and this shows that the distribution is normal (Tabachnick & Fidell, 2001).

Kaiser-Meyer-Olkin (KMO) coefficient and Barlett test conducted to determine the suitability of the data collected in the attitude of towards science scale for factor

analysis. The KMO coefficient of .876 of the scale items and Barlett test result showed significance at the level of .000 (x^2 = 2248.748, sd = 630, p<. 001). A KMO coefficient larger than 0.60 and a Barlett test result of smaller than 0.05 are the indicators showing that the scale is suitable for factor analysis. The collected results revealed that the scale items are suitable for factor analysis.

Principal component analysis and Varimax rotation technique, a vertical rotation technique, were used to identify the factor structure and factor loads. As a result of the Varimax rotation technique, attention was paid so that the relation level of each item with a factor was 0.30 and higher (Ozcan, 2019; Secer, 2015; Tabachnick & Fidell, 2001). Attention was paid so that there was a difference at the level of 0.10 between the levels of the relation of the items gathered under multiple factors with the factors. An item, which showed a relation with different factors and had a relation level of less than 0.10 (cyclic), was removed from the scale (Secer, 2015). Factor analysis was repeated after the item was removed. As shown in Table 3 that the scale items are distributed in four factors with the repeated factor analysis. Naming these four factors, the common characteristics of the items, which comprise the factors, were considered, along with the contents of the factors used in similar studies within the literature. The enjoyment factor has 13 items (1, 2, 5, 8, 15, 17, 20, 24, 27, 29, 30, 33, 34), the confidence factor has 12 items (4, 9, 10, 12, 14,16, 21, 23, 26, 32, 35, 37), the usefulness factor has seven items (3, 6, 7, 11, 13, 18, 25) and the interest factor has four items (22, 28, 36).

Table 3.

EFA Results about the ATSS

Factors	Item	1	2	3	4	r
Factor 1 Enjoyment	15	.776				.624
	27	.776				.420
	20	.726				.471
	29	.715				.568
	5	.685				.704
	24	.678				.612
	1	.676				.493
	8	.611				.493
	17	.609				.474
	30	.594				.434
	34	.590				.590
	33	.528				.598
	2	.502				.658

Table 3 Continue

Factors	Item	1	2	3	4	r
	32		.686			.658
	21		.686			.766
	26		.681			.647
	16		.660			.528
	4		.656			.750
Factor 2	35		.642			.762
Confidence	37		.622			.663
	10		.577			.356
	14		.561			.475
	12		.552			.698
	23		.549			.427
	9		.527			.646
	18			.760		.728
	13			.714		.411
	11			.651		.726
Factor 3	25			.576		.648
Usefulness	7			.546		.675
	6			.543		.652
	3			.532		.634
	36				.582	.576
Factor 4	28				.559	.641
Interest	31				.541	.666
	22				.534	.568
Eigenvalue		15.719	2.210	1.987	1.525	
Variance %		21.555	16.795	12.817	8.391	
Cumulative Variance %		21.555	38.351	51.168	59.559	
Cronbach Alpha (α)		0.91	0.74	0.76	0.72	
Total α= .93						

The eigenvalue of each factor must be minimum 1 for each factor to be acceptable (Buyukozturk, 2013). The eigenvalue of the four factors obtained as a result of EFA were 15.719, 2.210, 1.987, 1.525 and 1.388, a, respectively. The variance values

explained by each factor were 21.555%, 16.795%, 12.817% and 8.391%. The cumulative variance value explained by the entirety of the factors was estimated at 59.559%. Considering the item-total test correlations, it was seen that these values were at the range of .411 and .766 ($p<.01$). These values to be higher than .30 indicated that the scale items provided an adequate level of distinguishing (Field, 2009).

Considering the descriptive statistics included, it can be seen that the kurtosis and skewness values of the scores of the scale's sub-dimensions ranged between -1 and +1. This indicates that the total scores received in the entire scale were in conformity with the kurtosis and skewness values and that these scores had a normal distribution (Tabachnick & Fidell, 2001).

The correlation values were estimated to establish the relations of the factors included in the scale with each other and it was found out that the correlation values between the factors ranged between .511 and .753 (Table 4). Considering the correlation values, it can be indicated that the sub-dimensions making up the scale had a positive and strong relationship with each other (Buyukozturk, 2013; Ozcan, 2019). At the same time, multicollinearity among factors was tested by conducting multiple regression correlation. The results showed that, as shown in Table 5, tolerance values were found to be between.077 and .749 and inflation values were found to be between -0.03 and 1.476. The tolerance values below 1 and and the inflation values below 10 shows that there is not multicollinearity among factors (Field, 2009).

Table 4.

Correlation Values between Sub-Dimensions of the Scale

	Enjoyment	Confidence	Usefulness	Interest
Enjoyment	1			
Confidence	.642*	1		
Usefulness	.753*	.568*	1	
Interest	.632*	.511*	.569*	1

*p<.01

Table 5.
Multiple Regression Analysis Results of the Sub-Dimensions

Sub-Dimensions	B	β	t	p	Collinearity Statistics	
					Tolerance	VIF
(Constant)	1,476	,141		10,49	,000	1,476
Enjoyment	-,006	,003	-,147	-1,612	,108	-,006
Confidence	,007	,004	,125	1,776	,077	,007
Usefulness	,006	,006	,076	,928	,354	,006
Interest	-,003	,009	-,022	-,320	,749	-,003

Confirmatory Factor Analysis

CFA ensures the assessment of the conformity of the factor structure formed as a result of EFA with the data (Floyd & Widaman, 1995; Tabachnick & Fidell, 2001). CFA was performed using LISREL 8.80 package program to verify and validate the four-factor structure obtained as a result of EFA. Considering the CFA results that are shown in Table 6, when the chi-square accommodation conformity was divided to the degree of freedom, the value of 2 was found out and this indicated that the scale was in perfect conformity (Kline, 2005). Similarly, agree with an RMSEA value of 0.051, an NFI value of 0.93, and the NNFI, CFI, and IFI values of 0.98 showed that the scale was in perfect conformity (Byrne, 1998; Hu & Bentler, 1999). SRMR value of 0.05 expressed that the scale had perfect conformity (Brown, 2006). Considering all the fitting indexes together with AGFI (0.87) and GFI (0.85) values, there is evidence for the construct validity of the scale (Joreskog & Sorbom, 1993).

Table 6.
CFA Goodness of Fit Values for ATSS

Index	Obtained Values	Accepted Values
X^2 / sd	2	≤ 3 = perfect fit (Kline, 2005)
RMSEA	0.055	≤0.06 = perfect fit (Hu & Bentler,1999)
SRMR	0.05	≤0.05 = perfect fit (Hu & Bentler,1999)
NNFI	0.97	≥0.95 = perfect fit (Hu & Bentler,1999)
NFI	0.93	≥0.90 = good fit (Hu & Bentler,1999)
CFI	0.97	≥0.95 = perfect fit (Hu & Bentler,1999)
IFI	0.97	≥0.95 = perfect fit (Byrne,1998)
GFI	0.85	≥0.85 = (Joreskog & Sorbom, 1993)
AGFI	0.87	≥0.85 = (Joreskog & Sorbom, 1993)

As can be seen in Figure 1, error variances of the variables are between .42 - .88 following CFA, which means that the error variances are not on a high level. Additionally, the standardized path coefficients (Figure 1) of the factors are as follows: For enjoyment factor: .45 and .73; for confidence factor: .39 and .65; for usefulness state factor: .54 and .71; for the factor for interest: .45 and .76.

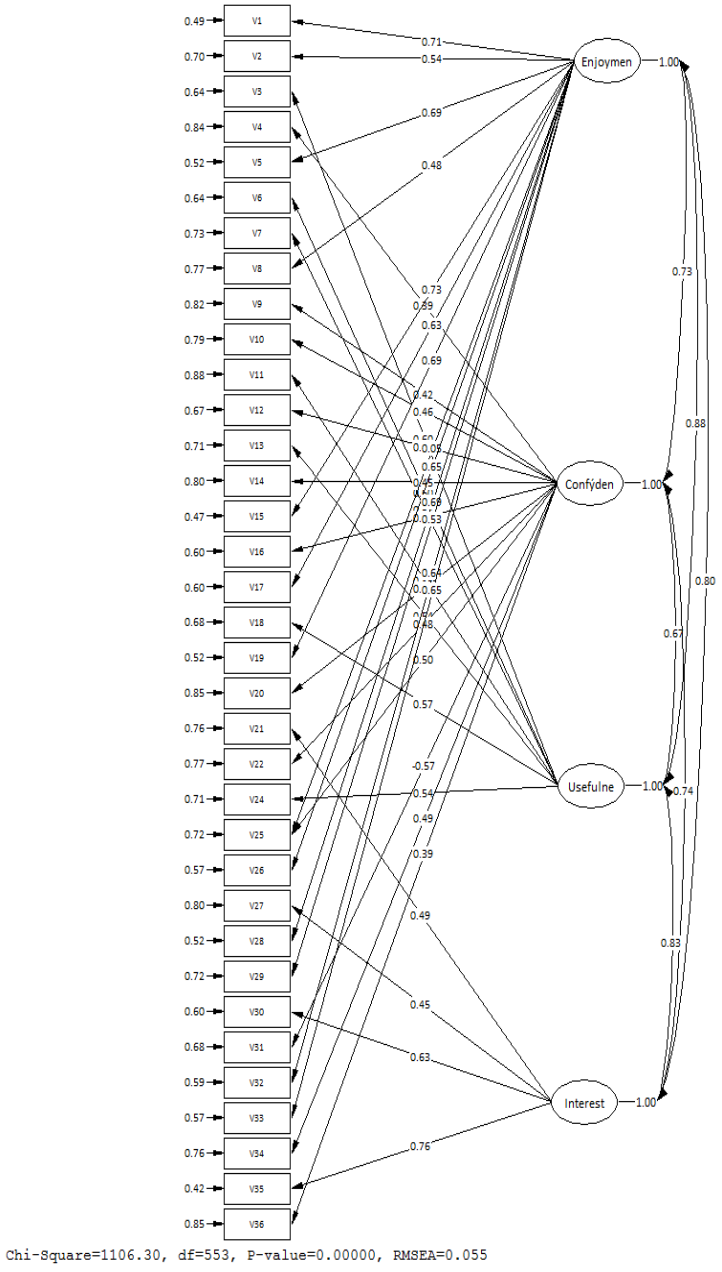

Figure 1. Path Diagram for ATSS

Reliability Analysis

Cronbach Alpha coefficient was estimated to provide evidence about the reliability of the 36 items included in ATSS. Table 7 shows that the Cronbach Alpha coefficients of .70 and higher that were found for all factors established evidence for the reliability of the scale (Buyukozturk, 2013).

Table 7.

Reliability Coefficient for ATSS and its Factors

Factors	Number of items	α
Enjoyment	13	.91
Confidence	12	.74
Usefulness	7	.76
İnterest	4	.72
Total	36	.93

Data on the Difference between the Scores of Attitudes towards Science based on Grade Levels

Table 8 shows that the 5th graders had the highest science attitude score average ($\bar{x} = 154.4074$), and the 7th graders had the lowest science attitude score average ($\bar{x} = 142.9610$).

Table 8.

Descriptive Statistics on Students' Attitude Scores toward Science by Grade Level

	Grade level	n	$\bar{x}$	SS
Attitude scores for Science	5	54	154,4074	29,45128
	6	87	152,0805	30,84101
	7	77	142,9610	29,00519
	8	145	145,4384	31,01634
	Total	363	147,8324	30,50407

Table 9 shows that there was no significant difference between the score averages of the attitudes of the students at different grades towards science a result of the performed variance analysis (F= 2,380; p> .001).

Table 9.

One-way ANOVA Test Results about the Difference between Students' Attitude Scores towards Science based on their Grade Levels

	Source of the Variance	KT	GL	KO	F	p	Significant Difference
Attitude towards Science	Between the Groups	6568.475	3	2189,492	2,380	.069	5th grade> 6, 7, 8th grade 6th grade> 5, 7, 8th grade 7th grade> 5, 6, 8th grade
	Inner Group	331202.30	360	920,006			
	Total	337770,77	363				

Discussion, Conclusion, and Recommendations

In the current study, a scale for determining students' attitudes towards science, (science is a broader area than science lessons) was developed. The attitude towards the science scale developed as a result of this study consisted of 36 items (excluding the check item) and was organized as a five-point Likert scale (see Appendix). To establish construct validity of the scale, factor analysis was conducted. EFA showed that scale was constructed of four factors, the relevance values between items and factors were between .502 and .776, item-test correlation values were between .411 and .766, and the factors explained 59.559% of the total variance. To provide evidence to four-factor construct that was obtained from EFA, CFA was carried out on a different sample. CFA also confirmed that four-factor construct (enjoyment, confidence, usefulness, interest). It was seen that Cronbach Alpha coefficients found from each factor making up the scale and from the entire scale were higher than 0.70. This provided evidence for the reliability of the scale. This scale development study, with established validity and reliability, consists of attitude components completely reflecting the science field.

Studies conducted on attitude towards science have received great attention from the past to the present. Attitude studies have been conducted at various grade levels, on various main themes and in various cultures in the national and international literature (Fraser, 1982; Schreiner & Sjoberg, 2004). The number of studies conducted

on science education has increased in Turkey in recent years because of the failures of students seen in the science field in various tests, including OSYM (Student Selection and Placement Centre), PISA (Programme for International Student Assessment), TIMSS (Trends in International Mathematics and Science Study), and the regression in the levels of interest on this field (Aydeniz, 2017). Establishing students' attitudes towards science and identifying the source of their negative attitudes before the educational process is a crucial issue for providing quality science education (Gomleksiz & Yuksel, 2003).

When relevant research studies were reviewed, it was found that there were both similarities and differences between the findings of the current study and that of prior research studies. Investigating students' attitudes towards the science field, Kenndy, Quinn, and Taylor (2016) purported that the attitudes towards science had six sub-dimensions, enjoyableness, self-efficacy, difficulty, usefulness for career, relevance for everyday life, and intention to enroll. Yasar and Anagun (2009) established that attitudes had three sub-dimensions, dependent on proofs, curiosity and persistence, and Wang and Berlin (2010) identified that attitudes towards science class had a single dimension. Sener and Tas (2016) found out that attitude towards sciences had five sub-dimensions as daily life and learning new knowledge, difficulty in application, problem-solving, motivation, and anxiety. As a result of this study, on the other hand, it was deduced that attitudes towards science had four sub-dimensions, namely enjoyment, confidence usefulness and interest. The enjoyableness and usefulness for the career sub-dimension of Kenndy, Quinn, and Taylor (2016) are similar to the enjoyment and usefulness sub-dimension of the current study and both sub-dimensions point to students' perceived competence in the areas of science. There are some studies that found different sub-dimensions when compared to the current study (Yasar and Anagun, 2009; Kenndy, Quinn, and Taylor, 2016; Sener and Tas, 2016). It is thought that these factors making up the basis students' attitudes towards science are the students' belief in the facilitation of their daily life using their science knowledge, their levels of self-confidence to succeed in the science field, and the levels of their knowledge in these fields.

Considering the mean total scores received from the attitude towards science scale, it was seen that the 5th, 6th and 7th graders received higher scores in comparison to the 8th graders. However, it was seen that the difference between the mean scores was not significant. The findings showed that positive attitudes developed towards science diminished in time in contrast to what was anticipated with the improvement of cognitive development depending on the rise of grade level.

Pell and Jarvis (2010) ascertained that students' scientific attitudes regressed during the process from the age of five years till the age of 11 years as their age increased and this regression was more conspicuous in female students in comparison to the male students. In a similar study, they saw that the attitudes of the students at the range of 11 years old and 14 years old towards science showed regression as students' education levels increased. It was also put forward that this regression was more distinct in female students (Kind, Jones, & Barmby, 2007). The regression occurred in students' attitudes depending on the increase of their grade levels as a

result of these studies was in conformity with the data collected as a result of the research. In a study investigating attitudes towards science class in Taiwan, it was concluded that there was no significant difference in science attitude based on grade level and gender in similar to the result of this study (Wang & Berlin, 2010).

In a cross-sectional study conducted on the change of attitudes of students enrolled in the 3rd grade up to the 12th grade towards science, results were similar. In contrast to this study, former study showed a regression in the levels of student attitudes as their grade level increased (Said, Summers, Abd-El-Khalick & Wang, 2016). It was determined that the regression in these attitude changes occurred because the students thought that their skills in science education fields worsened and due to the loss of their faith in the benefits and necessity of science education.

The efficiency in teaching and learning science can be improved using an attitude towards the science scale. Thus, teachers may use the attitude scale developed in this study to establish students' attitudes towards science both before and after education. Moreover, this scale may also be used to determine the degree of their attitude gains in the affective dimension of science curriculum the following education. Thus, organization and development of activities included in the curriculum concerned with attitude gain may be managed. Cross-sectional studies with various scales may be conducted for different grade levels with different disciplines in future studies. Moreover, various scale studies may be carried out to find out the relationships between different age groups and attitude scores towards science.

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Fene Yönelik Tutum Ölçeğinin Geliştirilmesi: Geçerlik ve Güvenirlik Çalışması

Atıf:

Ozcan, H., & Koca , E. (2020). Development of the attitude towards science scale: A validity and reliability study. *Eurasian Journal of Educational Research*, *85*, 109-134, DOI: 10.14689/ejer.2020.85.6

Özet

Problem Durumu: Tutumlar, bir kişiye, bir nesneye, bir olaya karşı olumlu veya olumsuz tepkide bulunma eğilimi olarak tanımlanabilir. Tutum konusunda 20 yy. ortalarından günümüze kadar farklı tanımlamalar yapılmıştır. Tutumların tanımlanması kadar ölçülmesi konusunda da çok sayıda bilimsel çalışmalar yürütülmüştür. Tutumların ölçülmesi konusunda davranışlardan çıkarımda bulunma, fizyolojik tepkilerden çıkarımda bulunma veya ölçek kullanma gibi yöntemler kullanılmıştır. Bu yöntemler içerisinde tutum ölçekleri, kullanım kolaylığı, zaman tasarrufu ve soyut kavramları ölçmedeki başarısı ile tutumların ölçülmesinde en çok tercih edilen yöntemler olmuştur. Tutum ölçekleri hazırlanış ve kullanış şekillerine göre Likert, Thurstone, Guttman, Duygusal anlam ölçeği gibi farklı türlere ayrılmaktadır.

Fen alanına yönelik tutumlar 20. yüzyıldan itibaren çoğu bilimsel çalışmanın konusu olmuştur. İngiltere ve ABD gibi gelişmiş ülkelerde fen derslerine yönelik ilginin azaldığının tespit edilmesinin üzerine fen alanına yönelik tutumların ölçülmesi konusunda önemli adımların atılmaya başlamıştır. Fene yönelik tutumların ölçülmesi çalışmaları birçok ülkede ulusal ve uluslararası boyutlarda sürdürülmüştür. Günümüzde de fen okuryazarı bireyler yetiştirilme hedefi, MEB Fen Bilimleri Öğretim Programı duyuş boyutunda tutumlara yer verilmesi, STEM yaklaşımının

benimsenmeye başlaması nedeniyle fene yönelik ilginin arttırılmasının amaçlanması ve gelecekte ülkelerin ihtiyaç duyacağı mesleklerin fen ile ilişkili olması gibi pek çok fakör fene yönelik tutumların ölçülmesini gerekli kılmaktadır.

Araştırmanın Amacı: Bu çalışmada fene yönelik tutum ölçeği (FYTÖ) geliştirilmesi, 5, 6, 7 ve 8. sınıf düzeyinde öğrenim görmekte olan öğrencilerin fene yönelik tutumlarının ölçülmesi amaçlanmıştır. Ayrıca çalışma farklı düzeyde yapılarak ise sınıf düzeyi ile fene yönelik tutum arasındaki ilişkinin araştırılması amaçlanmaktadır. Çalışmanın sonuçları, fene yönelik tutumların belirlenmesi ve tutumların istenilen düzeylere ulaşabilmesi için araştırmacılara, program hazırlayıcılara ve öğretmenlere yol gösterici olacağı düşünülmektedir.

Araştırmanın Yöntemi: Bu ölçek geliştirme çalışmasında nicel araştırma yönteminin temel alındığı tarama modeli kullanılmıştır. Çalışmanın evrenini 2017-2018 eğitim-öğretim yılı bahar döneminde bir il merkezinde bulunan üç farklı ortaokulda öğrenim gören öğrenciler oluşturmaktadır. Bu çalışmanın örneklemi 316'sı kız 375'i erkek olmak üzere toplam n= 691 öğrenciden oluşmaktadır.

Ölçek geliştirme sürecinin ilk aşamasında ilgili ulusal ve uluslararası alan yazın incelenerek fene yönelik tutumların teorik altyapısı oluşturulmuştur. Aynı zamanda fen alanında daha önce yapılmış ölçek geliştirme çalışmaları ile MEB tarafından Öğretim Programı'nda tutumla ilişkili olarak yer verilen kazanımlar gözden geçirilmiştir. Uygulanma ve hazırlanma kolaylığı nedeniyle bu ölçek geliştirme çalışmasında Likert tipi ölçek kullanılmasına karar verilmiştir. Likert ölçeği, ölçeğin uygulanacağı grubun algılama ve ayırt edebilme düzeyine en uygun olacağı düşünülen beş puanlı likert biçiminde düzenlenmiştir. Ölçekte yer alan maddeler, Fen Bilgisi Eğitimi alanında uzman iki kişi, Türk Dili ve Edebiyatı alanında uzman bir kişi ve iki Fen Bilimleri öğretmeni tarafından incelerek görüşleri alınmıştır. Uzmanlardan alınan dönütler doğrultusunda, doğrudan tutumları ifade etmediği belirtilen 8 madde ölçekten çıkarılmış ve diğer maddeler üzerinde önerilen düzenlemeler yapılmıştır. Revize edilen tutum maddeleri, ölçeğin uygulanacağı evreni temsil eden 60 kişilik bir öğrenci grubu tarafından olumlu-olumsuz-nötr şeklinde değerlendirilmiştir. Öğrenci grubu ile yapılan ön deneme sonucu maddelerde herhangi bir anlaşılmayan ifade olmadığı görülmüştür. Bu çalışma sonucu ölçekte 20'si olumlu, 20'si olumsuz toplam 40 maddenin kullanılmasına karar verilmiştir.

Ölçekte yer alan 40 maddeye bir adet kontrol maddesi ilave edilerek pilot ölçekte toplamda 41 madde olması sağlanmıştır. Kontrol maddesi kullanılarak ölçekte yer alan maddelere rastgele cevap verenlerin ayırt edilmesi amaçlanmıştır. Kontrol maddesi "Bu madde ölçeği okuyarak cevaplayıp cevaplamadığınızı kontrol etmek için yazılmıştır. Eğer bu maddeyi okuyorsanız "4 no.lu kutucuğu işaretleyiniz." şeklinde ölçeğin 20. madde olarak yer almıştır. Ölçek maddeleri üzerinde gerekli olan yazım, imla ve biçimsel düzenlemeler yapılarak ölçek pilot uygulama aşamasına hazır hale getirilmiştir.

Ölçeğin pilot uygulaması 20'u 5. sınıf, 20'u 6. sınıf, 30'u 7. sınıf ve 20'si 8. sınıf olmak üzere toplam 95 kişilik bir örneklem ile gerçekleştirilmiştir. Pilot uygulama neticesinde kontrol maddesine beklenen seçeneğin işaretlenmediği ölçekler

değerlendirmeye alınmamıştır. Pilot uygulama sonucunda elde edilen veriler SPSS 22.0 paket programına aktarılarak analiz edilmiştir. Ön deneme ve pilot uygulama aşamalarından elde edilen veriler sonucu nihai ölçekte 36 maddeye yer verilmiştir. Ölçeğe 20. madde olarak ölçeğin rastgele cevaplandırılıp cevaplandırılmadığını belirlemek adına kontrol maddesi ilave edilmiştir. Gerekli yazım, imla ve biçimsel düzenlemeler yapılarak ölçeğin nihai formu oluşturulmuştur. Oluşturulan nihai formun uygulanması neticesinde elde edilen veri setinde öncelikle kontrol maddesine "katılıyorum" cevabının verilmediği 50 ölçek örneklemden çıkarılmıştır. Elde edilen 691 ölçeğin verileri (363'ü AFA ve 328'i DFA çalışmalarında kullanılmak üzere ayrı ayrı aktarılmıştır) SPSS 22.0 ve LISREL 8.80 paket programlarına aktarılmıştır.

Veriler, öncelikle faktör yapısının saptanması amacıyla Açımlayıcı Faktör Analizi'ne (AFA) tabi tutulmuştur. Ardından elde edilen yapının kabul edilebilir olup olmadığına ilişkin kanıt oluşturmak için Doğrulayıcı Faktör Analizi'ne (DFA) tabi tutulmuştur. Fene yönelik tutum ölçeğinden elde edilen puanların sınıf düzyine göre farklılaşıp farklılaşmadığını tespit etmek amacıyla ise veriler tek yönlü varyans analizine (Anova) tabi tutulmuştur.

Araştırmanın Bulguları: Açımlayıcı Faktör Analizi sonucunda bir maddenin ölçekten çıkarılmasına karar verilmiştir. Temel bileşenler analizi ve Varimax döndürme tekniği sonucunda Fene yönelik tutum ölçeğinin dört faktörlü bir yapıya sahip olduğu görülmüştür. AFA sonucu elde edilen dört faktörlü yapının değerlendirilip doğrulanması amacıyla LISREL 8.80 paket programı kullanılarak DFA yapılmıştır. DFA sonucu ki-kare iyilik uyumunun serbestlik derecesine bölümü 2, RMSEA değeri 0.051, SRMR değeri 0.05, NFI değeri 0.93 ve NNFI, CFI ve IFI değerleri 0.97 olarak bulunmuş olup ölçeğin mükemmel uyuma sahip olduğunu göstermektedir. DFA sonucunda maddelerin sahip oldukları faktör ağırlıklarının .42 ile .88 arasında değişmekte olup anlamlı bulunmuştur.

FYTÖ'de yer alan 36 maddenin güvenirliğine ilişkin kanıt oluşturabilmek amacıyla Cronbach Alpaha katsayısı hesaplanmıştır. Ölçeğin tamamından elde edilen Cronbach Alpha katsayısı .93 olarak bulunmuştur. Hoşlanma faktörü için hesaplanan iç tutarlık katsayısı .91, Güven faktörü için hesaplanan iç tutarlık katsayısı .74, Fayda faktörü için hesaplanan iç tutarlık katsayısı .76 ve İlgi faktörü için hesaplanan iç tutarlık katsayısı .72 olarak bulunmuştur.

Sonuç ve Öneriler: Bu çalışma sonucunda geliştirilen Fene Yönelik Tutum Ölçeği, 36 maddeye (kontrol maddesi hariç) sahip ve 5'li likert biçiminde düzenlenmiştir. Örneklemden elde edilen veriler ölçeğin dört faktörlü bir yapıya sahip olduğunu göstermiştir. Ölçeği oluşturan faktörlerin her birinin ve ölçeğin tamamının güvenilirliği yüksektir. Veriler üzerinde sırasıyla gerçekleştirilen AFA ve DFA sonuçları oluşturulan yapının kabul edilebilir olduğu kanıtlamaktadır. Geçerliği ve güvenirliği kanıtlanmış olan bu ölçek geliştirme çalışması fen alanını kapsayan tutum öğelerinin tamamını kapsamaktadır. Fene yönelik tutum ölçeğinden alınan toplam puanların tek yönlü varyans analizi sonucu 5, 6, 7 ve 8. sınıf öğrencilerinin puanları arasında anlamlı bir farklılığın bulunmadığı görülmüştür.

Anahtar Kelimeler: Fen eğitimi, öğrenci tutumu, ölçek geliştirme

Appendix: Attitudes Towards Science Scale

Sevgili öğrenciler,
Bu ölçek fene yönelik tutumlarınızı belirlemek amacıyla hazırlanmıştır. Her bir maddeyi dikkatle okuduktan sonra, buna ne derece **katıldığınızı** veya **katılmadığınızı** ilgili kutucuğa **(X)** işareti koyarak belirtiniz.
Vereceğiniz cevaplarda **samimi olmanız** ve **boş madde** bırakmamanız oldukça önemlidir.
Teşekkürler.

Fene Yönelik Tutum Maddeleri	**Hiç Katılmıyorum →**				**Tamamen Katılıyorum**
1. Fen dersini diğer derslerden zevkli bulurum.	1	2	3	4	5
2. Fen dersinde kendimi kötü hissederim.	1	2	3	4	5
3. Fen öğrenmeyi gerekli bulurum.	1	2	3	4	5
4. Fen soruları beni korkutmaz.	1	2	3	4	5
5. Fen çalışmaktan keyif alırım.	1	2	3	4	5
6. Fen çalışırken kendimi rahat hissederim.	1	2	3	4	5
7. Fen ile ilgili araştırmalar önemsizdir.	1	2	3	4	5
8. Fen dersi sevmediğim dersler arasındadır.	1	2	3	4	5
9. Fen konularını öğrenmekte güçlük çekerim.	1	2	3	4	5
10. Fen dersi ile ilgili projeler hazırlama konusunda endişe duymam.	1	2	3	4	5
11. Fen ile ilgili bir meslek tercih edeceğim.	1	2	3	4	5
12. Fen çalışırken gergin olmam.	1	2	3	4	5
13. Fen günlük yaşamımı kolaylaştırır.	1	2	3	4	5
14. Fen dersi ile diğer dersler arasında ilişki kurmakta sorun yaşarım.	1	2	3	4	5
15. Fen dersini sabırsızlıkla beklerim.	1	2	3	4	5

16. Fen ödevlerini yaparken kendime güvenmem.	1	2	3	4	5
17. Fen dersini dinlerken sıkılırım.	1	2	3	4	5
18. Fen dersi günlük hayatta karşılaştığım problemleri çözmek için katkı sağlar.	1	2	3	4	5
19. Fen dersinde eğlendiğimi hissederim.	1	2	3	4	5
20. Fen ile ilgili soruları cevaplarken zorlanırım.	1	2	3	4	5
21. Fen derslerinde yaptığımız deneyler dikkatimi çekmez.	1	2	3	4	5
22. Fen projeleri hazırlama konusunda kendime güvenirim.	1	2	3	4	5
23. Fen çalışmak beni mutsuz eder.	1	2	3	4	5
24. Fen, dünyamızdaki sorunları çözmede faydasızdır.	1	2	3	4	5
25. Fen dersinde stresli olurum.	1	2	3	4	5
26. Fen dersinde kendimi iyi hissederim.	1	2	3	4	5
27. Fen dersi kapsamında düzenlenen gezilere ilgi duymam.	1	2	3	4	5
28. Fen dersinin olduğu günlerde okul çekilmez hâle gelir.	1	2	3	4	5
29. Fen ile ilgili araştırma yapmak tam bana göredir.	1	2	3	4	5
30. Fen öğrenmek zaman kaybıdır.	1	2	3	4	5
31. Fen dersinde kendimi tedirgin hissederim.	1	2	3	4	5
32. Fen ile ilgili yeni bilgiler öğrenmek hoşuma gider.	1	2	3	4	5
33. Fen dersinin olduğu gün okula gelmek istemem.	1	2	3	4	5
34. Fen problemlerini çözmekte iyiyimdir.	1	2	3	4	5
35. Fen konuları ilgimi çekmez.	1	2	3	4	5
36. Arkadaşlarımla fen konuları ile ilgili sohbet etmekten çekinmem.	1	2	3	4	5

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Development of Secondary School Students' Relational Thinking Skills with a Teaching Experiment*

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ABSTRACT

Purpose: Since there are a limited number of studies on how to develop relational thinking in secondary school students in mathematics education literature, this study will contribute to the field both in theoretical terms and concerning the implications for in-class applications. In this respect, this study aims to examine how to develop the relational thinking skills of 5th-grade students.

Research Methods: The participants of this study, which was adopted as a research design of the teaching experiment, were six students attending 5th grade in secondary school. The teaching process was eight sessions per week with one session. The main data source of this study was in-class teaching videos. The data were analyzed descriptively.

Findings: The questions, the in-class dialogues directing relational thinking and activities in each session of the teaching experiment conducted with the fifth-grade students were presented under related themes.

Implications for Research and Practice: The most general result was that at the end of the teaching process based on numbers, relationships between numbers, operations and properties, the students made use of equality axioms to evaluate the true/false and open number sentences without any calculation. It was also seen that the students made connections between addition-subtraction, addition-multiplication and multiplication-division and that they made effective use of commutative, associative and distributive properties.

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Introduction

Children are first introduced to arithmetic, and they then start learning algebra with symbols and connections. Algebra allows people to make simple algebraic descriptions or to use letters and symbols while dealing with equations that seem to be complicated for most people (Blanton, 2008). The transition from arithmetic to algebra starts at early age with activities related to numbers and is expected to be generalized towards the end of elementary school education. Generalized arithmetic refers to a generalization of properties of numbers and operations. Boulton et al. (2000) claim that to achieve the transition from arithmetic to algebra in accordance with the consecutive development model of the algebraic knowledge, students should first have the knowledge and skills found in the arithmetic step of this model. This knowledge includes knowledge of fundamental properties of operations, such as commutative property, associative property and distributive property, and the skills include the ability to work backward and to recognize that the values on both sides of an equal sign are the same. The development of basic arithmetic operation skills allows writing number sentences and understanding a number in various forms (7-2=5, 3+2=5, 5+2=7). Students can deal with number sentences given in the form of true/false or open number sentences by focusing on the relationship between equality and numbers. Both the fragmentation of numbers in different ways and the association between equality and numbers are extremely critical for the generalized arithmetic and require relational thinking, which has an important role in the development of algebraic thinking.

According to Koehler (2004), relational thinking provides a different perspective to arithmetic rather than direct calculation and plays a key role in learning arithmetic. Stephens (2006) points out that relational thinking basically depends on students' use and understanding of varieties between numbers in a number sentence. Carpenter, Franke and Levi (2003) claim that relational thinking should be taught to students for two reasons. First, relational thinking, which provides flexibility and allows acting fast in teaching arithmetic, is also a prerequisite to algebraic thinking. During the elementary grades, much instructional time in mathematics is devoted to developing fluency with multiplication (Stephens, Ellis, Blanton & Brizuela, 2017). For example, Carpenter, Levi, Berman and Pligge (2005) found that especially elementary school students use the distributive property in number sentences involving multiplication. Baek (2008) also points out that the primary school students (3.-5.) who understood; especially the associative and distributive properties of multiplication were successful in solving verbal multiplication problems involving multi-digit numbers. This research results show that students intuitively make judgments based on operations properties, such that this process prepares students for algebraic thinking. Secondly, relational thinking provides a substantial basis for the transition to algebra. Students regard four operations as a process of doing operation when they learn using traditional methods. In relational thinking, number sentences are taken into account as a whole rather than as processes that have to be followed step by step, and the purpose is to have students avoid calculations and to help them recognize that both sides of equality represent the same numbers. The focus of this purpose lies in the

concept of equality. Therefore, equality and relational thinking should not be separated from one another.

In literature, many researchers focus on the meaning of the equal sign and the concept of equality. In this respect, most of the studies have been carried out with elementary school first, second and third-grade students. For example, Koehler (2004) worked with first and second-grade primary school students, Carpenter et al. (2003) worked with primary school students at all levels, Molina and Ambrose (2006) worked with third-grade students, Molina, Castro and Mason (2008) with eight-year-old students, Molina and Mason (2009) worked with eight and nine-year-olds, Eichhorn, Perry and Brombacher (2018) worked with 2nd and 3rd-grade students with an average age of eight years and four months.

In the literature, there are also studies that focused on the use of the equal sign in mathematics textbooks and on the extent to which these textbooks supported relational thinking (Seo & Ginsburg, 2003; Köse & Tanışlı, 2011). For example, Seo and Ginsburg (2003) stated that the contents of the elementary school mathematics textbooks they studied were limited in supporting relational thinking, that equality was matched with performing an operation, and that the number sentences were predominantly given in a standard format, such as a + b = c or a-b = c.

Some of the studies in the literature examined the relationship between the relational meaning of the equal sign and secondary school students' solving equation problems (Alibali, Knuth, Hattikudur, McNeil & Stephens, 2007) or simple linear equations (Knuth et al., 2006). These researchers agreed that students did not have any disposition towards operational understanding while forming the relational meaning and that this situation was a reflection of the process of teaching the concepts (Stephens, Ellis, Blanton & Brizuela, 2017, p. 391). Thanks to this agreement, the researchers started to focus on how teaching processes should be while forming the relational meaning of the equal sign and to develop relational thinking. In studies carried out with students at early ages, the findings showed that early algebra teaching involving the generalized arithmetic approach allowed students to recognize basic operations and properties of operations, such as commutative, to produce different ways of thinking in their reasoning about numbers, operations and properties of operations and even to make various generalizations (Carpenter et al., 2003; Bastable & Schifter, 2008; Blanton et al., 2015; Steinweg, Akinwunmi & Lenz, 2018). When the related literature is examined, it could be stated that the studies examining the teaching processes and focusing on the relational meaning of the equal sign and the development of relational thinking were mostly carried out with preschool and primary school students (Carpenter et al., 2003; Blanton et al., 2015; Steinweg et al., 2018; Strachota, Knuth & Blanton, 2018) and that relevant studies conducted with secondary school students were limited (Napaphun, 2012). The main reason for this is that equality is a key concept in mathematics since preschool. On the other hand, the secondary school fifth grade, which involves a transition from arithmetic and algebra could be regarded as a key grade for the development of students' thinking (Kızıltoprak & Yavuzsoy Köse, 2017). In this respect, it is important to reveal students' ways of thinking and reasoning with the help of a teaching process, which will develop

relational thinking. In the first phase of this study, in which clinical interviews were used to examine relational thinking skills of fifth-grade students before and after the teaching process (Kızıltoprak &Yavuzsoy Köse, 2017), it was seen that the students answered the open and true/false number sentences based on the result-oriented operational process during the pre-interviews; that they answered these open and true/false number sentences based on the relationships between numbers and operations during the post-interviews; and that they all developed their relational thinking skills. This result could be said to reflect the teaching process. The present study, which is the second phase, aimed to examine the teaching process conducted and to present in detail with the help of sample activities and in-class discussions on how the properties of operations were used for the development of the students' relational thinking and which concrete materials were used.

Research Purpose

In this study, the purpose was to examine how to develop relational thinking skills of fifth-grade students. In line with this purpose, the following research question was directed:

- How are the number sentences and properties of operations used in the teaching process to develop students' relational thinking skills?

This study, which focused on the development of relational thinking, is thought to act as a guide for mathematics teachers for teaching the relational meaning of the concept of equality as well as for providing a holistic view regarding operations and operational properties. The designed teaching process will not only allow presenting the given concepts, their order of presentation and the related materials but also help explain how and which number sentences will be used for the development of students' thoughts. Given that the concept of equality and arithmetic operations are taught starting from the primary school first grade, the present study could be said to be beneficial for those interested in curriculum development, for those authoring mathematics textbooks and mathematics teachers.

Equality and Relational Thinking

Equality is one of the first mathematical concepts that students start learning at the primary school level. In addition, studies carried out after 1980s at different levels ranging from preschool to high school revealed that students fail to understand the concept of equality and the equal sign (e.g. Falkner, Levi, & Carpenter, 1999; McNeil & Alibali, 2005; Matthews, Rittle-Johnson, McEldoon & Taylor, 2012; Sáenz-Ludlow & Walgamuth, 1998). Understanding mathematical equality requires that the values on both sides of the equal sign must be the same and that this is not an easy process (Kızıltoprak & Yavuzsoy Köse, 2017). Unfortunately, most primary, elementary and middle school students do not focus on the relational meaning of the equal sign, which is an indicator of the concept of equality. However, they tend to regard its operational meaning as a command to be used for the application of arithmetic operations (Rittle-Johnson, Matthews, Taylor &McEldoon, 2011). For instance, Falkner and colleagues (1999) reported that most primary school students (first and second grades) regarded

the equal sign in an open number sentence like 8+4=…+5 as the application of the operation and that they put 12 or 17 in the blank given in the number sentence. In the study, only a few students reported that the equal sign represented a relationship and that the values on both sides of the equality should be the same. This study by Falkner et al. (1999) could be said to constitute a ground for many studies regarding the equal sign. The results of many other studies demonstrated that students tended to focus on the operational meaning of the equal sign and to regard the sign as the answer, as the total or as adding the numbers given before the sign (Byrd, McNeil, Chesney & Matthews, 2015; Matthews & Rittle-Johnson, 2009; McNeil & Alibali, 2005; Sáenz-Ludlow & Walgamuth, 1998).

The structure of the number sentence also has an important role in understanding the equal sign. For example, students not only experience difficulty in dealing with equalities which do not have the standard structure of a+b=c given as operations-equals-answer but also think that the number sentences in the structure of only operations-equals-answer are true while evaluating whether a number sentence is true or false (Falkner et al., 1999; Rittle-Johnson & Alibali, 1999). Seo and Ginsburg (2003) reported that the students did not accept the equalities which included operations on the right side (c=a+b) or on both sides (a+b=c+d) or no operations (c=c). Given that students mostly face the operational meaning of the equal sign both in their textbooks (Seo & Ginsburg, 2003; Köse & Tanışlı, 2011) and in in-class activities (Carpenter et al., 2003) makes it more difficult to understand the concept of equality. However, a developmental process involving continuity requires understanding the concept of equality (Rittle-Johnson et al., 2011), and it is important that students meet different equality structures not only in in-class activities but also in resources they use (e.g., textbooks, workbooks).

In Table 1, it is seen that the equality structures regarding the concept of equality whose development has been presented from Grade 1 to Grade 4 differ and that the students' understanding of these structures changes. This situation shows students' transition (in relation to their knowledge of equality) from the equality structures in the form of operations-equals-answer to equalities involving operations on the right side or no operations and eventually to equalities involving operations on both sides. In addition, studies revealed a relationship between knowledge of the relational meaning of the equal sign and achievement in equalities involving operations on both sides (Alibali et al., 2007; Rittle-Johnson & Alibali, 1999).

Table 1.

Development of Knowledge of Mathematical Equality

Level	*Description*	*Core equation structure*
Level 4: Comparative relational	Successfully solve and evaluate equations by comparing the expressions on the two sides of the equal sign, including using compensatory strategies and recognizing that performing the same operations on both sides maintains equivalence. Recognize the relational definition of the equal sign as the best definition.	Operations on both sides with multidigit numbers or multiple instances of a variable.
Level 3: Basic relational	Successfully solve, evaluate, and encode equation structure with operations on both sides of the equal sign. Recognize and generate a relational definition of the equal sign.	Operations on both sides: $a+b=c+d$ $a+b-c=d+e$
Level 2: Flexible operational	Successfully solve, evaluate, and encode atypical equation structures that remain compatible with an operational view of the equal sign.	Operations on right: $c=a+b$ or No operation: $a=a$
Level 1: Rigid operational	Only successful with equations with an operations-equals-answer structure, including solving, evaluating, and encoding equations with this structure. Define the equal sign operationally.	Operations on left: $a+b=c$ (including when blank is before the equal sign)

(Rittle-Johnson, Matthews, Taylor & McEldoon, 2011, p. 87)

Students examine and solve the equality structure by comparing the sentences on both sides of the equal sign at the comparative relational level, which is determined to be the top level. In this process, students can make deductions regarding the numbers and operations in equality without any calculation and confirmation. For example, while determining the number to put in the box in the open number sentence of 28+ 42= 27+ □, students may avoid subtracting 27 from the sum of 28 and 42 and can compare the equality and recognize that 27 equals to 28 minus 1. Eventually, they can find 43 as the number to be put in the box. This process is the ability defined exactly as "relational thinking". Therefore, students with the awareness of the relational meaning of the equal sign are likely to evaluate and transform the given number sentences by focusing on the structure of the equality, to relate numbers and operations and to apply different strategies while choosing appropriate numbers and this process is defined as the relational thinking skill. For instance, a student can solve the number sentence of 35+ 48+ 65 = □ by doing calculation from the left to the right. However, the student can also find the result in an easier way by equalizing the sum of the numbers to 100 (35+65). To be able to think in this way, students should see the number sentence as a whole before doing a direct calculation and should be aware of such properties of operations as associative and commutative properties (Jacobs et al., 2007). In relational thinking, the purpose is to have students begin examining the relationships without calculating the answer. In this way, students can transform number sentences by using the relationships between numbers and the fundamentals

properties of operations. This situation is beyond doing easy operations, and it allows students to acquire a different thinking skill and most importantly constitutes the basis of learning algebra.

In the present study, number sentences on both sides at third and fourth levels (given in Table 1) were adopted so that the students could evaluate and solve the given number sentences, and the focus was on the students' comparing the structures on both sides of equality and on their effective use of equality axioms to reach the fourth level.

Method

Research Design

In the present study the teaching experiment design was used. The teaching experiment design can be defined as a teaching-based research design in which researchers can reveal their students' knowledge of mathematics and examine the changes in their knowledge in learning environments designed (Steffe &Thompson, 2000).

Participants

The participants in the study were six secondary school fifth-grade students from an average state school. While determining the participants, the criterion sampling method, one of the purposeful sampling methods, was used. The first criterion considered in criterion sampling was to select fifth-grade students. The second criterion was that the selected fifth-grade students were expected to have high levels of oral expression skills. The third criterion was to select fifth-grade students with different levels of achievement. In addition, volunteerism was also considered, and the necessary consents of the related individuals and institutions were taken. Lastly, while presenting the findings, the students' names were kept confidential, and nicknames were used for anonymity.

Procedures

The teaching process was conducted by one of the authors of this paper who was an experienced teacher of mathematics with an M.A. degree in the field of mathematics teaching. The teacher frequently played the role of directing the in-class discussions during the sessions. The discussions were conducted with an inquiry-based approach. The inquiry-based environment defines as student-centered, rich in communication and cooperation, and based on research and asking questions (Chapman, 2011).

The basic purpose of a teaching experiment is to discover students' thinking processes in the learning process, and with the help of appropriate learning environments prepared in line with this discovery, the teacher can experience how mathematical knowledge regarding the target subject or concept is structured (Steffe & Ulrich, 2014). The in-class observations before the teaching process revealed that the students had difficulty telling different meanings of the equal sign and that they used

equality to find the result of an operation. It was also seen that the students demonstrated calculation-based thinking without establishing a relationship between the numbers and operations in the number sentences involving arithmetic operations and that they failed to recognize certain properties, such as commutative, associative and distributive properties and had problems, especially with the division. In this respect, a teaching process that aimed to develop the students' relational thinking skills was planned. The teaching process was conducted in eight sessions in eight weeks (once a week). Considering the ages of the students, the sessions were planned in a way to last 30-40 minutes, and breaks were given when necessary. Figure 1 presents the subjects the teacher focused on each week in the research process.

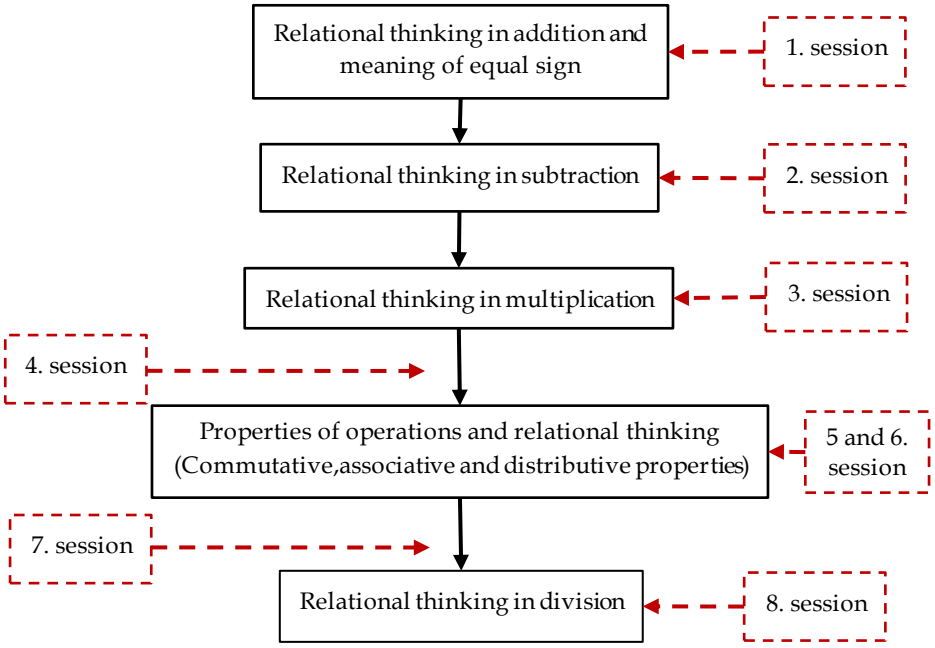


Figure 1. *Teaching Process*.

During the sessions, both individual and group works of the students were supported. In the groups formed, it was paid attention that the students were at different levels. For addition and subtraction, various equality structures which the students were familiar and unfamiliar with like a∓b=c,c=a∓b,a∓b=c∓d,a∓b=c∓d∓e,a∓b∓c=d∓e∓f were given in true/false and open number sentences. In the true/false and open number sentences involving multiplication, number sentences involving both addition-subtraction and multiplication like axb=(axc)∓d,(axb)+c=dxb were given. In the number sentences in the sessions, first, two-digit numbers were used, and in other examples, the number of the digits was gradually increased. During the teaching process, it was important for students to express their thinking easily, the reasons for their thinking were questioned

and a discussion environment was created in the classroom. In this process, the teacher provided proper directions.

Data Analysis

While collecting the research data regarding a teaching experiment, the main data collection tool included video records and observations regarding the teaching sessions.

Table 2.

Themes and Components Explaining the Development of the Students' Relational Thinking Skills

Themes		Scope of the Theme
Relational thinking in addition and meaning of the equal sign		• Modeling of equality-addition with concrete material and its expression in a number sentence • Relational thinking in open number sentences involving addition • Meaning of equal sign
Relational thinking in subtraction		• Modeling of subtraction with concrete material and its expression in a number sentence • Discovering the relationship between the minuend, subtrahend and difference • Relational thinking in open and true/false number sentences on both sides involving subtraction
Relational thinking in multiplication		• Addition-multiplication relationship Modeling of multiplication with concrete material and its expression in a number sentence • Discovering the relationship between the factors and multiplication • Multiplication-division relationship • Relational thinking in open number sentences on both sides involving multiplication and addition
Relational thinking based on properties of operations	*Commutative and associative properties*	• The commutative property, use of commutative property in true/false number sentences • The associative property, use of associative property in true/false number sentences • Use of commutative and associative properties in open number sentences on both sides
	Distributive property	• Use of commutative and associative properties in modeling activities • Discovering the distributive property, one of the modelling activities with concrete material, and its expression in a number sentence • Use of distributive property in open and true/false number sentences on both sides
Relational thinking in division		• Expressing division using a number sentence on both sides with the help of problem and concrete material • Discovering the relationship between the dividends and divisors • Relational thinking in open and true/false number sentences on both sides involving division

The data collected were analyzed not only in the research process but also at the end of the process, and the findings obtained using the analyses act as a source both for explaining the students' thoughts and for forming the hypotheses regarding their ways of probable subsequent learning (Steffe and Thompson, 2000). As the present study examined the development of the students' relational thinking skills, retrospective analyses were conducted both in the process and at the end of the process to see the changes in the students' thoughts. The researchers evaluated the students with the help of the analyses regarding the learning process after each teaching session, and they designed learning environments that would help create the grounds for the development of the students' relational thinking. After the sessions ended, the video records of all the teaching sessions were examined again by two mathematics teachers independently, and five main themes explaining the development of the students' relational thinking were obtained. Table 2 presents these five main themes and the components for the development of relational thinking in these themes.

Validity and Reliability

In the research process, validity and reliability principles were considered, and experts were asked for their views about the validity of the contents and plans used in the teaching process. The components thought to be important for the development of relational thinking in textbooks in literature are considered to be in-class discussions and number sentences used in the process. In this respect, two experts with a PhD degree in the field of mathematics education and two experienced mathematics teachers were asked for their views about whether the concepts, models and related number sentences to be used in each session were appropriate to the research purpose. In line with their views, the teaching process was revised by doing the necessary corrections in the number sentences and in the modeling, and it was piloted with fifth-grade students who did not participate in the research application. At the end of the pilot, it was observed that the number of sentences was developed to improve relational thinking and the activities prepared were in accordance with the age level of the students.

For the analysis of the teaching process, two researchers (who are also the authors of the article) monitored the sessions independently each week and evaluated whether the teachings were appropriate or not. This evaluation not only included an examination of how the students established relationships between the operations and numbers in the open and true/false number sentences but also focused on how they used the properties of operations in the process of dealing with the equalities. To support the relationships recognized with the help of different number sentences following the third and sixth sessions, the sessions were repeated. Thus, the number of total sessions was increased to eight.

Findings

In this part, the questions, the in-class dialogues directing relational thinking and the in-class activities in each session of the teaching experiment conducted with the fifth grade students have been presented under related themes.

Relational thinking in addition and the meaning of the equal sign

Figure 2 shows the flow of the first session held with the students.

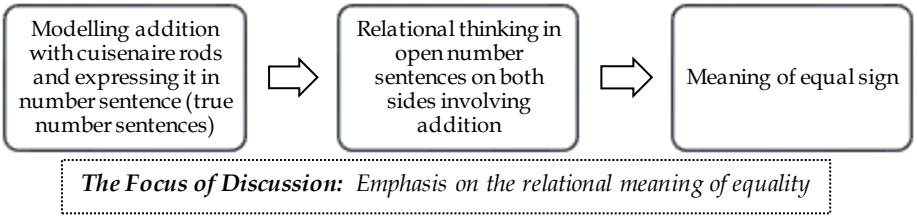
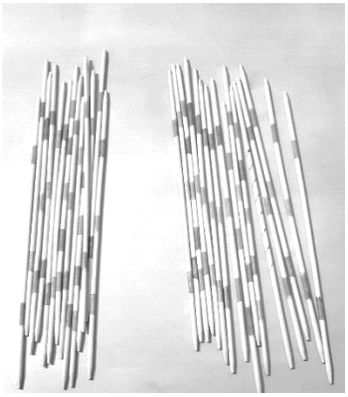


Figure 2. *Flow of the Teaching Design and Main Idea of Classroom Discussion.*

The activities designed using Cuisenaire rods were carried out with the students first within the context of addition. During the activities, each student was asked to divide 30 Cuisenaire rods into two groups by putting any number of rods they wanted in either group and to write them down. Following this, they were asked to take any number of the rods from one of the groups, to put them in the other group and to show this in table t. The students recognized the random changes of the rods as a relational change in table t (an increase and a decrease in the number of the rods). The number sentences formed were shown by the students in table t.



Addend	Addend	Sum
14	16	14+16=30
15	15	15+15=30
16	14	16+14=30
17	13	17+13=30
18	12	18+12=30
…	…	…

Figure 3. *Modelling of the Equalities with Cuisenaire Rods whose Total Numbers were 30.*

Following the activity, the open number sentences were given to the students (for example, …+7=20+8; 13+…=25+15; 26+28=…+29; 129+…=65+132; 971+108=112+…; 571+102+…= 574+105+261), and they were asked to explain their thinking processes

without any calculation. At the end of this lesson, the question of "What does equality mean to you?" was directed to the students. The students stated that the equal sign referred to a balance, and they recognized the equality axioms. Examples of the students' explanations regarding equality included "balance", "equivalence", "equality on both sides", "an equal increase, an equal decrease".

Relational Thinking in Subtraction

In the second session, as can be seen in Figure 4, first, unit cubes (30 in number) were distributed to the students so that they could do relational thinking in subtraction and establish relationships between the minuend, subtrahend, and difference, and they were asked to remove any number of cubes they wanted and to write the number of the remaining cubes.

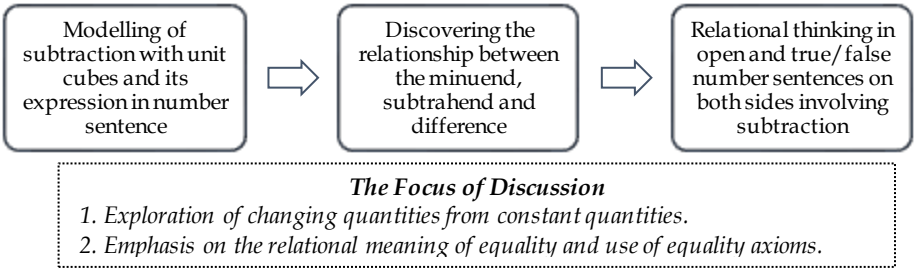


Figure 4. *The flow of the Teaching Design and Main Idea of Classroom Discussion*.

For each subtraction, discussions were held with the students who managed to determine the minuend, subtrahend and difference. Sample in-class dialogues were as follows:

Students : 30-8=22, 30-5=25, 30-6=24, 30-2=28, 30-22=8, 30-3=27.
Teacher : Which one is invariant?
Students : 30, or the minuend.
Teacher : Minuend, very good; which ones changed then?
Tülay : The subtrahend and the difference.
Teacher : Well, how did the subtrahend and the difference change? Let's see!
Ozan : We obtain different results because different numbers are subtracted.
Teacher : What else? Is there any relationship when we look at the subtrahend and the difference?
Tülay : The sum of both makes the minuend.
Teacher : The sum of both makes 30, very good, who else?
Gaye : As the subtrahend increased, the difference decreased. For example, if we subtract 3 from 30, it makes 27, and if we subtract 22 from 30, it makes 8. I mean the difference decreased more.
Teacher : How so?
Gaye : The difference decreases and increases. For example, we subtracted 3 from 30, and when we subtracted less it made 27, and when we subtracted more (30-22), it made 8.

Teacher : When we subtract a number smaller than 30, we obtain a big number, and when we subtract a big number, we get a small number. Well done! For example, here (writes 30-8=22; 30-5=25 on the board). The 30s are the same. What kind of relationship is there between the subtrahends? Let's make comparisons between the subtrahends and between the differences.

Hakkı : I subtracted 5 from 8, and it made 3. If I add 3 to 22, it makes 25.

Teacher : Very good. You mean there is a difference of 3 between 8 and 5, and again there is a difference of 3 between 25 and 22. When 3 was added to 22, it made 25.

Hakkı : I equalized them.

As can be seen in the students' in-class discussions, when the minuend remained the same in the number sentence of "30-a=b", the relationships of "a+b=30" and "30-b=a" between the subtrahend and difference were emphasized. In other words, the students concluded that b decreased when an increased and that a decreased when b increased. Therefore, the students tended to discuss the changing quantities for subtraction by giving up discussing the constant quantities.

In the second phase of this activity, the students were asked to write four number sentences, including subtraction with a constant minuend, and they were also expected to model the operation by using unit cubes. In this process, the teacher asked them whether they observed the relationship between the subtrahend and the difference and requested them to examine the number of sentences in pairs. Below are the number of sentences and expressions provided by three of the students:

Gaye	Hakkı	Ozan
30-1=29 30-4=26 (-3, +3) 30-7=23 30-8=22 (-1, +1)	30-2=28 (+2, -2) 30-4=26 (+2, -2) 30-6=24 (+2, -2) 30-8=22	22-1=21 (+1, -1) 22-2=20 (+1, -1) 22-3=19 (+1, -1) 22-4=18
"A decrease of 1 from 8 to 7; an increase of 1 from 22 to 23; a decrease of 3 from 4 to 1; an increase of 3 from 26 to 29."	"I subtracted 2 from each. As there was a decrease of 2 in the difference, an increase of 2 occurred in the subtrahend."	"There was an increase of 1 in the subtrahend and a decrease of 1 in the difference."

When the students examined the activities related to the number of sentences using the tables t, they revealed the relationship of 30-(a+x)=b-x from the relationship of 30-a=b. In this activity, which basically included equality axioms, the students stated that to maintain equality, the difference in subtraction should decrease in line with the increase in the subtrahend. To have the students better understand the relationships between the subtrahend and the difference, they were given number sentences on both sides, and they tried to interpret the equality first in true/false number sentences (e.g. "9-5=12-8", "33-27=34-26", "471-382=474-385", "674-389=664-379") and then in open number sentences without doing any calculation. Following this, they began to work on open number sentences considering the relationships they discovered in true/false sentences. For example, one of the students stated in relation to the number sentence of "33-27=34-26" that "When we subtract 33 from 34, we obtain a difference of 1, so it should not be 26 but 28", while regarding the number sentence of "471-382=474-385", another student said "True. 471 increased by 3, and it made 474. 382 increased by 3, and it made 385. I mean the difference is the same". Based on these comments of the students, it could be stated that they were able to define equality as a balance. Following the true/false number sentences, the students were given open number sentences on both sides like "92-57=…-56", "56-…=58-25", "…-37=75-38", "92-57=94-56-…", "56-23=59-25-…", "573-368=571-370+…". The students who initially established false relationships were then directed to the correct relationships as follows:

For 67-49= □-46:

Tülay : When we subtract 46 from 49, it makes 3. If we add 3 to 67, it makes 70.
Teacher : Do all of you think in the same way?
Ozan : It should be 64.
Teacher : What about you? (turning to another student)
Gaye : I found the same number, 64, too.
Teacher : You said 70 for the box, didn't you?
Hakkı : No, there was a decrease of 3 from 49 to 46, so there should be a decrease of 3 from 67, and it makes 64.
Teacher : We should focus on the difference.
İrem : Teacher, here (67-49), the subtrahend is a bigger number than the one in the other (□– 46). For the difference to remain the same, we should decrease it. Thus, it is 64.

In a given open number sentence like a-b=…-d, all the students correctly found the difference between the numbers of b and d, but some of the students initially thought that they should add this difference to a (…=a+(b-d)). It was revealed using in-class discussions that the difference between b and d should be subtracted from a based on the relational meaning of equality, and the students were told to focus on the difference.

For 92-57=94-56-□:

Hakkı : When we subtract 92 from 94, we obtain a difference of 2, and when we subtract 56 from 57, there is a difference of 1. If we add 2 to 1, it makes 3.

Teacher : Actually, I didn't understand what you mean. Well, Ozan can you explain it, please?

Ozan : Teacher, there is a difference of 2 between 92 and 94 and a difference of 1 between 57 and 56. We added the two numbers.

Teacher : Why did you add them?

Ozan : Because both sides of the equality were equal. Thus, I wrote 3.

In an open sentence like a-b=c-d-□, about which a sample in-class discussion has been presented above, all the students correctly found the difference of 2 between the minuends (a and c) and the difference of 1 between the subtrahends (b and d). Given that the students added these differences and found 3 for the number to be put in the box indicated that they made use of the relational meaning of equality.

Relational Thinking in Multiplication

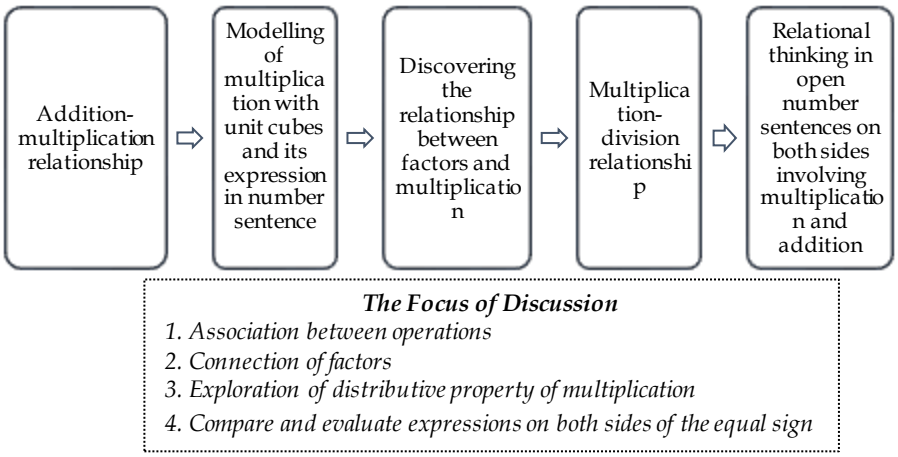


Figure 5. *The flow of the Teaching Design and Main Idea of Classroom Discussion*.

The introductory activity in the third session, which aimed to develop relational thinking in multiplication and the general flow of which is presented in Figure 5, asked the students to separate 24 unit cubes into groups with three-unit cubes in each and to discuss how to write this operation in a number sentence. In this activity, the students first wrote the number of sentences of "3+3+3+3+3+3+3+3=24" and "8x3=24". They then stated that multiplication was actually an operation of addition, and they wrote the equality of 3+3+3+3+3+3+3+3=8x3. In the activity, the students were then asked to re-group the 24 unit cubes, and they wrote a related number sentence. They modeled the operations of 24x1, 1x24, 4x3, 3x4, 6x4, 4x6, 8x3, 3x8, 12x2 and 2x12 using the unit cubes. In this way, the students identified the factors of the number 24. Following this,

the teacher wrote these operations in order and interrogated the relationships between the numbers together with the students.

24x1 Tülay : It goes on like 1,2,3,4 on the right side while the other side equals to 24.

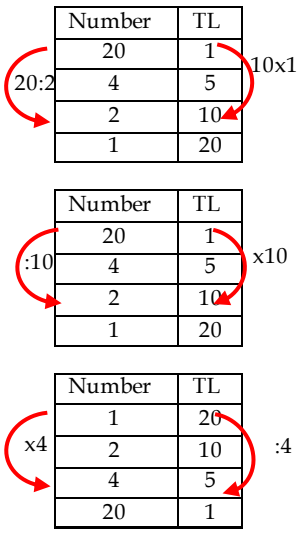
12x2 Hakkı : When 24 is divided by 12, it makes 2; when 24 is divided by 3, it makes 8; and when 24 is divided by 4, it makes 6.

8x3 Ozan : Teacher, as the factor increases, this side decreases.

6x4 Teacher: These are all the answers I have expected. All of them are correct.

When the students' views were examined, it was seen that for the operations of 24x1, 12x2, 8x3 and 6x4, Tülay focused on the invariant result of the multiplication despite the changes in the factors; that Hakkı focused on the relationship between the dividend, divisor and quotient; and that Ozan focused on the relationship between the factors. Here, the teacher asked the students to give different examples and expected them to discover the relationships between the factors. In this way, the students recognized the relationships between '1 and 2' and '120 and 60' in equality like 120x1=60x2=40x3. The teacher explained this situation stating that equality was maintained. Following this, the students wrote the equality of 1000x1=500x2=250x4 and mentioned the multiplication and division relationships between the numbers saying that 500 was half of 1000 and that 1000 was 2 times 500.

In the second lesson of the third session, imitation monetary coins and banknotes were distributed to the students. The students were given four groups of money, and each group of money made 20 TLs in sum. The students were given 20 coins of 1 TL, 4 banknotes of 5 TLs, 2 banknotes of 10 TLs and 1 banknote of 20 TLs, and they were asked to state the relationships between these coins or banknotes of 20 TLs. The students stated that all were equal to 20 TLs, and they wrote the equalities using the number sentences of 20x1=4x5=2x10=1x20. At that time, the teacher asked them to show these equalities using the table t of coin-banknote/money and to state the relationships between the factors. Accordingly, the students formed two different tables t. Thanks to this, the teacher had the opportunity not only to emphasize the commutative property but also to let the students see the multiplication-division relationship more clearly in table t.



Teacher : What is the relationship between the numbers?
İrem : The result does not change when we change their places.
Teacher : Yes, then, we can say 1x20=20x1.
We call this property the commutative property.
What other relationships are there regarding the numbers?
Gaye : Teacher, 20 is divided by 2, and it makes 10,
and when 1 is multiplied by 10, it makes 10. One side is division,
and the other is multiplication. (20:2=10x1)
Hakkı : The factor and the divisor are the same,
Teacher : How so?
Hakkı : For example, when 20 is divided by 10, it makes 2,
and when 1 is multiplied by 10, it makes 10. (20:10=2,
2 refers to 10 in table t); 1x10=10)

Teacher : Yes, for example, 4 is 4 times 1,
and what is the relationship between 20 and 5?
Students : It will be divided by 4.
Teacher : Why?
Hakkı : To equalize them.

In the activity, the commutative property was emphasized with 1x20=20x1, and the multiplication-division relationship was emphasized with 20:2=1x10, 1x4=20:5. At the end of this activity, the open number sentences on both sides involving both multiplication and addition like 3x6=(3x5)+…, (3x4)+…=10x4, 10+10+10+10-…=4x8, (5x9)+ …=10+10+10+10+10 were given, and they tried to interpret the equality without any calculation. Lastly, an open number sentence on both sides involving two unknowns were given, and a related discussion was held as follows:

For 13x10= (10x □)+Δ:

Ozan : Teacher, a lot of numbers are possible.
Teacher : Are they? Let's start with Tülay!
Tülay : We can write 13 in the box and 0 in the triangle.
Teacher : Yes.
Tülay : Also, we can write 1 in the box and 3 in the triangle.
Other students: That's not right.
Teacher : Let's have a look (writes 13x10=(10x1)+3 on the board). There should be 13 times 10, right? Is this true for here (points to the other side of the equality)?
Tülay : No.
Gaye : Teacher, I wrote 10 in the box and 30 in the triangle.
Teacher : Why did you think so?
Gaye : There is only one 10 in 13, and the remaining is 30.
Teacher : What else?

Hakkı : Teacher, we write 8 in the box and 50 in the other (triangle), and we write 7 in the box and 60 in the other, also 6 there (box) and 70 in the other just like table t...

In an open number sentence of axb=(bx□)+Δ involving two unknowns as in the activity, there are a wide variety of numbers that can be written in the box and in the triangle. It was seen that most of the students transformed 13 into the number sentences of (10x13)+0, (10x10)+30, (10x8)+50, (10x7)+60. Though the students did not explicitly state it, they actually made use of the commutative and distributive properties. They regarded 13x10 as (13+0)x10, (10+3)x10, (8+5)x10, (7+6)x10. In this example, it was also seen that the students referred to table t they had used in previous examples.

Relational Thinking based on Properties of Operations

Figure 6 presents the flow of the teaching design in this session. The students were first directed the question of "What does changing the places of the numbers mean to you" to let them interrogate whether addition and subtraction involve the commutative property.

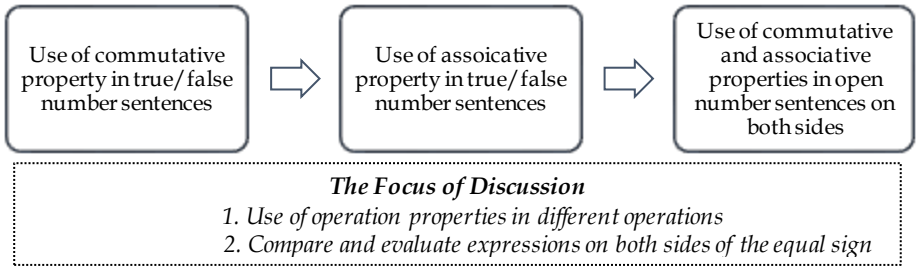


Figure 6. *Flow of the Teaching Design and Main Idea of Classroom Discussion*.

In the interrogation process, first, the number sentence of 3+8=8+3 was discussed. Following this, the students were asked whether the same relationship existed in the number sentence of 6-5=5-6. Examples of related in-class discussions were as follows:

For 6-5=5-6:

Ozan : This question is the same as the previous one (3+8=8+3). Only their places have been changed, and the numbers are the same. Also, the results of the operations are the same. Thus, it is true.

Teacher : Well, is there anyone with different views?

Semih : No, it is false.

Teacher : Why?

Semih : Teacher, in one of them, the minuend is smaller than the subtrahend, and in the other, it is bigger.

Ozan : But, the numbers are the same.

Semih : But, the result is different because it is subtraction. Thus, the equality is wrong.

Ozan : Teacher, changing the places of the numbers in addition and multiplication does not change the result, but it changes in division and subtraction.
Teacher : Good.

As can be seen in the dialogue, there were students who thought that the commutative property was true in subtraction as it is in addition. To change this view, an in-class discussion was held regarding the minuend and subtrahend, and the students stated that the properties valid in addition and multiplication may not always be true in subtraction and division. After emphasizing the commutative property, the students' attention was drawn to the associative property. The students were given true/false number sentences like 5+(3+8)=(5+3)+8, 3x(8x7)=(3x8)x7, 10-(7-2)=(10-7)-2, 20:(10:2)=(20:10):2 involving the associative property, and they were given time to examine these number sentences. The students were directed the question of "Do you need to do an operation?", and they were expected to interrogate which sentences were false and why. In this way, the students were provided with the opportunity to make generalizations regarding the properties of operations. As a result, it was emphasized that the properties valid for addition and multiplication were not true for subtraction and division. Following this, in the session, the students were given open number sentences like 9+16=□+18, 313+…=52+316, 198+980=980+…, 125+…+74=76+127+888, 113+315+801=…+316+799, 9-5=…-6, 85-…=88-36, …-21=52-23, and possible numbers to be put in the box were discussed.

For 85- □ =88-36:
İrem : 33.
Teacher : Why?
İrem : Because 88 increased 3, and I subtracted 3 from 36 to maintain the balance.
Ozan : I found 39.
Teacher : Why 39?
Hakkı : Teacher, 88 is bigger than 85 by 3. Thus, to maintain the balance with 36, we should increase 36 by 3.
Teacher : Let's think about it. That is 85, and it is 3 minus 88. Here (the number to be put in the box), if you increase it by 3, you will subtract more, won't you?

85- □=88-36

Hakkı : We have decreased the minuend.
Teacher : Then, what will the subtrahend be? It will decrease. Why?
Hakkı : Because the differences should be equal.

The first example of the in-class discussions presented above was the open number sentence given as a+□+b=(b+2)+(a+2)+888. In this example, which involved the use of the commutative and associative properties, it was seen that some of the students

found the answer to be 884 at first glance. They then thought it should be 892 because through the discussions among themselves, they had agreed that the 4 on the right side of the equation should be added to the left side. In the second example (a-□=(a+3)-36), which was similar to the first one and which should be basically solved depending on the relational meaning of the equal sign, the students initially considered subtracting the difference between the minuends from the subtrahend (36). Therefore, the students were reminded that equality should be maintained and that the difference should be bigger than 36 by 3.

Relational Thinking Based on the Properties of Operations-2

Figure 7 shows the flow of the teaching design for the sixth session, which started with a modeling activity regarding the use of the commutative and associative properties in a problem. The students were directed towards the activities that would help discover the distributive property. In this respect, the students were asked how to place biscuits in a parcel. Depending on the students' responses, related experiments were carried out using a parcel brought into the class. There were boxes in the parcel and biscuits in the boxes. The students were asked how to calculate the number of biscuits.

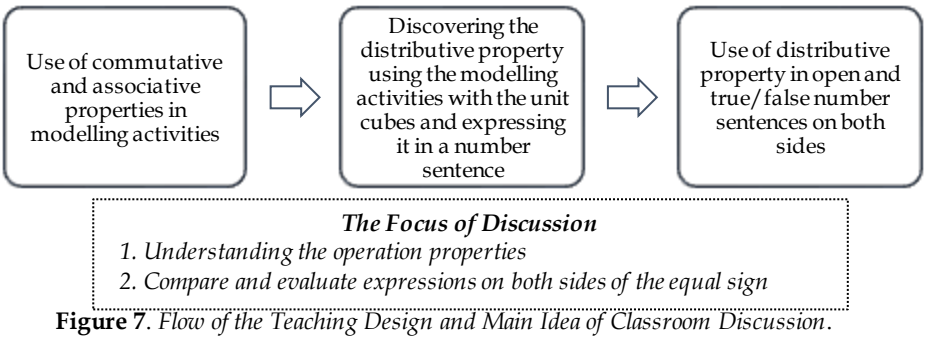


Figure 7. *Flow of the Teaching Design and Main Idea of Classroom Discussion*.

Next, the students were directed the question of "There are 10 biscuits in one package of biscuits. 20 packages of biscuits are placed in a box. You can put a total of 25 boxes in one parcel. Accordingly, could you write the sentence that will show the number of the biscuits in one parcel?", and a related in-class discussion was held:

Teacher	: Well, I don't want you to find the result. I just want to see the number sentence.
Semih	: We multiply 10 by 20, and it makes 200. So, it makes one package.
Hakkı	: No, it is a box.
Semih	: Next, we multiply 200 by 25.
Teacher	: Why?
Semih	: As one parcel can include 25 boxes, I have multiplied it by 25. The result is 5000.
Teacher	: Is there anyone to do a different operation?
Hakkı	: We can first multiply 20 by 10 and then 25 by 200.
Ozan	: Teacher, he means we can change their places.

The teacher wrote the operations of (20x10)x25 and (10x20)x25 side by side and asked the students whether these sentences reminded them of anything from previous lessons. The students stated that the commutative and associative properties were used.

In the follow-up activity, all the students were given a square prism with the top open, and each of them was distributed 32 unit cubes. First, the students were asked how to place the unit cubes. In this phase, the unit cubes in different colors were chosen to let the students discover the distributive property. As can be seen in Figure 8, the teacher first showed the unit cubes placed differently by two of the students. Following this, the teacher asked the students how they could find the number of the total unit cubes. All the students stated that the cubes were placed differently and that the total numbers of the cubes were equal. The students wrote the related number sentences. An example for the in-class discussions regarding the number sentence of (4x4)x2=(2x4)x2x2 was as follows:

Figure 8. *Photos from the Fifth Session.*

Hakkı : Here, we can put four unit cubes on one side of the bottom of the box and another four on the other side of the bottom. As the surface area, 4 multiplied by 4 makes 16. Then, we multiply it by 2, and the result is 32.

Teacher : Well, can we do the same operation, or a different one?

Semih : We can multiply 2 by 4, and it makes 8.

Ozan-Semih: Then we multiply it again by 2.

Semih : 16. I mean it is because there are different colors. We multiply 16 by 2, and it makes 32. I mean because I used two-unit cubes twice and because I have divided into two halves, I multiply 2 by 4 and get 8. Then, I multiply 8 by 2, and it makes 16. As the others (referring to the second floor) are the same, I multiply it by 2.

Next, for the purpose of allowing the students to discover the distributive property, the teacher asked them how many unit cubes there were in total. Here, the students recognized that the total numbers of the unit cubes in two boxes were equal and managed to write the equalities of (4x4)x2=(2x8)+(2x8)=2x(8+8):

İrem : Teacher, I will say the same thing again. There are 4 times 8 unit cubes (the total number of yellow and orange cubes)

Salih : Adding 8 to 8 means multiplying 8 by 2. Thus, when multiplied by 2, it makes two 8s. It is the same to multiply it by 2 and add 2.

Teacher : Well, what would be the name of this property?

Semih : It is the property of cancelation.
Teacher : You are almost right.
Gaye : Decomposition
Teacher : We call this property the distributive property.

The teacher-directed different questions by changing the number of factors with the unit cubes and changing the numbers of the colored cubes to examine the students' ability to use the distributive property. Following this, in-class discussions were held regarding the true/false number sentences on both sides like 5x(6+7)=(5x6)+(5x7), (3x4)+(1x4)=4x4, 8x4=(4x4)+(4x4), (8x3)+(8x1)=8x4 and open number sentences on both sides like 6x(8+7)=(6x…)+(6x7), …x(2+3)=(…x2)+(…x3), (3x8)+(4x…)=7x8, 4x(18+2)=(4x□)+(Δx2) involving the use of the distributive property.

Relational Thinking in Division

Figure 9 presents the teaching flow of the last session, in which the students were given the problem of "The numbers of the triangle pyramids and of the square prisms are equal. The total face number of the square prisms is 36. Now please find the number of the faces of the pyramids."

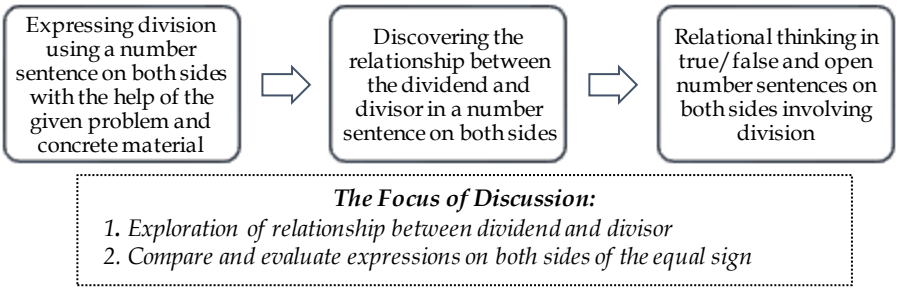


Figure 9. *Flow of the Teaching Design and Main Idea of Classroom Discussion*.

The students were asked to examine the face numbers of the triangle pyramids and square prisms brought into class. They were expected first to find the number of the prisms and then to find the face number in the pyramids with the help of the equality of the numbers of the prisms and pyramids. Depending on the result they found, in-class discussion was held regarding whether it was possible to write the equality of "24:4=36:6", and the data were transferred to table t.

Teacher : How many faces does a square prism and pyramid have?
Students : 6 and 4.
Teacher : The total face number of the square prism is given as 36. Then, how many prisms are there?
Semih : 6.
Teacher : How did you find that 6?
Semih : It has 6 faces, and I divided 36 by 6.
Teacher : You divided 36 by 6 (writes 36:6 on the board). What do think about the other?

Semih : I multiplied 6 by 4, and I found the face number of the pyramids.
Teacher : Well, in 36:6, 6 is the number of faces, and the result is the number of prisms. The numbers of the triangle pyramids and of the square prisms are equal, so we can write the face number of the triangle pyramid on the right side of the equality, right?
Students : Yes.
Teacher : Then, if write 36:6=□:4, what is the number we can put in the box?
Semih : To make it equal, it is 24.
Teacher : How can you find it without any calculation? Just consider it like table t.

Total face number	*Number of objects*
36	*6*
?	*4*

Students : 24
Teacher : Now, it is much easier, right? Why?
Ozan : Here (the first line), it is 6 times more. In the other one (the second line), it should be 6 times more, too. Thus, it is 24.

The session continued with open number sentences which aimed to develop relational thinking in division (for example; 10:2=5:…, 66:…=22:2, 350: 14=50:…).

10:2=5: …
İrem : 1
Teacher : Why?
Students : Because, teacher, here, 2 times 5 is 10. It was divided by 2. Now, 10 was divided by 2, and it made 5. I divided 2 by 2, and it made 1.
Teacher : Very good.
Hakkı : 5 is half of 10. To maintain the equality, it should be half of 2. I mean it should be 1.

In an open number sentence like ka:b=a:□ exemplified above, the students stated that the relationship (k) between the dividends could also be established between the divisors and that the number to be put in the box should be b/k. The session ended with the open number sentences like 60:□=20:Δ, which had more than one answer and with the true/false number sentences like 10:(5:5)=(10:5):5, which aimed to evaluate whether the commutative-associative properties were valid in the division.

Discussion, Conclusion and Recommendations

Relational thinking, which could be associated with the relational meaning the equal sign, is a skill that can be developed using teaching based on the generalized arithmetic approach at the level of secondary school fifth grade. This situation was also determined previously using the clinical interviews held before and after the teaching process carried out in the first phase of the present study (Kızıltoprak & Yavuzsoy Köse, 2017). Relational thinking not only covers numbers, operations and relationships

between operations but also requires understanding and effectively using the fundamental properties of operations. Therefore, relational thinking involves basic mathematical ideas regarding the development of students' algebraic thinking. This capacity of relational thinking also made it necessary to examine the teaching process, which constituted the second phase of the present study. Accordingly, the most general result was that at the end of the teaching process based on numbers, relationships between numbers, operations and properties of the operations, the students made use of equality axioms to evaluate the true/false and open number sentences without any calculation. Parallel to the results of other studies carried out to develop primary school third-grade students' relational thinking using teaching processes (Carpenter et al., 2003; Koehler, 2004; Molina, Castro & Ambrose, 2005), the present study revealed that the students managed to make use of relational thinking while evaluating and solving the given true/false and open number sentences at the end of the teaching process. It was also seen that the students made connections between addition-subtraction, addition-multiplication and multiplication-division and that they made effective use of commutative, associative and distributive properties.

In the relevant literature, there are many studies that showed that students perceive the equal sign as a command for the application of arithmetic operations and they thus consider the equal sign to have an operational meaning (Sáenz-Ludlow & Walgamuth, 1998; Yaman, Toluk & Olkun, 2003; McNeil & Alibali, 2005; Matthews & Rittle-Johnson, 2009; Byrd et al., 2015; Rittle-Johnson et al., 2011). Given that students encounter mostly with the operational meaning of the equal sign not only in their textbooks (Seo & Ginsburg, 2003; Köse & Tanışlı, 2011) but also in their in-class learning process (Carpenter et. al., 2003) makes it more difficult to understand the concept of equality. To overcome this difficulty and to let students understand the concept of equality, teaching processes in the phase of introduction to the concept and then in the phase of transition to addition could be beneficial. In relation to this, Seo and Ginsburg (2003) reported that teachers could use rods and coins to contribute to students' views about equality. Researchers point out that in an activity involving the use of rods, the relational meaning could be attributed to numbers, operations and equality. With the help of this approach, in the first session of the teaching process, the students were able to recognize the related changes in the number sentences by modeling addition with Cuisenaire rods and by showing the number sentences in table t. To clarify this better, it could be stated that using table t, the students were able to represent the number sentences whose sum was 30 and which they modeled with Cuisenaire rods. Also, the students were thus able to recognize that the increases and decreases between the two addends were equal. Thinking over correct number sentences not only helps students see number sentences as a whole but also supports the relational meaning of the concept of equality (Molina & Ambrose, 2008). In the first session, in the activity involving use of Cuisenaire rods, which was used as the introductory activity, transition from true number sentences involving addition to the maintenance of equality was a planned transition to support the relational meaning of the concept of equality. Thus, it was an important starting point that at the end of the

first session, the students used expressions like "scale, balance, equality on both sides" regarding the concept of equality.

In the second session of the teaching process, subtractions were modeled using unit cubes, and all the students correctly expressed the minuend, subtrahend and difference. In a number sentence like 30-a=b, the students recognized the change between the subtrahend and the difference by keeping the minuend constant. In the follow-up activity, the students were asked to model different subtractions which they themselves formed with unit cubes and to show the number of sentences related to these operations in table t. The students recognized that the difference decreased/increased when they increased/decreased the subtrahend in the number sentences (they showed in table t) in a certain pattern. The students thought in that way because they examined their true number sentences two by two (for example, 30-1=29 and 30-4=26; 22-1=21 and 22-2=20). In other words, the students related the change in the difference to the change in the subtrahends in the true number sentences two by two. This process also contributed to the students' relational thinking while evaluating the true/false number sentences on both sides involving subtraction. In this way, the students agreed that equality was maintained by keeping the difference constant in a number sentence on both sides involving subtraction. Therefore, during the in-class discussions, the students reported that the difference (2) between the minuends (10 and 8) for the number sentence of 10-5=8-3 should be equal to the difference (2) between the subtrahends (5 and 3). The in-class discussions regarding especially the true/false number sentences supported the students' analysis of the given number sentences from a holistic perspective without doing any calculation. This result is consistent with the results of another study carried out with primary school third-grade students by Molina and Ambrose (2008), who pointed out that the relational meaning of the equal sign is supported by the teaching process. The researchers reported that the true/false number sentences they used in their teaching process helped develop the students' understanding of the relational meaning of the equal sign and allowed their transition from the computational approach to the structural/analytical approach. In the present study, following the true/false number sentences involving subtraction in the second session, the students were given open number sentences. The students managed to generalize not only the maintenance of the difference between the minuends and subtrahends in the true/false number sentences but also the number sentence on both sides, and they even achieved relational thinking in more complex number sentences. Carpenter et al. (2003) claim that discussions regarding true/false and open number sentences are fairly beneficial for students' understanding of the equal sign. This claim put forward by the researchers is also supported by the related findings obtained in the present study. The sessions starting with true/false number sentences and the relational thinking strategies applied for the evaluation of these number sentences made it easy for the students to solve the open number sentences without doing any calculation.

Understanding the relationship between addition and multiplication allows students to multiply with the help of their knowledge about addition (Carpenter et. al., 2003). Thus, in the third session of the teaching process, unit cubes and imitation

coins and banknotes were used to increase the degree of relating addition to multiplication and to understand multiplication. In this process, the number sentences of "24x1=12x2=6x4=8x3" and "20x1=4x5=2x10=1x20" were given to the students together with the table t used in the previous sessions. The students developed different thinking strategies using the table t, focused on the relationship between the factors and mentioned the commutative property. In addition, some of the students began to establish relationships between the dividend, divisor and quotient in the number sentences in table t and thus established relationships between multiplication and division. Given that the students were able to recognize and establish all these relationships thanks to table t was an important finding obtained in the present study. In the third session, another striking result was obtained through an open number sentence on both sides involving two unknowns like 13x10=(10x □)+Δ. Number sentences involving two unknowns like 18+(Box A)= 20+(Box B) could direct students towards relational thinking (Stephens & Ribeiro, 2012). In one study, Napaphun (2012) found that open number sentences involving one unknown and two unknowns developed students' relational thinking skills. Molina and Ambrose (2006) point out that asking students to form true number sentences in the form of …+…=…+…; …−… =…−…; …+…=…−… could be fairly beneficial for clarifying and consolidating their relational understanding. Parallel to these results, in the present study, the students formed different number sentences using relational thinking in open number sentences on both sides involving two unknowns. While forming these number sentences, the students, though they did not state it explicitly, made effective use of the commutative and distributive properties.

In the fifth session, the students were encouraged to recognize the commutative and associative properties with the help of true/false number sentences. When the students stated which operations were suitable for using these properties, they started to deal with related problems and modeling. Especially the distributive property used together with the associative and commutative properties plays a key role in the development of arithmetic (like mental calculations, algorithms, rules) and algebraic thinking (like the transformation of sentences, recognition of the equality relationship) (Malara&Navarra, 2006). In addition, unit cubes with different colours used in the teaching process to help the students discover the distributive property was fairly useful for the calculation of the square prism. This activity, which is basically used for the associative and commutative properties, contributes to the recognition of the distributive property. In the present study, the students made a direct transition from the equality of (4x4)x2=(2x4)x2x2 to the equality of 2x(8+8)=(2x8)+(2x8) without mentioning the distributive property. The students did relational thinking while writing these equalities in multiplication. This result is consistent with the results obtained by Carpenter, Levi, Berman and Pligge (2005), who reported in their study that especially primary school students intuitively use the distributive property in number sentences involving multiplication. Baek (2008) points out that the third and fifth-grade students who understood especially the associative and distributive properties of multiplication were successful in solving verbal multiplication problems involving multi-digit numbers. As another important finding obtained in the present study, the students stated that the equalities of (a+b)xc=(axc)+(bxc) they formed based

on the square prisms were correct, and they effectively used the distributive property as well as the associative and commutative properties in open number sentences.

In the light of the results obtained in the present study, with the help of appropriate teaching environments and thanks to the in-class discussions guided by the teacher, the students managed to give a relational meaning to the concept of equality. Depending on the results of the present study, which presented a teaching design, learning trajectories that aim to develop relational thinking could be developed and tested on different participants. Moreover, studies could be designed on elementary school teachers' teaching processes regarding the concept of equality. In the present study, the findings suggest that tables t were considerably influential on evaluating the number of sentences based on relational thinking. In this respect, mathematics teachers and especially elementary school teachers could use table t to show the arithmetic operations and the related number sentences which they provide in problem contexts and which they have modeled with various concrete materials. In this way, the relationships between the numbers discovered in table t could be related with operations. In this study, the focus was especially on the distributive property of multiplication over addition and multiplication. On the other hand, examples like 184:8=(80+80+24): 8= (80:8)+(80:8)+(24:8) or 180: 6=(120:6)+(60:6) involving different usage of the distributive property were out of the scope of the present study. In this respect, further research could examine which strategies students use especially in division within the context of relational thinking.

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Ortaokul Öğrencilerinin İlişkisel Düşünme Becerilerinin Bir Öğretim Deneyi Aracılığıyla Geliştirilmesi

Atıf:

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Özet

Problem Durumu: Literatürde pek çok araştırmacının eşit işaretinin anlamı ve eşitlik kavramı üzerine yoğunlaştığı görülmektedir. Bu araştırmacılar arasında eşit işaretinin ilişkisel anlamını oluşturmada öğrencilerin eğilimlerinin işlemsel anlama yönünde olmadığı aksine bu durumun kavramlara ilişkin öğretim süreçlerinin bir yansıması olarak oluştuğu konusunda ortak bir uzlaşma söz konusudur (Stephens, Ellis, Blanton &Brizuela, 2017, s. 391). Bu ortak uzlaşı araştırmacıları, eşit işaretinin ilişkisel anlamının oluşturulmasında ve ilişkisel düşünmenin geliştirilmesinde öğretim süreçlerinin nasıl olması gerektiğine doğru yöneltmiştir. Küçük yaşlardaki öğrenciler ile gerçekleştirilen çalışmalarda, genellenmiş aritmetik yaklaşımını içeren erken cebir öğretimi aracılığıyla öğrencilerin temel işlemlerin ve değişme özelliği gibi işlem özelliklerinin farkına varmada önemli kazanımlar sağladıkları, genel olarak sayılara, işlemlere ve işlem özelliklerine ilişkin muhakemelerinde farklı düşünme yolları ürettikleri, hatta çeşitli genellemelere ulaşabildikleri belirlenmiştir (Carpenter vd., 2003; Bastable&Schifter, 2008; Blanton vd., 2015; Steinweg vd., 2018). Literatür incelendiğinde eşit işaretinin ilişkisel anlamına ve ilişkisel düşünmenin geliştirilmesine yönelik öğretim süreçlerini inceleyen araştırmaların ağırlıklı olarak okulöncesi ve ilkokul düzeyinde olduğu, ortaokul düzeyindeki öğrencilere ilişkin araştırmaların sınırlı (Napaphun, 2012) olduğu söylenebilir. Oysaki aritmetikten cebire geçişin sağlandığı ortaokul 5. sınıf düzeyi öğrencilerin düşüncelerinin geliştirilmesinde kilit bir düzey olarak ele alınabilir. Öğrencilerin ilişkisel düşünmeyi geliştirici bir öğretim süreci aracılığıyla muhakemelerinin ve düşünme yollarının ortaya çıkarılması önemlidir. Bu bağlamda bu çalışmada gerçekleştirilen öğretim sürecini incelemek amaçlanmış, öğrencilerde ilişkisel düşünmenin geliştirilmesinde işlem özelliklerinin nasıl kullanıldığı, hangi somut materyallerin ele alındığı etkinlik örnekleri ve sınıf içi tartışmalar ile detaylı olarak sunulmuştur.

Araştırmanın Amacı: Bu araştırma ile ortaokul 5. sınıf öğrencilerindeki ilişkisel düşünme becerisinin nasıl geliştirilebileceğinin incelenmesi amaçlanmaktadır. Bu amaç doğrultusunda "Öğrencilerdeki ilişkisel düşünme becerisinin geliştirilmesinde sayı cümleleri ve işlem özellikleri nasıl kullanılmaktadır?" sorusuna yanıt aranmıştır.

Araştırmanın Yöntemi: Öğrencilerdeki ilişkisel düşünme becerisinin geliştirilmesinin incelendiği bu araştırmanın deseni öğretim deneyidir. Araştırmanın katılımcılarını; Eskişehir ilindeki orta düzey olan bir devlet okulunun 5. sınıfında öğrenim gören 6

öğrenci oluşturmaktadır. Öğretim öncesi sınıf içi gerçekleştirilen gözlemlerde öğrencilerin eşit işaretinin farklı anlamlarını söylemekte zorlandıkları ve eşitliği bir işlemin sonucunu bulma olarak kullandıkları belirlenmiştir. Öğrencilerin aritmetik işlemleri içeren sayı cümlelerinde sayılar ve işlemler arasında bir ilişki kurmaksızın hesaplamaya dayalı düşündükleri, değişme, birleşme ve dağılma özelliklerini fark etmedikleri, özellikle bölme işleminde zorlandıkları görülmüştür. Bu bağlamda öğrencilerin ilişkisel düşünme becerilerinin gelişimini amaçlayan bir öğretim süreci planlanmıştır. Gerçekleştirilen öğretim süreci her hafta 1 oturum olacak şekilde 8 oturum/8 hafta olarak gerçekleştirilmiştir. Öğrencilerin yaş düzeyleri göz önüne alınarak oturumlar 30-40 dakika olacak şekilde planlanmış, gerek duyulduğunda oturumlara ara verilmiştir.

Araştırmanın Sonuçları ve Öneriler: Bu araştırmadan elde edilen en genel sonuç sayılar, sayılar arası ilişkiler, işlemler ve işlem özelliklerine dayalı bir öğretim süreci sonunda öğrencilerin doğru/yanlış ve açık sayı cümlelerini hesaplama yapmadan eşitlik aksiyomlarından yararlanarak değerlendirebilmeleridir. Araştırmada öğrenciler öğretim süreci sonunda verilen doğru yanlış ve açık sayı cümlelerini değerlendirmede ve çözmede ilişkisel düşünmüşlerdir. Öğrencilerin toplama-çıkarma, toplama-çarpma, çarpma-bölme işlemleri arasında ilişkilendirme yapabildikleri ve değişme, birleşme ve dağılma özelliklerini etkili bir biçimde kullanabildikleri görülmüştür.

Öğrencilerin eşit işaretini aritmetik işlemlerin uygulanması için bir komut gibi algılamaları ve dolayısıyla gerek ders kitaplarında gerekse ön öğretimlerinde eşit işaretinin işlemsel anlamı ile karşılaşmaları eşitlik kavramının anlaşılmasını zorlaştırmaktadır. Bu zorluğun üstesinden gelebilmede ve eşitlik kavramının kazandırılmasında kavrama ilk girişteki ve ardından toplama işlemine geçişteki öğretim süreçleri çare olabilir. Öğretimin ilk oturumunda mikado çubukları ile toplama işleminin modellenmesi ve sayı cümlelerinin t tablosunda gösterilmesi aracılığıyla öğrenciler sayı cümlelerindeki ilişkili değişimi fark etmişlerdir. Oturumda, giriş etkinliği olarak seçilen mikado çubukları etkinliğinde toplama işlemindeki doğru sayı cümlelerinden eşitliğin korunumuna geçilmesi eşitlik kavramının ilişkisel anlamının desteklenmesi için gerçekleştirilmiş planlı bir geçiştir.

Öğretimin ikinci oturumunda çıkarma işlemleri birim küplerle modellenmiş, öğrencilerin tamamı eksilen, çıkan ve farkı doğru ifade etmişlerdir. Öğrencilerden etkinliğin devamında, birim küplerle kendi oluşturdukları farklı çıkarma işlemlerini modellemeleri ve bu işlemlere ait sayı cümlelerini t tablosunda göstermeleri istenmiştir. Öğrenciler t tablosunda gösterdikleri sayı cümlelerindeki çıkanı örüntüsel bir şekilde arttırdıklarında/azalttıklarında farkın da azalacağını/artacağını fark etmişlerdir. Bu düşüncenin gelişmesinde öğrencilerin oluşturdukları doğru sayı cümlelerini ikişerli olarak incelemeleri (örn. 30-1=29 ve 30-4=26) etkili olmuştur. Diğer bir ifade ile öğrenciler ikişerli ele aldıkları doğru sayı cümlelerinde çıkanların değişimi ile farkın değişimini ilişkilendirmişlerdir. Sınıf içinde özellikle doğru/yanlış sayı cümleleri ile ilgili tartışmalar öğrencilerin verilen sayı cümlelerini hesaplama yapmadan bütüncül bir bakış açısıyla analiz etmelerini desteklemiştir. Öğrenciler doğru/yanlış sayı cümlelerinde ulaştıkları eksilenler ve çıkanlar arasındaki farkın korunumuna ilişkin genellemeyi çift taraflı açık sayı cümlesine genişletmişler, hatta

daha karmaşık sayı cümlelerinde ilişkisel düşünebilmişlerdir. Oturumlara öncelikle doğru/yanlış sayı cümleleri ile başlanması, bu sayı cümlelerinin değerlendirilmesinde kullanılan ilişkisel düşünme stratejileri öğrencilerin açık sayı cümlelerini hesaplama yapmadan çözmelerini kolaylaştırmıştır.

Öğretimin üçüncü oturumunda toplama ve çarpma işlemleri arasındaki ilişkilendirmenin arttırılması ve çarpma işleminin anlamlandırılması için birim küpler ve oyun paraları kullanılmıştır. Öğrenciler t tablosu aracılığıyla farklı düşünme stratejileri geliştirmişler, çarpanlar arasında kat ilişkisine odaklanmışlar ve değişme özelliğini kendileri ifade etmişlerdir. Ayrıca bazı öğrenciler t tablosundaki bu sayı cümlelerinde bölünen, bölen ve bölüm arasında ilişkilendirme yapmış ve dolayısıyla çarpma ve bölme işlemleri arasında da ilişki kurmuşlardır. Tüm bu ilişkilerin fark edilmesinde ve kurulmasında t tablosunun oldukça etkisi olması araştırmada ulaşılan önemli sonuçlardandır. Oturumdaki en dikkat çekici sonuçlardan bir diğeri ise 13x10=(10x □)+Δ gibi iki bilinmeyen içeren çift taraflı bir açık sayı cümlesinde ortaya çıkmıştır. Öğrenciler, iki bilinmeyen içeren çift taraflı açık sayı cümlesinde ilişkisel düşünerek farklı sayı cümleleri oluşturmuşlardır. Bu sayı cümlelerini oluştururken öğrenciler ifade etmeseler de değişme ve dağılma özelliklerini etkili biçimde kullanmışlardır.

Beşinci oturumda ele alınan değişme ve birleşme özellikleri doğru/yanlış sayı cümleleri ile fark ettirilmeye çalışılmış, öğrencilerin bu özelliklerin hangi işlemler için geçerli olduğunu belirtmeleri ile birlikte problemlere ve modellemelere geçilmiştir. Öğretim sürecinde dağılma özelliğinin keşfi için farklı renklerde kullanılan birim küpler ile kare prizmanın hacminin hesaplaması son derece etkili olmuştur. Özellikle öğrencilerin (a+b)xc=(axc)+(bxc) eşitliklerinin doğruluğunu savunmaları ve ardından açık sayı cümlelerinde birleşme ve değişme özellikleri ile birlikte dağılma özelliğini de etkili bir biçimde kullanmaları ulaşılan diğer önemli sonuçlardandır.

Araştırmadan elde edilen sonuçlar ışında, uygun öğretim ortamları ve öğretmenin sınıf içi tartışmaları aracılığıyla öğrencilerin eşitlik kavramına ilişkisel bir anlam yükleyebildikleri görülmüştür. Bir öğretim tasarımı sunan bu araştırmanın sonuçlarına dayalı olarak ilişkisel düşünmeyi geliştirici öğrenme yörüngeleri geliştirilebilir ve farklı katılımcılar üzerinde test edilebilir. Hatta sınıf öğretmenlerinin eşitlik kavramına ilişkin öğretim süreçleri üzerine araştırmalar desenlenebilir.

Anahtar Sözcükler: Matematik eğitimi, ilişkisel düşünme, eşitlik, eşit işareti.

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The Relationship between Knowledge Management and Organizational Learning with Academic Staff Readiness for Education 4.0

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ABSTRACT

Purpose: Education 4.0 paves the way for a new form of the university where academicians teach, research and provide services in different ways, which raises the question of the readiness of academicians to face the challenges. This study attempts to explain to which extent the university and its academic staff are ready to face Education 4.0 challenges through the initiatives of knowledge management and organizational learning.

Research Methods: Questionnaires were administered to all academic staff in one education university in Malaysia and 218 completed questionnaires were received and analyzed in this study. Data were collected using modified items from two sources to measure knowledge management and organizational learning practices at the university. Items for measuring staff readiness for Education 4.0 were developed based on criteria found in the recent literature. Descriptive and inferential statistics were used to analyze the data.

Findings: Results indicated that the academic staff and the university were ready to face the Education 4.0 challenges. The level of organizational learning practiced by the academic staff is high, the same as the knowledge management practiced by the university. Pearson's correlation analysis showed that both organizational learning and knowledge management practices had significant positive relationships with the readiness of academic staff for Education 4.0. However, multiple regression analysis with stepwise procedures found that only one knowledge management practice and one organizational learning practice were the predictors of the readiness of the academic staff in facing the Education 4.0 challenges.

Implications for Research and Practices: This study provides new insight into Education 4.0 through the perspective of knowledge management and organizational learning. Universities need to put more initiatives for knowledge creation, knowledge organization, knowledge storing, knowledge dissemination and knowledge application. Furthermore, academicians also need to put more effort into supporting new learning and ideas, formal learning and external/interface learning.

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Introduction

The excitement of arguing, debating and discussing the Fourth Industrial Revolution (4th IR) by Schwab (2016) led to the exploration of the idea in the field of education. Education 4.0 is born from the observation of educational thinkers that 4th IR will bring a new wave to the world, not only in the field of the industry but also a huge impact on education. Hence, various assumptions are made about how teachers and academics can adapt to the changes brought about by Education 4.0. Education 4.0 is to meet the needs of an innovative society. Learning in the era of this 4th IR supports every individual to equip themselves with their best ability.

Abersec (2017) stated that Education 4.0 produced new challenges in education. The challenge is marked by two big requests in the 4th IR, a new way of solving problems and new thinking methods. It is important to understand the effects of this change as it involves the use of various new learning tools that are still being explored to date. Therefore, Education 4.0 is not just about mastering the basic deep core knowledge. In fact, Education 4.0 provides unlimited opportunities for multiple learning at all times. Learning and knowledge of this era is a new learning system that enables every individual to acquire knowledge and skills for a lifetime.

This learning system helps to develop the individual's ability to apply new technologies, which enable them to adapt to changes in the working environment. Therefore, organizational learning (henceforth referred to as OL) must respond to the changing social and economic environment to meet these human capital requirements. Conventional learning provides knowledge and skills to start a career yet organizational learning provides life-long learners. Knowledge management (henceforth referred to as KM) helps in building and developing individual potentials and providing them with the ability to be creative and innovative.

Knowledge Management (KM) and Organizational Learning (OL)

The concept of KM was introduced around 1990s. Drucker (1993) coined the knowledge-intensive organizations (KIOs) term based on related studies on knowledge workers and the rapid development of information technology. Most of KM definitions are based on the process. The processes often incorporated into KM definition are the access and creation of knowledge, knowledge use and dissemination (Nonaka & Takeuchi, 1995). Liebowitz (2000) added processes such as identification, acquisition, storage, sharing, application and sale of knowledge. In further discussion, Bhatt (2001) argued that the second generation of KM shifts from managing knowledge to creating new knowledge. Thus, Lin (2014) and Teece (2014) added another string to the list – generate, facilitate, integrate, nurture, transfer and knowledge protection in defining the KM. Looking further, Castaneda (2015) added state-of-the-art processes, such as electronic transfer, face-to-face sharing and reuse of knowledge.

The growing interest in KM related field – OL opened up long debates among researches for more than twenty years. Cyert and Mac (1963) proposed the OL concept in the context of the decision-making model. However, the term "organizational

learning" was first used by Cangelosi and Dill (1965) in their research title. OL began to grow as a field of study after Argyris and Schon (1978) introduced single and double-loop learning, followed by a few more studies, such as Shrivastava (1981) who discussed learning system and Fiol and Lyles (1985) who discussed the level of learning within the organization.

This basic concept was explored until the 1990s when Argote and Epple (1990) described the learning curve, while Weick (1991) discussed the frequency of learning and the shape of OL. Mac (1991) widened the border of learning to knowledge activities in which he studied the exploration and exploitation of knowledge. Meanwhile, Huber (1991) extended his research on OL services, such as knowledge acquisition, information distribution and interpretations and came to the term with organizational memory. The Community of Practice (CoP) – a term prominently used in KM was discussed by Brown and Duguid (1991) in relationship with OL. Undoubting that OL is a key area in organizational management research (Bapuji & Crossan, 2004), Argote and Miron-Spektor (2011) affirmed that OL has three sub-processes consisting of creating, maintaining and transferring knowledge, which has been included as part of KM. The KM and OL KM literature have grown significantly from this foundation.

Research conducted by Massingham (2014a) based on the ProQuest database for 1996-2009 found six most frequent themes in KM and OL. He concluded that since 2008, OL and KM have moved towards integrating learning concepts and practices. Parts of the topics were knowledge acquisition, learning creation and learning models are part of it. Hence, Massingham (2014b) suggested that OL and KM be sub-concepts in the learning organization (LO). However, Newman and Newman (2015) pointed out that LO is not a broad category that can include OL and KM but instead, OL focuses on processes and practices, while KM emphasizes on the content, practice and process of OL and theory. The debate between KM, OL and LO will never end. The term used may differ, but they are related and exist by supporting each other. OL needs a good practice of KM to develop an excellent LO.

Education 4.0

There are currently not many researches that can be referred to in Education 4.0 as it is among the agendas that are still under discussion. Among the many discussions, innovations and general transitions in the learning world, Fisk (2019) suggested nine prominent learning trends in Education 4.0: 1) diverse time and place of learning, 2) personalized learning, 3) free choice, 4) project-based learning, 5) field experience, 6) data interpretation, 7) changes in examination, 8) students ownership and 9) mentoring programs. First, learning can take place anytime and anywhere as Fisk (2019) noted as diverse time and place of learning. Students will have more opportunities to learn at different times in different places. The e-Learning tool facilitates learning opportunities from far-off places with the adaptation of student's self-esteem capabilities. Flipped Classroom will be the practice where the theoretical part is learned outside of the classroom, while the practical part is taught face-to-face and interactive. In personalized learning (Fisk, 2019), students learnt with the learning

tools tailored to their abilities. This means that students will be challenged with more difficult questions and tasks when certain levels are reached. Students who are having problems with the subject will have the opportunity to practice more so that they reach the required level. Students will be guided and assisted during their personal learning process. This can result in a positive learning experience and will reduce the number of students who lose their confidence due to low academic achievement. Additionally, academicians will be able to identify and provide appropriate assistance to students who need help in any field. Third, students have their own choice of learning tools. Although each subject being taught has the same purpose, students can modify their learning process with learning tools that they feel are appropriate. Students will learn with different devices, programs and techniques based on their own priorities. Blended learning, flipped classroom and BYOD (Bring Your Own Device) form important terms in this change. Another trend propose by Fisk (2019) was Project-Based Learning. By adapting to project-based and work-based learning, students learn how to apply their skills in various situations. Field experience (Fisk, 2019) provides the students with skills that only require human knowledge and face-to-face interaction. Educational institutions should provide more opportunities for students to acquire skills to bring into their workplace. New trends in Education 4.0 looked into students' assessment differently. Students' competency measured through question form and the only answer may be irrelevant and insufficient. The application of their knowledge is better tested when they work on field projects. Furthermore, students' opinions will be considered in designing and updating the curriculum. This is what Fisk (2019) considered as students' ownership. Lastly, as students will become more independent in their own learning, teachers should assume a new role as facilitators to guide the students through their learning process.

Higher education institutions in 4th IR not only focus on producing knowledge-based skilled workers but also targets innovative talents, especially scientists and high technology experts. Blended learning will be a learning method implemented at every level of learning. In the field of research, more multi-dimensional innovations will be generated. The innovation will also be more evolutionary and revolutionary. Revolution innovation focuses on the discovery of new technologies, while evolution innovation introduces new research directions (Xing & Gao, 2014). The new technological advancement such as University-as-a-Platform (UaaP), Education-as-a-Service (EaaS) as well as Internationally-linked Programs is among the services that will be offered by universities to support and encourage more research as well as shorten the innovation cycle (Xing & Marwala, 2017.) However, checks in four large journal publishers with keywords Education 4.0, 4th IR and academicians found insufficient researches in the area. Literature related to readiness for 4th IR or Education 4.0 among academicians cannot be found anywhere. This raises the question of the readiness of academicians to face the Education 4.0 challenge. Furthermore, the question arises as to what initiatives can be taken by universities and academic staff in preparing them for the challenge. This study attempts to explain to which extent the university and its academic staff ready to face Education 4.0 challenges through the initiative of KM and OL. Therefore, the following research questions were developed:

1. Are the academic staff ready to face the challenge of Education 4.0?

2. What is the level of KM practices in the university?

3. What is the level of OL practices among academic staff?

4. Is there any significant relationship between academic staff readiness for Education 4.0 with KM practices?

5. Is there any significant relationship between the academic staff readiness for Education 4.0 with OL practices?

Method

Research Design

This study used a quantitative approach with a survey research design. This research was conducted in the one and only education university in Malaysia to measure the level of readiness of the university and its academic staff in facing the challenge of Education 4.0. The university was selected because it is the only education university in Malaysia. The university's vision to become a leading education university in the Asian region demanded a very strong argument that the university and its academic staff should be prepared to face the challenges of Education 4.0 in the 4th IR.

Research Sample

No sampling process was planned for this study. There were 835 permanent and contract academic staff at the university when this study was conducted. We distributed the questionnaires to all the academic staff using email. The email was blasted three times, one in August, then September and October. Two hundred and twenty-seven (227) of them returned the questionnaires, which means the return rate was about 27.2% from the total population. However, only 218 sets were completed and can be used in this study. Thirty-eight percent (38%) of the academic staff were males and the other 62 % were females. Eighty percent (80%) of them were Malays and the rest were Chinese (7.5%), Indians (5.3%) and other ethnic (7.2%). Fifteen percent (15%) of them were more than 55 years old, 26.1% were in the 46-55 age range, 38% in the range of 36-45 years old, and the rest (20.9%) were in the range of 26-35 years old. Meanwhile, most of them had around 1-10 years of experience as an academic staff (58.8%). Thirty-four percent had 11-20 years of experience, 6.4% had 21-30 years of experience and another (0.8%) had more than 30 years of experience.

Research Instrument and Procedures

Questionnaires were used to collect the responses from the respondents. The instrument consisted of four parts, Section A, B, C and D. Section A asked about respondents' demographic information. Section B consisted of 18 items measuring KM practices adapted from Ramachandran et al. (2009). The items comprising six knowledge management practices such as creating knowledge, capturing knowledge,

organizing knowledge, storing knowledge, disseminating knowledge and applying knowledge. Responses were measured using five-point Likert's Scales (1=strongly disagree, 2=disagree, 3= not totally agree, 4=agree, 5 strongly agree). Examples of statements in Section B are:

> *My institution has mechanisms for creating new knowledge from existing knowledge.*
>
> *My institution has mechanisms for filtering, cross-listing and integrating different sources and types of knowledge.*

Section C contained 22 items measuring OL. Items were adapted from Findlay et al. (2000). Items comprised four practices of organizational learning such as support for learning and new ideas, formal learning, external/interface learning and informal learning. Examples of statements in Section C are:

> *As part of my work, I am encouraged to meet and learn from people in different industries.*
>
> *I gain a lot of useful information about the best way of doing my job from other people in my institution.*

Items in section D used for measuring academic staffs' readiness for Education 4.0. Items were developed by researchers based on nine trends in Education 4.0 criteria by Fisk (2019). However, this research adopted only eight of these trends, leave out the data interpretation. Examples of statements in Section D are:

> *I allow students to use different devices, programs and techniques based on their learning preferences.*
>
> *I am willing to teach wherever the place is suitable for my students.*

Validity and Reliability

Two language experts helped with the translation of the items in the questionnaires. Another three subject matter experts (SME) help to validate the items. Reliability analysis using the internal consistency approach (Cronbach's Alpha coefficients) showed that the items were satisfactorily able to measure each variable. (knowledge management=.96, organizational learning=.95, readiness for education 4.0=.93)

Data Collection Procedure

Data collection procedures started from the process of obtaining permission from the University Registrar for the purpose of distributing questionnaires to all academicians. At the same time, the questionnaire was developed in the Google Forms to facilitate interaction and receive feedback from respondents. Forms were administered to all academic staff using an internal email network. Google Form allowed respondents to respond directly online. Of the 835 academic staff, only 227 responded to the email and 218 completed their survey forms. The emails were blasted

every month for three months consecutively as a soft reminder for those who have not yet responded.

Data Analysis Procedure

Data were analyzed using descriptive and inferential statistics to obtain the answer to the research questions. The software used for the analysis was IBM SPSS Statistics 23. For questions 1, 2 and 3, the data were analyzed using measures of central tendency, meanwhile inferential analysis used to find the answer for questions 4 and 5. After the data cleaning process, only 218 sets of data can be used. Some of the questionnaires were incomplete with missing scores, and some have a redundant responses. To determine the suitable types of statistics for the collected data, we run the normality test to analyze the distribution of data. The normality test showed that the data were skewed (Statistic of Skewness and Kurtosis out of +2 and -2 and Kolmogorov-Smirnov and Shapiro-Wilk test were significant). Normal Q-Q Plot showed there were some outliers in the group of data for academicians' readiness for Education 4.0 and OL practices. From the histogram, the outliers were identified and cleared from the dataset. The data that had been eliminated were from respondents number 11, 146 and 160. We conducted the second normality test. The Skewness and Kurtosis value became smaller (between +1 and -1) and Kolmogorov-Smirnov and Shapiro-Wilk Test showed both were not significant ($p>.05$). Therefore, we assumed that the data were normally distributed and proceeded with data analysis for the 215 sets of data (N=215).

Results

Academic Staff Readiness to Face Education 4.0 Challenges

The findings on the readiness of academic staff for Education 4.0 are shown in Table 1.

Table 1

The Level of Academic Staff Readiness for Education 4.0

Readiness for Education 4.0	Mean	Sd
Diverse time and place	4.08	.74
Personalized learning	4.20	.55
Free choice	4.26	.56
Project-based	4.25	.54
Field experience	4.20	.66
Changing in examination	4.25	.58
Students' ownership	4.20	.65
Mentoring	4.19	.60
Total	**4.20**	**.52**

Analysis in Table 1 showed that the level of academic staff readiness for Education 4.0 at the university was high (M=4.20, SD=.52). Of all the elements of Education 4.0, free choice (M=4.26, SD=.56) and project-based (M=4.26, SD=.54) had the highest mean. Meanwhile, diverse time and place got the lowest score (M=4.08, SD=.74).

The Level of KM Practices at the University

The findings on the level of KM practices at the university are shown in Table 2.

Table 2

KM Practices at the University

KM practices	Mean	Sd
Creating knowledge	3.71	.71
Capturing knowledge	3.75	.68
Organizing knowledge	3.67	.71
Storing knowledge	3.82	.65
Disseminating knowledge	3.80	.62
Applying knowledge	3.56	.71
Total	**3.72**	**.60**

Analysis in Table 2 showed that KM practices at the university were at a high level with (M=3.72, SD=.60). Of all these practices, storing knowledge was the highest practice (M=3.82, SD=.65). Meanwhile, applying knowledge was the lowest practice (M=3.56, SD=.71).

The Level of OL Practices among Academic Staff

The findings on the level of OL practices at university are shown in Table 3.

Table 3

OL Practices by Academic Staff of the University

Organizational learning	Mean	Sd
Support for learning and new ideas	3.71	.59
Formal learning	3.90	.54
Internal learning / interface	3.94	.53
Informal learning	4.04	.51
Total	**3.90**	**.49**

Analysis in Table 3 showed that the level of OL practices by the university's academic staff was high (M=3.90, SD=.49). Of all these learning activities, informal learning was practiced at a high level (M=4.04, SD=.51). Meanwhile, support for learning and new ideas had the lowest score (M=3.7, SD=.59).

Relationship between KM and Academic Staff Readiness for Education 4.0

The findings of the relationship between KM and the academic staff readiness for Education 4.0 at the university are shown in Table 4.

Table 4

Relationship Between KM and Academic Staff Readiness for Education 4.0

	N	**Pearson's Correlation (*r*)**	***Sig.***
Readiness for Education 4.0			
	215	. 313**	.000
KM			

** Correlation is significant at 0.01 level (2-tailed).

Pearson's correlation analysis in Table 4 showed that there was a significant and positive but weak relationship between KM practices in the university and the academic staff readiness for Education 4.0 (r = .313, p <.01).

Relationship between OL Practices and Academic Staff Readiness for Education 4.0

The findings about the relationship between OL practices by the academic staff and their readiness for Education 4.0 at the university are shown in Table 5.

Table 5

Relationship Between OL Practices and Academic Staff Readiness for Education 4.0

	N	**Pearson's Correlation (*r*)**	***Sig.***
Readiness for Education 4.0			
	215	. 325**	.000
OL			

** Correlation is significant at 0.01 level (2-tailed).

Pearson's correlation showed that there is a significant and positive but weak relationship between OL practices by the academic staff and their readiness for Education 4.0 (r = .325, p <.01).

The findings about which practices in KM and OL significantly predicted the readiness of university and its academic staff for education 4.0 presented in Table 6.

Table 6

Variable Predictors of the University and Academic Staff Readiness for Education 4.0

		Unstandardized Coefficients		Standardized Coefficients		
	Model	*B*	*Std. Error*	*Beta*	*t*	*Sig.*
1	(Constant)	2.11	.26		7.97	.00
	Informal learning	.52	.07	.51	7.99	.00
2	(Constant)	1.85	.27		6.73	.00
	Informal learning	.45	.07	.44	6.52	.00
	Capturing knowledge	.15	.05	.19	2.91	.00

a. Dependent Variable: Education 4.0

Multiple regression analysis with stepwise procedures found that only two practices were the factors that contributed to university and academic staff readiness for Education 4.0. The two practices were, capturing knowledge ($\beta = .19$, $p < .05$) and informal learning ($\beta = .44$, $p < .05$).

Discussion and Recommendations

Fourth IR produces a new form of university where academicians teach, research and provide services in ways that they have never experienced before. Based on the findings, this study concludes that the academic staff and the education university are ready to face the challenges of Education 4.0. They are ready to teach anytime anywhere (diverse time and place of learning), personalized teaching to each student (personalized learning), let the students choose their preferred style of learning (free choice), let the students learn through project-based (project-based learning) and gain experience through fieldwork (field experience). They are also ready to change the ways they assess the students (changes in examination), consider students' opinions in designing and updating the curriculum (students' ownership) and ready to assume themselves to a new role as facilitators. However, there are other new trends or challenges which are still emerging in Education 4.0. As has been discussed above, there is no clear picture of how Education 4.0 will change our education landscape in the future because of the rapid changing of education technology and the accessibility of the technology itself. The measurement will differ from time to time (Puncreobutr, 2016). There will be a lot of technology things based on intelligent technology that is

powered by artificial intelligence. However, for most of all we do agree with Xing and Marwala (2017) who insist that improving the quality of service in higher education can bring about a significant change in society. Technology is just an enabler. Human readiness and ability to use, explore and exploit the technology is our most concern in this digital and knowledge era.

The findings showed that KM had been practiced at a high level at the university. KM initiatives cover a lot of activities and the list is growing with new terms. The activities' focus moved from just capturing, organizing, storing and reusing or applying the knowledge to the process of upgrading the knowledge, unlearn and relearn new knowledge and creating new knowledge. This study found that KM mostly practiced by storing knowledge, the least practice is applying the knowledge. The result points out that much of the knowledge has been stored without being applied by academicians. By applying knowledge, new knowledge can be created. However, knowledge creating activities had been practiced successfully at the university. On that matter, we cannot agree more with Bhatt (2001) that the second-generation KM had moved from managing knowledge to creating new knowledge.

OL is well-practiced by academicians. The results confirmed that they do a lot of informal learning than other types of learning. Most of the academicians feel that they do not receive enough support in their learning and in presenting new ideas. This finding did not align with a recent definition of OL by Popova-Nowak and Cseh (2015), who define OL as a social process in which individuals participate collectively to reproduce and develop knowledge simultaneously. Moreover, the finding points out that the possibility of learning had been done informally by the individual, not in teams or groups. Such practice imparted risk to the knowledge gained by the individuals. It will be stored as tacit knowledge in the person's mind or it will lead to the wrong way. By learning, knowledge should be created, retained and shared throughout the organization as suggested by Argote (2011).

Conclusion and Recommendations

The findings showed that both KM and OL had a significant, positive, but weak relationship with the academic staff readiness in Education 4.0. Analysis of the variable predictors confirmed that only capturing knowledge in KM and informal learning in OL are the predictors for the readiness of the academic staff. These findings offer a wide range of discussions. Alas, to our knowledge, there is no related literature that can be found from the university database to explain this result. Furthermore, no research can be found to support the relationship either between OL and Education 4.0 or KM and Education 4.0. Thus, we conclude that Education 4.0 is still under-researched for now. Subsequently, the findings obtained in this study suggested that there is a significant and positive relationship between Education 4.0 and KM, which means that if KM practices increase, the academic staff readiness will increase accordingly. The same goes for OL. However, a weak relationship, added to the previous findings, indicated that only one practice in both KM and OL are the predictors for the staff readiness leads to another factor for staff readiness. Further

studies are needed to explore more of these unidentified factors. This research concluded that capturing knowledge activities and informal learning by the academic staff contributed to their readiness to face the Education 4.0 challenges. Therefore, we propose some KM initiatives that the university needs to work on, which are the initiatives for knowledge creation, knowledge organization, knowledge dissemination and most of all is knowledge application. In addition, academic staff also needs to encourage new learning and ideas within the university, extending formal learning as well as learning from other universities and industries through external and interface learning.

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Correlations between Teachers' Personality, Psychological Safety Perception and Teacher Voice*

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ABSTRACT

Purpose: The purpose of this study is to determine the level of the teacher's voice, and to examine the relationships between voice, five-factor personality traits and psychological safety.
Research Method: The study was conducted with a correlational survey model. The sample of the study consisted of 475 teachers in public primary schools. Three instruments were applied in the study; Employee Voice Scale, Quick Big Five Personality Test, and Psychological Safety Scale.
Findings: Results showed that the level of teacher's voice was at level "Often", and there were significant and positive correlations between agreeableness, extraversion, emotional stability and openness to experience, and teacher's voice; and also between psychological safety and teacher's voice; and lastly, between psychological safety and agreeableness and emotional stability.
Implications for Research and Practice: Significant and positive relationships were found between teacher voice, and psychological safety and personality while the strength of the relationships was low. Therefore, future studies might focus on other individual and organizational factors related to the teacher's voice.

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Introduction

As traditional management thinking and practice have evolved over the last century, superior-subordinate communication types, management styles, mutual sharing and achievement become important in institutional structures for employees and employers in terms of organizational structures, motivations, and sustainability. In this respect, the decision-making process, production and development of strategies are not carried out only by the employers, but with the participation of employees. Employee input is an essential information source to take precaution for potential problems or to improve organizations. It is also important for employees to be able to voice their ideas, opinions, suggestions, and criticisms about work-related issues. In the literature, employee voice is defined as employees' voicing personal ideas and opinions on work-related matters and their involvement levels in organizational decision-making processes to improve the workplace (Van Dyne & LePine, 1998; Folger & Martin, 1986). Morrison (2011) states that employee voice involves improving an organization, resolving an organizational or business-related problem, opposing injustice or mismanagement, providing feedback on an important strategic issue or expressing different opinions arising from the perspectives of individuals. The results of studies on organizational effects of employee voice show that employees' voluntary contributions to the organization with ideas and information on learning and improvement prevent problems arising from not having enough knowledge of top-management (Tangirala & Ramanujam, 2008). From an individual perspective, individual reduces stress by increasing auto-control and job motivation (Parker, 1993), and their belief that problems can be solved positively affects their attitudes towards their jobs (Morrison & Milliken, 2000) when they are able to express problems and concerns about the work comfortably. These results indicate that employee voice is an important concept for both individuals and organizations.

On the other hand, employees might not share their opinions in their workplace. Employees avoid explaining their ideas for certain reasons (Morrison & Milliken, 2000), and silence of the employees can be negative in terms of organizational performance (Edmondson & Roloff, 2009). Furthermore, their health might be affected both psychologically and physically when they cannot talk about the problems related to their jobs (Cortina & Magley, 2003), and these adverse effects may threaten organizational performance. Thus, it is stated that employee voice making superior-subordinate communication possible within the organization is important to develop an organizational decision making and a good error detection system. The presence of employee voice seems positive for organizations while the lack of it might be harmful to organizations and employees.

For educational organizations, voice predicts the autonomy of teachers and students as it is a form of communication that reflects a democratic culture in the organizational structure. In this respect; knowledge, opinions, suggestions, criticisms and observations of teachers as employees of educational organizations are valuable resources for democratic organizational culture. Furthermore, sharing existing information is as important as a source of information within an organization; however, it is often difficult to share information in organizations (Yeniceri & Demirel,

2007). Since knowledge-sharing is significant for both improving the organization and resolving existing problems, the lack of knowledge-sharing and communication problems may threaten educational organizations and teachers as employees from many aspects. When teachers are not able to voice work-related opinions or information to the management, managers might be too late to solve the organizational problems, teachers might become demotivated and dissatisfied; thus, the educational quality and performance of schools might diminish. Since employee voice prevents these adverse situations, it is an organizationally desired behavior. Employees also have their own individual aims. For organizational performance, harmony between individual and organizational aims is important. According to the study conducted by Dundar and Tabancali (2012), teachers with experience of 1-5 years cannot adapt to their workplace. It is very common that teachers lose their teaching motivations in a few years, which has a negative impact on the success of the schools. The solution to deal with these problems may be a successful communication with the school administrations by making them aware of ideas, opinions, suggestions and desires of the teachers. Therefore, voice can be very effective to tackle these problems; thus, to find out to what extent the teachers' voice, and which factors are related to teacher's voices are vital issues for school administrations.

As it is seen, voice is vital for the sustainability and success of schools, so factors related to voice become an important field for researchers. Employees' beliefs about the efficacy of their voicing and concerns about risk due to voicing are critical to whether they voice (Morrison, 2011). Employees search for some contextual cues to decide on how proper to the voice in that organization (Dutton, Ashford, Lawrence & Miner-Rubino, 2002). For the development and sustainability of organizations, factors affecting voice are important. In the related literature, there are some studies that examine mechanisms enhancing or alleviating voice (Ashford & LeCroy, 2009; Detert & Burris, 2007; Dutton, Ashford, Lawrence & Miner-Rubino, 2002; LePine & Van Dyne, 2001; Milliken, Morrison & Hewlin, 2003; Morrison & Milliken, 2000; Morrison, 2011; Near & Miceli, 2008; Stamper & Van Dyne, 2001; Tangirala & Ramanujam, 2008). Still, employee voice concept seems ignored compared to other related concepts such as employee participation since it does not symbolize the exact outcomes such as influence or power-sharing (Wilkinson, Gollan, Kalfa & Xu, 2018). According to voice literature, the preliminary motive for voice is assumed to improve the performance of organizations or to provide collective benefits (Ashford & LeCroy, 2009). According to Morrison (2011), the factors related to voice are categorized as individual and contextual factors. Individual factors are summarized as the personality of employees, and attitude towards their duties; and contextual factors are summarized as organizational structure, organizational culture, and collective beliefs. While there are some studies examining factors related to voice, there are few studies examining teacher voice in school settings. However, it is a must to examine the teacher's voice, and related factors to voice to understand the nature of voice at schools to be able to develop the success of schools so that education improves. The aim of this study is to contribute to existing literature, to attract attention to teacher voice concept, and to fill the research gap by providing a better understanding of teacher voice concept. Therefore, the present study aims to find out the level of teachers' perceptions of voice

and whether there is a significant relationship between teacher voice, and personality and psychological safety. The research questions of the study are as follows:

1. What is the level of teacher voice?
2. Is there a correlation between psychological safety and teacher voice?
3. Is there a correlation between five factor personality traits and teacher voice?
4. Is there a correlation between psychological safety and five factor personality traits?

Method

Research Design

The study is a quantitative study based on the relational survey model. It examines the relationship between two or more different variables (Creswell, 2014). The variables examined in the study are employee voice, psychological safety and personality.

Research Sample

The study was carried out on the European side of Istanbul in the Fall and Spring semesters of the 2017-2018 academic year. The statistics of the National Ministry of Education shows that there are 22.272 teachers working in public primary schools (Istanbul Provincial Directorate of National Education, 2017). It is assumed that 377 teachers with a 95% confidence level represent the population stated above (Cingi, 2009). For this reason, 475 teachers were selected through simple random sampling from teachers in public primary schools in 25 districts on the European Side of İstanbul. Before the study was applied, the teachers were informed about the purposes of the study, and only volunteer teachers took part in the study.

77.1% of the participants were female while the rest 22.9% were male. As for their education level, 88.2% of the participants held a bachelor's degree, 11.4% master's degree, and 0.4% doctorate degree. Concerning their years of teaching, 28.2% of the participants had a working experience of 1-5 years, 22.1% 6-10 years, 20% 11-15 years, 12.6% 16-20 years, and 16.2% 21 years or more than 21 years. In terms of their years of working at the current school, 23,6% worked for less than 1 year, 52,8% for 1-5 years, 15,4% for 6-10 years, and 8,2% for 10 years or more than 10 years at the current school.

Research Instruments and Procedures

The quantitative data gathered through three different instruments, which were Employee Voice Scale, Quick Big Five Personality Test and Psychological Safety Scale. Employee voice was measured using The Employee Voice Scale developed by Van Dyne and LePine (1998). The scale was adapted to the Turkish language by Cetin and Cakmakci (2012). The scale consisted of six items, and the participants responded to a five-point Likert scale ranging from 1 "never" to 5 "always".

Exploratory and Confirmatory Factor Analysis was used to test the structural validity of the scale (Cetin & Cakmakci, 2012). To determine the construct validity of the scale, exploratory and confirmatory factor analyses were employed, and the analyses revealed only one factor. The factor loadings of the items were found above 0.70. The variance explained was 62%. The reliability coefficient was calculated as 0.874, and item-total correlations were above 0.56. These values show that the scale is acceptable, and the scale will provide valid and reliable results (Cetin & Cakmakci, 2012). When the reliability coefficients of the six-item Employee Voices Scale were examined, Cronbach's Alpha value of the general scale perceptions was calculated as 0.883. In the social sciences, it represents valuable, moderate security between 0.60 and 0.80 (Kalayci, 2009). Accordingly, the calculated reliability value indicates that the scale is reliable.

Five-Factor Personality Model is a quantitative way to assess personality traits, and the model is seen as a highly accepted way to assess personality by the researchers. It is conceptualized as five personality traits which are extraversion, agreeableness, emotional stability, conscientiousness and openness to experience and those five personality traits represent personality at the highest extent in organizations (Goldberg, 1993). By using five-factor personality traits, The Quick Big Five Personality Test was developed by Vermulst and Gerris (2005; as cited in Morsunbul, 2014). The scale was adapted to the Turkish language by Morsunbul (2014). It consists of 30 items with five dimensions which are extraversion, agreeableness, emotional stability, conscientiousness and openness to experience. The participants responded to a seven-point Likert scale ranging from 1 "Very untrue of me" to 7 "Very true of me".

Confirmatory Factor Analysis was used to test the structural validity of the scale (Morsunbul, 2014). $\chi 2$ /sd ratio was calculated as 3.76 with DFA and the proposed model is compatible with the data according to these values. The Goodness of fit index was 0.91 and the comparative fit index value was 0.92; the Normed Fit Index was 0.91; the Not-Normed Fit Index was calculated as 0.91 and the Root Mean Square Error of Approximation was 0.08. These values show that the five dimensions of the scale which are agreeableness, extraversion, conscientiousness, emotional stability and openness to experience are acceptable and the scale will provide valid and reliable results (Morsunbul, 2014). Cronbach's Alpha value for each dimension was measured. 0.60-0.80 values show considerable reliability, and values which are 0.80 and above show high reliability in social sciences (Kalayci, 2009). Cronbach's Alpha value of Extraversion was 0,825, Cronbach's Alpha value of agreeableness was 0,740, Cronbach's Alpha value of emotional stability was 0,792, Cronbach's Alpha value of conscientiousness was 0,792 and Cronbach's Alpha value of openness to experience was 0,759. These values show that the test is reliable.

Psychological safety was measured using Psychological Safety Scale developed by Edmondson (1999; as cited in Yener, 2015). The scale was adapted to the Turkish language by Yener (2015). It consists of 7 items with two dimensions which are toleration and initiative. The participants responded to a seven-point Likert scale ranging from 1 "Strongly disagree" to 5 "Strongly agree".

Confirmatory Factor Analysis was used to test the factor structure of the scale (Yener, 2015). $\chi 2$ /sd ratio was calculated as 2.80 with DFA and the proposed model was compatible with the data according to these values. The Goodness of fit index was 0.95 and the comparative fit index value was 0.95; the Normed Fit Index was 0.92 and the Root Mean Square Error of Approximation was 0.10 (Yener, 2015). These values show that the scale is acceptable, and the scale provides valid and reliable results. Cronbach's Alpha value for each dimension was measured; Cronbach's Alpha value of toleration was 0,607 and Cronbach's Alpha value of initiative was 0,684. Generally, Cronbach's Alpha value of studies was supposed to be above 0.70. However, according to Kalayci (2009), in social sciences, 0.40-0.60 values show low reliability, 0.60-0.80 values show considerable reliability, and values which are 0.80 and above show high reliability. These values show that the scale is reliable.

Data Analysis

The data were analyzed with SPSS 21 packet program. Since the population of the study was more than 30, Kolmogorov-Smirnov normality analysis was applied to determine whether the distribution of the data displayed normality. Pearson correlation analysis was used to analyze the relationship and the degree of relationship. Cronbach Alpha value test was used to evaluate the reliability of the scale (Kalayci, 2009).

Table 1

Normal Distribution Test Results

Scale	Statistic	df	p	Skewness	Kurtosis	Mean	Median
Psychological Safety	0,077	475	0,00	-0,480	0,346	3,40	3,42
Quick Big Five Personality Test	0,034	475	0,20	-0,022	-0,397	5,27	5,30
Employee Voice	0,105	475	0,00	-0,712	0,271	3,96	4,00

According to the results of Kolmogorov-Smirnov normality analysis, it was decided that the distribution of the data did not deteriorate from the normality although the data did not display normal distribution ($p < 0.05$), since the kurtosis and skewness were between ± 2.0 (George & Mallery, 2010), the mean and the media were close to each other, and the number of participants was above 30 due to the central limit theorem. As a result, it was decided to use parametric analyses.

It is stated that if the p-value is less than 0.05, it is interpreted that results are statistically significant. If the p-value is greater than 0.05, results are interpreted as statistically insignificant. If r value is between 0.70 and 1.00, it presents a high level of relationship. If the r-value is between 0.70 and 0.30, it presents a moderate relationship. If it is between 0.30 and 0.00, it presents a low relationship (Buyukozturk, Kilic Cakmak, Akgun, Karadeniz & Demirel, 2012).

Results

This part includes the analysis of the level of teacher voice and correlations between the variables. To find out the level of teacher's voice, mean and standard deviation values for each item are analyzed, described and explained in Table 2.

Table 2

The Level of Teacher Voice

Items		Never	Rarely	Sometimes	Often	Always	$\bar{x}$	s.s
1. I make suggestions about issues concerning the institution I work for.	n	13	54	131	136	141	3,71	1,09
	%	2,74	11,37	27,58	28,68	29,68		
5. I try to contribute to issues that may affect the quality of the work environment.	n	4	21	52	208	190	4,18	0,85
	%	0,84	4,42	10,95	43,79	40,00		
							Mean = 3,97	

The level of the teacher's voice was at level "Often" ($\bar{x}$=3.97). The item with the highest mean the participants perceived was "I try to contribute to the issues that may affect the quality of my work environment." ($\bar{x}$= 4.18) while the item with the lowest mean was "I make suggestions about issues concerning the institution I work for." ($\bar{x}$= 3.71).

To find out the level of teachers' psychological safety perception, mean values for each dimension are analyzed, described and explained in Table 3.

Table 3

Mean Values for two Dimensions of Psychological Safety

Dimensions	$\bar{x}$
Toleration	3,48
Initiative	3,34
	Mean = 3,41

When the level of teachers' psychological safety perception was examined; it was determined that the level of perception on the dimension of toleration was at the level of "Agree" ($\bar{x}$=3.48). Teachers' level of perception on the dimension of the initiative was found to be "Neither agree nor disagree" ($\bar{x}$= 3.34). It was determined that their perception of psychological safety was at the level of "Agree" ($\bar{x}$= 3.41).

Table 4 shows the relationship between psychological safety, the dimensions of psychological safety and teacher voice.

Table 4

Correlation between Psychological Safety and Teacher Voice

	Teacher Voice	Toleration	Initiative	Psychological Safety
Teacher Voice	1	,180**	,275**	,261**
		,000	,000	,000
Toleration		1	,584**	,863**
			,000	,000
Initiative			1	,914**
				,000
Psychological Safety				1

It was observed that there was a positive and low correlation between psychological safety and teacher voice ($p<0.01$, p= 0,000, r=0,261). As for its dimensions, similarly, it was observed that there was positive correlations between toleration and teacher voice ($p<0.01$, p= 0,000, r=0,180), and between initiative and teacher voice ($p<0.01$, p= 0,000, r=0,275) while the strength of the relationships was low.

Table 5 shows the mean values for each dimension to find out the level of teachers' five-factor personality traits perception.

Table 5

Mean Values for five Dimensions of Personality

Dimensions	$\bar{x}$
Agreeableness	6,05
Extraversion	4,75
Conscientiousness	5,35
Emotional stability	4,70
Openness to experience	5,50

When the levels of teachers' personality perception were examined; it was determined that the level of perception on the dimension of agreeableness was "Very true of me" ($\bar{x}$=6.05). Teachers' level of perception on the dimension of extraversion was found to be "Somewhat true of me" ($\bar{x}$=4.75). It was determined that their perception to the dimension of responsibility was "Very true of me" ($\bar{x}$=5.35). It was

determined that their perception of the dimension of emotional balance was at the level of "Somewhat true of me" ($\bar{x}$=4.70). Their perception of the dimension of openness to experience was found to be "True of me" ($\bar{x}$=5.50).

As can be seen in Table 6, significant correlations were found between some personality traits and the teacher's voice.

Table 6

Correlations between Five-Factor Personality Traits and Teacher Voice

	Teacher voice	Agreeableness	Extraversion	Conscientiousness	Emotional stability	Openness to experience	Personality
Teacher voice	1	,309**	,295**	,089	,172**	,338**	,358**
		,000	,000	,050	,000	,000	,000
Agreeableness		1	,235**	,277**	,233**	,487**	,622**
			,000	,000	,000	,000	,000
Extraversion			1	,028	,477**	,493**	,677**
				,548	,000	,000	,000
Conscientiousness				1	,152**	,136**	,546**
					,001	,003	,000
Emotional stability					1	,250**	,690**
						,000	,000
Openness to experience						1	,681**
							,000
Personality							1

There were positive correlations between agreeableness and teacher voice (p<0.01, p= 0,000, r=0,309), between extraversion and teacher voice (p<0.01, p= 0,000, r=0,295), between emotional stability and teacher voice (p<0.01, p= 0,000, r=0,172), and lastly, between openness to experience and teacher voice (p<0.01, p= 0,000, r=0,338). The strength of all the correlations was low.

Significant correlations were found between psychological safety and some personality traits in Table 7.

Table 7

Correlation between Psychological Safety and Five-Factor Personality Traits

	Toleration	Initiative	Psychological safety	Agreeableness	Extraversion	Conscientiousness	Emotional stability	Openness to experience	Personality
Toleration	1	,584**	,863**	,075	,063	-,010	,167**	-,012	,092*
		,000	,000	,104	,170	,822	,000	,795	,045
Initiative			,914**	,149**	,065	,009	,201**	,058	,144**
			,000	,001	,159	,840	,000	,207	,002
Psychological safety			1	,130**	,072	,000	,208**	,030	,135**
				,004	,118	,993	,000	,515	,003
Agreeableness				1	,235**	,277**	,233**	,487**	,622**
					,000	,000	,000	,000	,000
Extraversion					1	,028	,477**	,493**	,677**
						,548	,000	,000	,000
Conscientiousness						1	,152**	,136**	,546**
							,001	,003	,000
Emotional stability							1	,250**	,690**
								,000	,000
Openness to experience								1	,681**
									,000
Personality									1

Agreeableness was positively correlated with psychological safety ($p<0.01$, $p= 0,000$, $r=0,130$). Emotional stability was positively correlated with psychological safety ($p<0.01$, $p= 0,000$, $r=0,208$). The strength of both correlations was low. It was found that there was no significant relationship between psychological safety and extraversion, conscientiousness and openness to experience.

When it comes to the dimensions of psychological safety, similar correlations were found. There were positive correlations between initiative and agreeableness ($p<0.01$, $p= 0,000$, $r=0,149$), and between initiative and emotional stability ($p<0.01$, $p= 0,000$, $r=0,201$) while the strength of the relationships was low. It was found that there was no significant relationship between toleration and five-factor personality traits.

Discussion, Conclusion and Recommendations

The study was conducted to determine the level of the teacher's voice. It also examined the relationships between voice, five-factor personality traits and psychological safety. This section includes a discussion of the findings.

The first aim of this study was to determine the level of employee voice of teachers. The level of the voice of teachers was found as "Often", which is consistent with related research (Cetin, 2013, Bulut & Bayramlik, 2015; Sagnak, 2017). Since teachers are the most important source to express possible problems to school management (Smylie, 1992), teacher participation can be a way to create a culture of innovation and a prerequisite for improvement of school (Detert & Edmondson, 2006), and institutions encouraging, and rewarding employee voice is close to achieving their organizational aims (Honingh & Hooge, 2014); thus, teachers' high perceptions towards voice seem a positive development for schools. Furthermore, according to Ashford and LeCroy, (2009), the main motive for employee voice is the desire to develop organizational performance and collective benefit. Based on the finding that teachers often voice their ideas, opinions and suggestions, teachers in Turkey seem willing to develop the performance of schools they work.

The second aim was to examine the relationship between psychological safety and voice. The results showed that there was a significant and positive relationship between two variables, which seems consistent with the related literature. Kahn (1990) states psychological safety diminishes the perception of risk of employees because of voicing, and, similarly, Eggers (2011) states that psychological safety climate encourages employees to say their opinions or ideas to the top management by taking a calculated risk so that organizational learning and changing stage start. The literature on employee voice shows that concerns about the risk on negative effects of their voice have a significant effect on their decision to voice (Morrison, 2011). Expectancy Theory assumes that individuals decide how to act by making predictions on the future and evaluating the social systems they are in (Vroom, 1964 as cited in Hoy & Miskel, 2015). A high level of psychological safety might make the evaluation of social systems more positive, and it might raise the possibility of the employee to voice. Thus, schools with a high level of psychological safety encourage teachers to voice, which affects schools positively.

Relationships among colleagues matter when it comes to a psychologically safe climate. Kahn (1990) found that psychological safety enhances when interpersonal relationships are supportive and reassuring, and Hoy and Miskel (2015) state that the climate of schools is mainly about collective beliefs of teachers, and perception of social

support helping to speak up their opinions freely is effective to deal with problems involving schools. Teachers with a higher level of psychological safety might feel that their relationships with their colleagues are more positive, and they have social support. Thus, their risk perception as a result of voicing might decrease, and they might have a more positive attitude towards speaking up. However, they avoid expressing themselves in their workplace when they do not feel free and safe (Cheng, Chang, Kuo & Lu, 2014). For example, according to the study conducted Prouska and Psychogios (2018), an economic crisis as in Greece which threatens job safety might avoid voicing since they are afraid of futility or danger of voicing, and the researchers found out economic context matters for voicing when it is thought negative psychological and economic effects resulted from negative economic context such as a long-term crisis. As for Turkey, teachers have a public employee status (Buyukgoze, 2015). Therefore, they might not worry about the negative results of voicing since they already have job security.

The third aim was to examine the relationship between five-factor personality traits and voice. Results show that there is a significant and positive relationship between extraversion, agreeableness, emotional stability and openness to experience, and voice, which is compatible with Cetin (2013) examining the teacher's voice. Also, Morrison (2014) and LePine and Van Dyne (2001) suggest that extraversion is a motivating personality trait for voicing, and Nikolau, Vakola and Bourantas (2008) find out that emotional stability is one of the important predictors of voice. Extraverted individuals are more comfortable while communicating with others (LePine & Van Dyne, 2001). Therefore, they might not be afraid of risks as a result of their attempt to challenge the status quo, and they might be willing to voice. Moreover, according to Constructive Communication Theory (CCT), voicing itself is not enough for creating an effect; high communication skills also matter for the efficiency of voice (Ozyilmaz & Taner, 2018). Extraverted people are more prone to have better communication skills (LePine & Van Dyne, 2001). That is why; they might be more inclined to speak up by believing the efficiency of their voicing. Agreeable people are expected to be inclined to maintain the status quo, and to obey the group norms; and thus, they may not be inclined to voice (Van Dyne & LePine, 1998), which conflicts with the result of this study. According to Cetin (2013), the Turkish primary school context does not make teachers think their voicing might be harmful to their interpersonal relationships with their colleagues so that they will not avoid challenging the status quo by voicing. The difference in context might explain the relationship between variables.

Individuals low in emotional stability are inclined to feel nervous while they are speaking or stating their opinions about changing while ones high in emotional stability have high-level perceptions of self-trust and efficiency, so they will not be anxious to create a change in their organization (LePine & Van Dyne, 2001). That reasonability could explain the positive relationship between voice and emotional stability. People with openness to experience are inclined to be flexible and creative, and they are ready to change and adapt to different circumstances easily and look at the issues from a different perspective. Therefore, they are willing to voice since they

could come up with solutions to problems of schools, and they could help schools to adapt to changing circumstances.

The fourth aim of the study was to examine the relationship between psychological safety and five-factor personality traits. Emotional stability was found to be positively related to psychological safety, which is consistent with the study of Edmondson and Mogelof (2005). They found out that there is a negative relationship between emotional instability and psychological safety; some employees may be prone to suspect their colleagues and see their workplace hostile since employees with a high level of emotional instability tend to feel negative emotions such as anxiety, inferiority and shame for a longer time. In addition, the results showed that there was a significant and positive relationship between agreeableness and psychological safety. According to McShane and Von Glinow (2011), employees with a high level of agreeableness are more successful at dealing with their problems. Thus, they become more adept at solving the problem when they face with a condition that threatens their psychological safety. In their study, Edmondson and Mogelof (2005) found out that extraversion and openness to experience are correlated with psychological safety while the results of this study do not show a significant relationship between them. These different results might be derived from the contextual differences.

The study showed that teachers working at Turkish public primary schools are often eager to voice their ideas, opinions, and suggestions to the management. Thus, this result seems very positive when thought positive effects of voice such as promoting organizational learning, change and innovation on individuals and organizations. The study proves the importance of individual traits for psychological safety and voice by finding out correlations between some personality traits, psychological safety and teacher's voice. Furthermore, the study shows the significance of context for employee voice. Teachers tend to speak up when the climate of a school is perceived as psychologically safe. Thus, as a practical implication, it is significant that school administrations create a supportive climate for teachers and develop upward communication channels to improve the employee voice at schools. The study supports employee voice literature stating that employees track some contextual clues to voice in the organizations. However, the strength of the correlation between employee voice, and personality and psychological safety is low, which implies that employee voice includes complicated processes, and there are other individuals and organizational factors related to voice.

Lastly, the legal status of teachers seems relevant to the teacher's voice since it determines job security. When a civil servant status of public-school teachers in Turkey is thought, the results might be explicated within Turkish public schools - context. As a theoretical contribution, the study contributes to existing literature and fills the research gap by providing a better understanding of the teacher voice concept.

School administrators might develop upward communication channels to create a psychologically safe climate at school settings so that teacher voice can be encouraged based on the positive relationship between psychological safety and teacher voice found by the study. The same subject might be re-examined at private schools to make

an extensive evaluation of teacher's voices, and results might be compared based on significant relationships between teacher voice, and personality and psychological safety at public schools. Furthermore, the teacher's voice of UN countries might be examined to boost the generalizability of the study when it is thought teachers' different status compared to Turkey. Based on the result of the study that the relationships between the variables are low, which shows there are other factors related to employee voice concept, future studies might focus on other related factors to understand motives behind voicing better. Also, qualitative and quantitative studies examining individual and organizational factors might be carried out to enlighten the psychological mechanisms of voice.

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Öğretmenlerin Kişilik Özellikleri, Psikolojik Güvenlik Algıları ile Öğretmen Sesliliği Arasındaki İlişkiler

Atıf:

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Özet

Problem Durumu: Klasik yönetim anlayışının değişim geçirmesiyle, örgütlerde etkileşim, başarma kültürü ve etkileşim önem kazanmıştır. Bununla beraber, örgütlerde karar verme kültürü de evrimleşmeye başlamış ve karar verme sadece yöneticilerin sorumluluğu değil, kurumsal yapıdaki çalışanların sorumluluğu olmaya başlamıştır. Bu nedenle, çalışanların yönetime fikir, düşünce ve önerilerini önermesi anlamına gelen çalışan sesliliği, örgütler açından önemli bir davranış olarak öne çıkmıştır.

Çalışan sesliliği, çalışanların çalıştıkları kurumla ilgili fikir ve görüşlerini yönetime ifade edip örgütsel karar verme süreçlerine katılımlarını ifade etmektedir. Çalışan sesliliği kavramı kurumu geliştirme, kurumsal problem çözme, kurumdaki uygulamaları veya haksızlıkları yönetime iletme gibi boyutlardan oluşmaktadır. Alan yazın incelendiğinde, çalışan sesliliğinin hem bireyin hem örgütün performansını geliştirdiği hem de çalışanlar tarafından gönüllü gerçekleştirilen bir davranış olduğu için örgütsel öğrenmeye katkıda bulunduğu görülmektedir. Benzer olarak, çalışan sesliliğinin düşük olduğu kurumlarda, örgütsel performansın düştüğü ve bireyin psikolojik veya fiziksel sağlığının kötü etkilendiği gözlemlenmektedir.

Görüldüğü gibi, çalışan sesliliği örgütlerin devamlılığı ve başarısı için önemlidir. Bu nedenle, çalışan sesliliği ile ilgili faktörler araştırmacılar için önemli bir çalışma alanı olmuştur. Diğer yandan, bir örgütte çalışan sesliliği davranışının var olması, demokratik kurum kültürünün bir göstergesi olabilir. Eğitim kurumlarında sesliliğin var olması, öğretmenin ve öğrencinin özerk olması ile ilgilidir; ancak bu şekilde eğitim kurumlarının demokratikliğinden bahsedilebilir. Çalışan sesliliği düzeyinin az olduğu okullarda, öğretmenlerin motivasyonu olumsuz etkilenebilir ve kurumdaki problemler zamanında çözülemeyebilir, bu nedenle eğitim ve öğretim kalitesi olumsuz etkilenebilir. Bu nedenle, çalışan sesliliği, eğitim kurumlarında var olması istenilen, önemli bir davranıştır.

Alan yazında seslilik ile ilgili araştırmalar olsa da çok azı okullarda yapılmıştır. Ancak, öğretmen sesliliği ve ilgili faktörleri incelemek, okullardaki seslilik olgusunun anlaşılması ve eğitim-öğretim süreçlerinin geliştirilip eğitimde başarının artması için önemlidir. Bu araştırmanın amacı, öğretmen sesliliği kavramının önemine dikkat çekmek ve öğretmen sesliliğinin daha iyi anlaşılmasının sağlayıp alan yazına katkıda bulunmaktır. Bu yüzden, araştırma öğretmen sesliliği düzeyini ve öğretmenlerin

kişiliği ve psikolojik güvenlik algıları ile öğretmen sesliliği arasındaki ilişkileri incelemektedir.

Araştırmanın Amacı: Araştırmanın amacı, İstanbul Avrupa Yakasındaki resmi ilkokullardaki öğretmen sesliliği algı düzeylerini tespit etmek ve psikolojik güvenlik ve beş faktör kişilik özellikleri ile öğretmen sesliliği arasındaki ilişkileri incelemektir.

Araştırmanın Yöntemi: Araştırma ilişkisel tarama modeline dayalı nicel bir araştırmadır. Araştırmanın örneklemini, 2017-2018 Eğitim ve Öğretim yılında İstanbul Avrupa Yakasında resmi ilkokullarda çalışan 475 öğretmen oluşturmaktadır. Araştırmada Çalışan Sesliliği, Hızlı Beş Büyük Kişilik Testi ve Psikolojik Güvenlik olmak üzere üç ölçek kullanılmıştır. İstatistiksel analiz için SPSS 21 kullanılmıştır.

Araştırmanın Bulguları: Araştırma bulgularına göre, ilkokuldaki öğretmen sesliliği algı düzeyi ortalamanın üstünde ve "Genellikle" seviyesindedir. Uyumluluk, dışadönüklük, duygusal denge ve deneyime açıklık kişilik özellikleri ile öğretmen sesliliği arasında anlamlı ve pozitif bir ilişki bulunmuştur. Psikolojik güvenlik ile duygusal denge ve uyumluluk arasında anlamlı ve pozitif bir ilişki bulunmuştur. Son olarak, psikolojik güvenlik ile öğretmen sesliliği arasında anlamlı ve pozitif bir ilişki bulunmuştur.

Araştırmanın Sonuçları ve Önerileri: Araştırma sonucuna göre, ilkokulda öğretmen sesliği algısı "Genellikle" seviyesindedir ve ortalamanın üstündedir. Bu sonuç, Türkiye'deki resmi ilkokullarda çalışan öğretmenlerin fikirlerini, düşüncelerini ve önerilerini idareye sunmaları için istekli olduklarını göstermesi açısından dikkat çekicidir. Çalışan sesliliğinin örgütsel öğrenme, değişimi ve inovasyon ortamlarını geliştirmesi gibi pozitif etkilileri düşünüldüğünde, öğretmen sesliliğinin yüksek olması olumlu bir sonuç olarak görülebilir. Diğer bir bulguya göre, öğretmenler okullarının iklimlerini psikolojik olarak güvenli algıladıklarında, konuşmaya meyilli olurlar. Öğretmenlerin psikolojik güvenlik algıları, kişilik özellikleri ile de ilgilidir, araştırmaya göre, uyumlu ve duygusal olarak dengeli öğretmenler, içlerinde bulunduğu ortamı psikolojik olarak güvenli olarak algılamaya daha çok meyillidir. Ayrıca uyumlu, dışadönük, deneyime açık ve duygusal olarak dengeli olan öğretmenler fikirlerini, düşüncelerini ve önerilerini daha çok seslendirmektedir. Araştırma sonucu bulunan bütün ilişkiler anlamlı ve pozitif olmakla beraber, ayrıca bütün ilişkilerinin düşük seviyede olduğu görülmüştür. Sonuçların da kanıtladığı üzere, kişilik ve psikolojik güvenliğe ek olarak, çalışan sesliliği başka bireysel ve örgütsel faktörleri de ilgili olan karmaşık süreçleri içerek bir davranıştır. Ayrıca, çalışanların örgütlerinde ses vermek için bağlamsal ipuçları takip ettiği ve bazı kişilik özelliklerinin çalışanları ses vermeleri için cesaretlendirdiği veya onların cesaretlerini kırdığını ifade eden ve çalışan sesliliği alan yazınında yer alan çalışmalar, mevcut araştırma tarafından desteklenmiştir. Bu nedenle araştırma sonuçları, öğretmen sesliliğine ışık tutması açısından değerlidir.

Çalışan sesliliği birey ve örgütler açısından karmaşık süreçleri içeren önemli bir örgütsel davranıştır. Bu nedenle, mevcut araştırmanın değişkenleri olan öğretmen sesliliği, psikolojik güvenlik ve kişilik arasındaki ilişki, farklı kademelerdeki özel veya devlet okullarında çalışan öğretmenler üzerinde tekrar araştırılabilir. Ayrıca, seslilik

davranışının arkasında olan psikolojik mekanizmaları daha iyi anlamak için, ses verme ile ilgili olabilecek bireysel veya örgütsel faktörler karma araştırmalarda incelenebilir, hatta gelecek araştırmalar öğretmenlerin seslilik davranışlarının yordayıcılarını araştırarak okul yöneticilerine rehberlik edilmesini sağlayabilir.

Anahtar Kelimeler: Dikey iletişim, eğitim örgütü, çalışan donanımı, insan kaynakları yönetimi

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The Role of Self-Efficacy in Job Satisfaction, Organizational Commitment, Motivation and Job Involvement*

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ABSTRACT

Purpose: Self-efficacy belief procures teachers to root for each other's development in some issues such as ameliorating new methods to conduct much more effective teaching. A school with a high level of self-efficacy teachers makes a great contribution in order to corroborate self-efficacy perceptions of students. When examining it on a model with many attitudinal variables, self-efficacy belief, an important concept in terms of education quality, has been deemed significant so as to propound the effects of self-efficacy more clearly. This study aimed to determine the relationship between self-efficacy and job satisfaction, organizational commitment, motivation and job involvement.

Research Method: 321 teachers from 33 schools that were selected randomly with the cluster sampling method from the middle schools in the province of Hatay city center in the 2017-2018 academic year have composed the sampling of this study.

Findings: The more teachers' self-efficacy beliefs increased, the more their job satisfaction, organizational commitment, motivation and job involvement increased. Both job satisfaction and organizational commitment partially mediated the relationship between teachers' sense of self-efficacy and motivation. Self-efficacy beliefs positively affected teachers' job involvement through the full mediation effect of job satisfaction and motivation. Organizational commitment and motivation fully mediated the relationship between teachers' self-efficacy and job involvement.

Implications for Research and Practice: It is crucial for school administrators to contribute to amend and strengthen self-efficacy perceptions of teachers if they hope teachers to take positive attitudes towards their work much more frequently and to take the edge off negative attitudes.

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Introduction

In developing countries, teachers are the most important members of the education system. These countries want to recruit teachers with high quality. Teachers' efficacy is crucial for having a successful education system. In relation to getting teachers with high self-efficacy, some work-related attitudes become prominent such as job satisfaction, organizational commitment, motivation and job involvement. The concept of self-efficacy enables teachers to develop positive attitudes to their work environment. Teachers with high self-efficacy believe that since they have a great degree of professional capabilities in teaching and managing challenging tasks, they could attain their full potential. It has been remarked that these obtained beliefs positively mirror on all the students. So, students feel powerful and become more successful at managing challenging problems, learning subjects and even learning to learn in their schools.

Former studies have shown that so as to promote positive attitudes and effective strategies to cope with negative attitudes, self-efficacy is a magnificent organizational facilitator (Betoret & Artiga, 2010). Teachers' senses of self-efficacy influence their attitude and behavior in the classroom. Self-efficacy beliefs redound on the energy they expend whilst teaching, the goals they set, and their perceptions of self-confidence (Demir, 2018a; Tschannen-Moran & Woolfolk Hoy, 2001).

There appear to be no available studies in which all these performance variables are examined together in the literature. Commonly, there are individual studies examining the links between self-efficacy and various positive and negative attitudes. This study provides to enlighten how teachers' self-efficacy level is associated with job satisfaction, organizational commitment, motivation and job involvement. These indicators are crucial for obtaining performance. it has been anticipated theoretically and practically to present better perspectives for the current status of teachers in educational organizations. This study could also generate links between alternative theoretical models.

Theoretical Foundations

Self-Efficacy

Self-efficacy is defined as individuals' beliefs that they are capable of reaching the goals and performing the specific tasks (Bandura, 2002; Hefferon & Boniwell, 2011; Luszczynska, Scholz, & Schwarzer, 2005; Robbins, Decenzo, & Coulter, 2013; Schermerhorn et al., 2011). Self-efficacy is expressed as 'the power of I can' (Hefferon & Boniwell, 2011: 104). Research has indicated that individuals who have a high level of self-efficacy attach on their competences about competing with the challenges and obstacles more than individuals with a less level of self-efficacy. A low level of self-efficacy causes individuals to decrease or dissolve their efforts to cope with the challenges and obstacles (Cetin & Basim, 2014; Robbins et al., 2013).

The understanding of an employee's capacity and competence impact his/her perceptions, motivation and performance (Tschannen-Moran & Woolfolk Hoy, 2001; Tschannen-Moran, Woolfolk Hoy, & Hoy, 1998; Woolfolk & Hoy, 1990). If employees despair of succeeding in a task, they won't endeavor to perform (Lunenburg & Ornstein, 2012). Self-efficacy beliefs affect the preferences we decide on, the effort we make, our level of motivation, how we feel about ourselves or others, the duty and how long we insist on when we are exposed to obstacles (Hefferon & Boniwell, 2011). Self-efficacy can aid teachers to live up to their full potential in teaching.

Job Satisfaction

Job satisfaction has been one of the most common and most investigated concepts because of its connections with the other important phenomena relevant to work (Ozkalp & Kirel, 2010). Job satisfaction is described as the degree to which an individual has positive and negative feelings about a job, other workers and work environment (Schermerhorn et al., 2011). Job satisfaction is prevalently known as an internal reaction against the work conditions (Gkolia, Belias, & Koustelios, 2014). The internal reaction is emotional and attitudinal response (Schermerhorn et al., 2011).

Many studies have unveiled the connections between job satisfaction and other variables in organizations (Schermerhorn et al., 2011). A meta-analysis of nine studies involving 1739 workers found out a significant positive relationship between job satisfaction and motivation. This meta-analysis study also showed satisfaction with the manager was positively correlated with motivation (Kinichi, McKee-Ryan, Schriesheim, & Carson, 2002). Another meta-analysis of 87 studies involving 27.925 has revealed that job satisfaction is positively related to job involvement (Brown, 1996). Based on these findings it has been considered that chuffed teachers are motivated to do their best for effective teaching to students, so this state provides teachers to devote themselves to their job.

Organizational Commitment

Organizational commitment is a more general concept with reference to job satisfaction (Kreitner & Kinichi, 2009). Job satisfaction is just involved in an individual's degree of satisfaction with the job, whereas organizational commitment is about an individual's commitment to both job and in business (Guney, 2012). Organizational commitment refers to what extent an employee is dedicated to his/her organization and its goals (Schermerhorn et al., 2011). The concept of organizational commitment has three facets as affective commitment, normative commitment and continuous commitment (Allen & Meyer, 1990; Meyer & Allen, 1991). Affective commitment includes positive feelings such as emotional attachment and identification with the employing organization. Continuance commitment stands for the degree of employing organization commitment which is concerned with the losses (labor, time and money) quitting the organization. Finally, normative commitment

means to persist with remaining in an organization because of the feeling of obligation (Allen & Meyer, 1990; Allen & Meyer, 1996; Meyer & Allen, 1991).

People strongly committed to employing organizations to identify with their organization and take pride in being a member of their organization (Schermerhorn et al., 2011). Committed workers have a desire for their work and feel a deep affection to their work, but uncommitted workers do not have a wish or energy for their work and don't care about this case (Robbins et al., 2013). Studies showed that a higher level of organizational commitment was associated with a higher level of positive job-related attitudes and behaviors (Kreitner & Kinichi, 2009). In the related literature organizational commitment has a positive correlation with job involvement and job performance and negative turnover (Kreitner & Kinichi, 2009; Schermerhorn et al., 2011). These findings are extremely important because managers can increase productivity and efficiency by investing and strengthening teachers' organizational commitment. In light of the findings, it's claimed that faithful teachers have a great desire and energy for teaching the students, feel a deep affection to their job and pull through with flying colors.

Motivation

Although administrators have a consensus that motivation is an important indicator of job performance in the organizations, they don't have a general agreement on the description of motivation. The concept of motivation is derived from "movere" (to move) in Latin words (Lunenburg & Ornstein, 2012). Motivation is generally a psychological process including energy, direction, and persistence of a person's effort that is goal-directed (Robbins et al., 2013). Many motivation theories have been developed to express the reason why people decide to take the plunge and processes which provide motivation. Most motivation theories agree that the least supplied need of people is the best motivator for them (Donmez, 2013).

Motivation has been one of the most conspicuous in administration because of its relations with job performance, productivity and efficacy (Donmez, 2013; Lunenburg & Ornstein, 2012). According to Han and Yin (2016) teacher motivation is a vital factor that has a relationship with several variables in education like student motivation, teaching practice and teachers' psychological satisfaction and well-being. They also indicate that motivation is essential for determining how to attract and retain teachers' energy and persistence in teaching activities. Although every teacher has a different personality and need, administrators should motivate them in the common vision in the direction of organizational aims.

Job Involvement

The concept of job involvement reflects to what extent an individual is actively involved with his/her job tasks (Schermerhorn et al., 2011). People with high job involvement are dedicated to and identify with their work roles (Kreitner & Kinichi,

2009; Robbins et al., 2013). Working beyond expectations to finish the given task is extremely important for people with high job involvement (Kreitner & Kinichi, 2009) because they consider performance is necessary for protecting their self-esteem (Robbins et al., 2013). Brown (1996) has found out in a meta-analysis study in connection with thousands of people that job involvement has a positive association with job satisfaction, organizational commitment and intrinsic motivation and negatively correlated to intentions to leave the organization. This finding implies that school administrators can enhance teachers' level of job involvement by providing positive work environments that support job satisfaction, organizational commitment and motivation.

The Relationships between Self-efficacy, Job Satisfaction, Organizational Commitment, Motivation and Job involvement

Self-efficacy is a self-confident perception of teachers that is considered as a crucial impact on student learning. The perceptions of self-efficacy often influence teachers' thinking models, behaviors, level of commitment, and job performance (Caprara, Barbaranelli, Steca, & Malone, 2006; Yang, Kao, & Huang, 2006). Self-efficacy is an organizational adjuvant to procure positive outcomes (Betoret & Artiga, 2010; Hefferon & Boniwell, 2011). Related studies have found a favorable tie between self-efficacy and affirmative attitudes such as job satisfaction (Caprara et al., 2006; Gkolia et al., 2014), organizational commitment (Busch, Fallan, & Pettersen, 1998; Mulvaney, 2014), motivation (Rosario, Blas, & Valle, 2009; Tschannen-Moran & Woolfolk Hoy, 2001; Tschannen-Moran et al., 1998; Woolfolk & Hoy, 1990) and job involvement (Yang et al., 2006). Studies showed the relationship between job satisfaction and motivation and job involvement (Brown, 1996; Kinichi et al., 2002; Kreitner & Kinichi, 2009; Ozkalp & Kirel, 2010; Schermerhorn et al., 2011). Many studies also revealed organizational commitment and motivation and job involvement were correlated with each other (Brown, 1996; Kreitner & Kinichi, 2009; Schermerhorn et al., 2011).

Purpose of the study

It's vital for schools to be effective by having teachers with a greater level of self-efficacy and consequently positive attitudes. Related literature brings into the gap that much more studies about the self-efficacy phenomenon are necessary in educational research. Moreover, no study could enucleate the relationship between self-efficacy and job satisfaction, organizational commitment, motivation and job involvement in only one study, and accordingly, it can be notified that this study presents a new model as per theoretical assumptions. This study has been implemented in order to determine the positive consequences of teachers' self-efficacy levels at school organizations. The hypothesized model of this research is given in Figure 1.

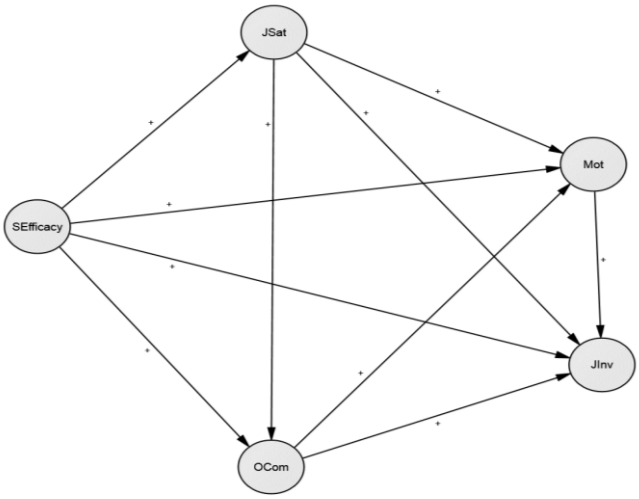

Figure 1. *The Hypothesized Model*

According to the hypothesized model in figure1, the hypothesis of this study was formulated as the following:

H1: Self-efficacy belief positively affects teachers' level of job satisfaction.

H2: Self-efficacy belief positively affects teachers' level of organizational commitment.

H3: Self-efficacy belief positively influences teachers' level of motivation.

H4: Self-efficacy belief has a positive impact on teachers' level of job involvement.

H5: Self-efficacy belief positively affects teachers' motivation through the mediating effect of job satisfaction.

H6: Self-efficacy belief positively affects teachers' motivation through the mediating effect of organizational commitment.

H7: Self-efficacy belief positively affects teachers' level of job involvement through the mediating effect of job satisfaction, organizational commitment and motivation.

Method

Research Design

This study has rejoiced in correlational design. Firstly, self-efficacy, job satisfaction, organizational commitment, motivation and job involvement levels of the teachers have been discovered through scales. Then, the relationships among these variables have been explored.

Research Sample

The population of the research was composed of teachers working at secondary schools at Hatay city center in Turkey in the 2017-2018 academic year. 33 secondary schools have been chosen randomly by the help of the cluster sampling method and the scales have been conducted to all the teachers at these schools. 321 teachers have agreed to take part as a sample of this study.

59.8% of the teachers were male (f = 192) and 40.2% were female (f = 129) who responded as participants of this study. 77.9% of the participants were married (f = 250), whereas 22.1% of them were single (f = 71). The most common age range of the participants has been 31-40 years old (f = 131), with a percentage of 40.8%. The majority of the participants (f = 163) had 1 to ten years of professional experience with a percentage of 50.8%.

Research Instruments and Procedures

Data of this study have been gathered by means of five-point Likert-type scales. The scales of Self-Efficacy, Job Satisfaction, Organizational Commitment, Motivation, and Job Involvement were applied to obtain the research data. On the data gathered in this study, exploratory and then confirmatory factor analyses were performed.

Validity and Reliability

Self-efficacy Scale has been improved by Schmitz and Schwarzer (2000) and adapted to Turkish by Yilmaz, Koseoglu, Gercek and Soran (2004). A two factor scale consisting of eight items presented a good fit to the data (explained variance = 57.107 %, Bartlett = 0.000, KMO = 0.806, χ^2 =46.538, df =18, χ^2/df =2.585, P-value = 0.000, RMSEA = 0.070, IFI = 0.958, TLI = 0.933, CFI = 0.957). Cronbach's Alpha has been 0.787 for the overall scale. Cronbach's Alpha coefficients of two dimensions were as follows; Coping business behavior: 0.725, Innovator business behavior: 0.772.

To measure job satisfaction, a global job satisfaction measure has been wielded. Job satisfaction has been developed by Griffin et al. (2010) and adapted by Karakus et al. (2019). A one-factor scale containing five items has acclimated with the data (explained variance =58.858%, Bartlett = 0.000, KMO = 0.804, χ^2 = 9.289, df = 5, χ^2/df = 1.858, P-value = 0.098, RMSEA = 0.052, IFI = 0.994, TLI = 0.988, CFI = 0.994). Cronbach's Alpha coefficient has been 0.782 for the scale.

Organizational commitment scale was developed by Karakus and Aslan (2009). This one-factor scale was in accordance with the data (explained variance = 49.052 %, Bartlett = 0.000, KMO = 0.857, χ^2 = 23.508, df = 14, χ^2/df = 1.679, P-value = 0.052, RMSEA = 0.046, IFI = 0.988, TLI = 0.982, CFI = 0.988). Cronbach's Alpha of the scale has been evaluated as 0.812.

Motivation at work scale was developed by Gagné, et al. (2010) and translated into Turkish by Akbolat and Isik (2012). These three factor-scale fit to the data well (explained variance = 75.226 %, Bartlett = 0.000, KMO = 0.842, χ^2 = 36.585, df = 17, χ^2/df = 2.152, P-value = 0.004, RMSEA = 0.060, IFI = 0.982, TLI = 0.971, CFI = 0.982). Cronbach's Alpha of the overall scale was 0.856. Cronbach's Alpha coefficients of three dimensions has been determined as below; Specific regulation: 0.850, Intrinsic motivation: 0.846 and Introject regulation: 694.

Job involvement scale was developed by Griffin et al. (2010) and adapted to Turkish by Demir (2018b). A single factor scale consisting of three items presented a good fit to the data (explained variance = 71.783%, Bartlett = 0.000, KMO = 0.704, χ^2 = 2.445, df = 1, χ^2/df = 2.445, P-value = 0.118, RMSEA = 0.067, IFI = 0.995, TLI = 0.995, CFI = 0.986). Cronbach's Alpha of this scale was calculated as 0.803.

Data Analysis

The collected data were analyzed using SPSS. Data were determined to have a linear and normal distribution. Also, the relationships among the research variables were detected with regard to the multicollinearity problem (Tolerance > .2, VIF < 10). AMOS has been benefitted for confirmatory factor analyses (CFA) and structural equation modeling (SEM) to unveil the dealings among these constructs regarding the proposed model (Arbuckle, 2009). CFA was performed separately for each scale in this study.

CFA is performed after exploratory factor analysis and presents real statistical values (Kline, 2011). CFA tests and confirms whether the data set is suitable for the proposed model or not. SEM has common usage in scientific studies by the virtue of revealing measurement errors regarding observed or unobserved variables and direct and indirect influences of variables in the proposed model (Meydan & Sesen, 2015). AMOS is one of the SEM software programs that are available for examining the relationships among the constructs as correlational and causative in the multivariate studies (Bayram, 2013; Byrne, 2010; Kline, 2011; Meydan & Sesen, 2015). As a consequence of these reasons, this study has utilized SEM via AMOS.

RMSEA, IFI, TLI, CFI, X2/df (CMIN/DF) and the level of significance (p) fit indexes have been noted for the assessment of the goodness of fit model. With RMSEA value being between 0 and 0.08; X2/sd value between 0 and 3; p-value being between 0.01 and 0.05, and the values of IFI, CFI, and NFI between 0.90 and 1.00 reveal good fit indexes (Byrne, 2010; Kline, 2011). In exploratory and confirmatory factor analyses, the least boundary of factor loads are taken as 0.30. If there is a restricted number of items in a scale prepared in the field of social sciences, the lowest boundary can be minimized to 0.30 for factor load (Buyukozturk, 2012; Costello & Osborne, 2005).

Results

Descriptive Statistics and Correlations

The values of descriptive statistics and correlations are given in Table 1.

Table 1.

Descriptive Statistics and Correlation Matrix of the Variables in the Study

Variables	$\overline{X}$	Sd.	std er.	1	2	3	4	5
1.S.E.	3.786	.536	.029	1				
2.Sat.	4.145	.680	.037	.288**	1			
3.Com.	3.072	.792	.044	.249**	.203**	1		
4. Mot.	3.752	.695	.038	.328**	.617**	.365**	1	
5.Inv.	3.406	0.940	.052	.247**	.434**	.279**	.527**	1

*p<.05, **p<.01

Notes: S. E.: Self-efficacy, Sat.: Job satisfaction, Com.: Organizational commitment, Mot.: Motivation, Inv.: Job involvement.

According to the mean scores, self-efficacy, job satisfaction and motivation levels of teachers are slightly high (4). Also, their organizational commitment and job involvement are at a moderate level (3). With reference to the correlation matrix, self-efficacy has a positive correlation with job satisfaction, organizational commitment, motivation and job involvement. Job satisfaction, organizational commitment, motivation and job involvement are all positively correlated with each other. All of the variables are correlated with each other at a 0.01 significance level.

In line with the modification indices, five items were deleted and three error covariances were added to the model. Respectively C8, C2, M10, M11 and M12 items were deleted. C8 (0.138) and C2 (0. 140) were deleted because they had low factor loading under .30. M10, M11 and M12 have been obliterated since their error variance has been so high and it increased chi-square of the model too much. Error covariances have been supplemented between S4 and S5, I1 and I2, M1 and M3 because the errors are related to each other. The measurement model shows that the scales exhibited a goodness of fit index for the data ($x2 = 825.930$, $df = 446$, $x2/df = 1.852$, IFI = .914, TLI = .903, CFI = .913, RMSEA = .052). At this model, all the latent variables have significant and high correlations with each other (Figure 2). The measurement model with standardized coefficients is given in Figure 2.

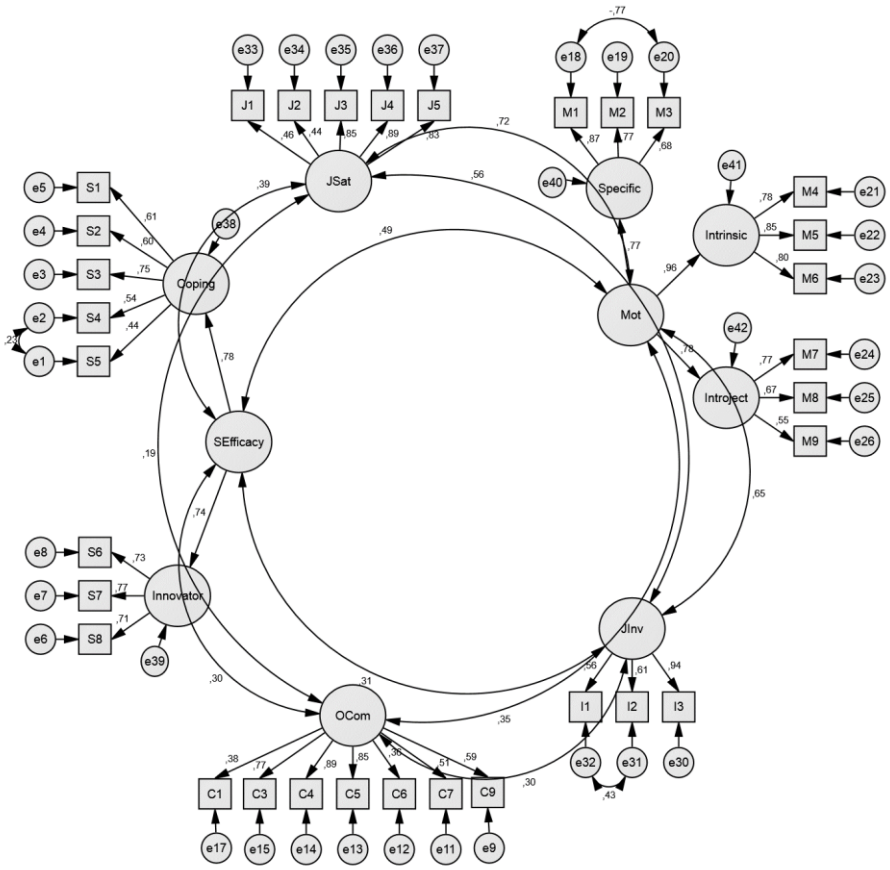

Figure 2. *The Measurement Model*

Notes: SEfficacy: Self-efficacy, JSat.: Job satisfaction, OCom.: Organizational commitment, Mot.: Motivation, Inv.: Job involvement, Coping: Coping business behavior, Innovator: Innovator business behavior. Fit indices: x2 = 825.930, df = 446, x2/df = 1.852, IFI = .914, TLI = .903, CFI = .913, RMSEA = .052).

After presenting the good fit of the measurement model, the covariances between the latent variables have been cleared and one-way paths have been interlarded these latent variables according to the theoretical assumptions. The paths of SEfficacy → JInv (ß = -.036, p = .635), JSat → OCom (ß = .090, p = .133) and OCom → JInv (ß = .093, p = .094) has been erased because of their insignificant path coefficients (Table 1). The final structural model presented a good fit to the data (x2 = 830.522, df = 449, x2/df = 1.850, IFI = .914, TLI = .903, CFI = .913, RMSEA = .052).

Deletions of the insignificant paths for the final structural equation model are presented in Table 1.

Table 1.

Deletions of the Insignificant Paths for the Final Structural Equation Model

	x^2	df	x^2/df	Δx^2	IFI	TLI	CFI	RMSEA
1. Saturated model	825.930	446	1.852	-	.914	.903	.913	.052
2. SEfficacy → JInv	826.149	447	1.848	0.004	.914	.904	.913	.051
3. JSat → OCom	827.757	448	1.848	0.000	.914	.904	.913	.051
4. OCom → JInv	830.522	449	1.850	0.002	.914	.903	.913	.052

Notes: SEfficacy.: Self-efficacy, JSat.: Job satisfaction, OCom.: Organizational commitment, JInv.: Job involvement.

The final structural model which has standardized path coefficients has been presented in Figure 3.

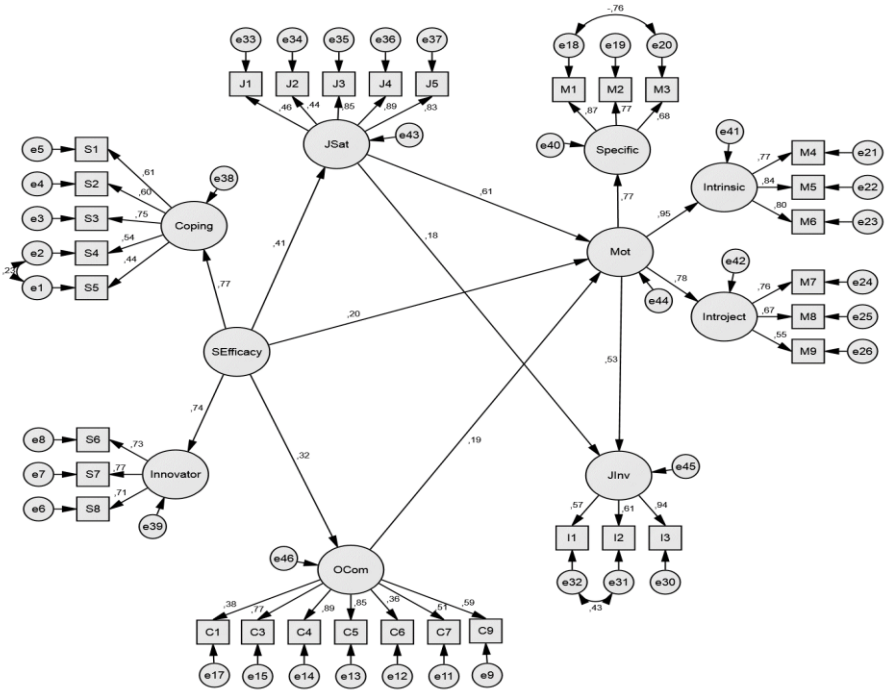

Figure 3. *The Structural Equation Model*

Notes: SEfficacy: Self-efficacy, JSat.: Job satisfaction, OCom.: Organizational commitment, Mot.: Motivation, Inv.: Job involvement, Coping: Coping business behavior, Innovator: Innovator business behavior. Fit indices: x2 = 825.930, df = 446, x2/df = 1.852, IFI = .914, TLI = .903, CFI = .913, RMSEA = .052).

According to the structural model that yields the fit indices, as teachers' self-efficacy beliefs enhance, job satisfaction, organizational commitment, motivation and job involvement levels increase. Both job satisfaction and organizational commitment partially mediate the relationship between teachers' sense of self-efficacy and motivation. Self-efficacy beliefs positively affect teachers' job involvement through the full mediation effect of job satisfaction and motivation. Organizational commitment and motivation fully mediate the relationship between teachers' self-efficacy and job involvement (Figure 3).

Discussion, Conclusion and Recommendations

Previous studies have demonstrated that teachers' self-efficacy beliefs concerned with teaching practices and managing challenges are highly correlated to the extent that they are confident about their potential to accomplish the new achievements on their profession (Rosario et al., 2009). When the related literature was examined there is no available research including and regarding the sense of self-efficacy, job satisfaction, organizational commitment, motivation and job involvement altogether. This study conducted a model for better understanding of the present level of self-efficacy beliefs of teachers in educational organizations. Structural equation modeling also collaborated on a conceptual model in which teachers' self-efficacy beliefs predicted their job satisfaction, organizational commitment, motivation and job involvement.

This study revealed that self-efficacy beliefs positively affects teachers' job satisfaction, organizational commitment, motivation and job involvement. Similarly, other studies revealed that sense of self-efficacy positively affects job satisfaction (Caprara et al., 2006; Gkolia et al., 2014), organizational commitment (Busch et al., 1998; Mulvaney, 2014; Tsai, Tsai, & Wang, 2011), motivation (Rosario et al., 2009; Tschannen-Moran & Woolfolk Hoy, 2001; Tschannen-Moran et al., 1998; Woolfolk & Hoy, 1990) and job involvement (Yang et al., 2006). In the related literature, self-efficacy refers to an organizational facilitator to attain positive outcomes (Betoret & Artiga, 2010; Hefferon & Boniwell, 2011). The perceptions of self-efficacy have an impact on teachers' behaviors, level of commitment, and job performance (Caprara et al., 2006; Yang et al., 2006). These results reveal the accuracy of hypothesizes stated in H1, H2, H3, and H4.

Related studies revealed that self-efficacy has a direct impact on job satisfaction (Caprara et al., 2006; Gkolia et al., 2014). Kinicki et al. (2002) found in their meta-analysis that job satisfaction positively influences motivation. Self-efficacy also positively predicted motivation (Rosario et al., 2009; Tschannen-Moran & Woolfolk Hoy, 2001; Tschannen-Moran et al., 1998; Woolfolk & Hoy, 1990). Similar to these findings, this current study pointed out that self-efficacy is a predictor for teachers' motivation through the partial effect of job satisfaction. Therefore, hypothesis V was confirmed.

Related studies revealed a positive relationship between self-efficacy and organizational commitment (Busch et al., 1998; Mulvaney, 2014; Tsai et al., 2011). Researchers found out that organizational commitment is an important predictor for obtaining work motivation (Battistelli et al., 2013; Lunenburg & Ornstein, 2012). As mentioned, self-efficacy also positively predicted motivation (Rosario et al., 2009; Tschannen-Moran & Woolfolk Hoy, 2001; Tschannen-Moran et al., 1998; Woolfolk & Hoy, 1990). Similar, to these findings, this study revealed that self-efficacy is a predictor of teachers' motivation through the partial effect of organizational commitment. Therefore, hypothesis VI was confirmed.

If teachers have perceptions of self-efficacy, they will be gratified with their job and devote themselves to their organization due to managing the given tasks effectively. Positive perceptions enable to an increase in other sets of perceptions. All of these positive emotions together provide teachers to be more motivated in their professions.

Brown (1996) showed the relationship between job satisfaction, organizational commitment, motivation and job involvement. Previous studies (Donmez, 2013; Lunenburg & Ornstein, 2012; Saygin & Saygin, 2016) indicate that motivation is positively correlated with job performance. If teachers have a sense of self-efficacy, they are satisfied with their job and committed to their job; therefore, they are highly motivated to do challenging tasks. Murray (2014) indicates that positive attitudes provide high performance and fondness of work. Similar, to these findings, this present study also showed that self-efficacy is a predictor of teachers' level of job involvement through the partial effect of job satisfaction, organizational commitment, and motivation. Hence hypothesis VII was confirmed.

This current study pointed out that job satisfaction has a direct and indirect impact on job involvement. Similarly, Demir (2018b) found that teachers' level of job satisfaction positively influences their job involvement. On the contrary, Knoop (1995) revealed that nurses' level of job involvement isn't correlated with their overall job satisfaction, but only in the aspects of satisfaction with work and promotion opportunities. It has been extrapolated that taking a different consequence aside from current studies may be gathered by taking samples from organizations in different cultural structures or differentiation of scale factor structures.

Even if organizations have all these sources such as raw material, capital related to economy and state of the art technology, if they are not with skilled employees who have positive attitudes and behaviors, they will suffer extreme hardship. Creating a struggling organization is just possible by qualified individuals. Given these realities, this study examined how to increase teachers' positive attitudes. This study clears up that self-efficacy is a predictor of job satisfaction, organizational commitment, motivation and job involvement. In the related literature, these terms are known as performance variables. Motivation and job involvement levels of the teachers increase By increasing their self-efficacy beliefs, job satisfaction and organizational commitment. In this way, teachers wage the education and training activities influentially and exuberantly.

School administrators should be recommended to struggle to enhance the teachers' self-efficacy beliefs in order to increase positive attitudes at schools, in this way teachers' performance can enhance. Furthermore, educational programs may be edited on the purpose of increasing teachers' perception of self-efficacy. Educational programs are extremely important for developing personal experiences and feeling competent.

As limitations, this study focuses on the educational environment. This makes it difficult to make a comparison for any profit organization. The researcher recommends a quantitative study combined with a qualitative study to reveal in-depth relations among these variables. In spite of these restrictions, the outcomes of this study present valuable new aspects regarding the relationship between self-efficacy, job satisfaction, organizational commitment, motivation and job involvement as they are applied to the profit and non-profit organizations.

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Öz Yeterliğin İş Doyumu, Örgütsel Bağlılık, Motivasyon ve İşe Sargınlıktaki Rolü

Atıf:

Demir, S. (2020). The role of self-efficacy in job satisfaction, organizational commitment, motivation and job involvement. *Eurasian Journal of Educational Research*, 85, 205-224, DOI: 10.14689/ejer.2020.85.10

Özet

Problem Durumu: Örgütler; ekonomi ile ilişkili sermayeye ve her türlü ham maddeye ve teknolojiye sahip olsalar da pozitif tutum ve davranışları olan, nitelikli çalışanlara sahip olmadıkça pek çok zorlukla karşılaşırlar. Yaşayan ve rekabet eden bir örgüt, öz yeterlik inançları olan çalışanlarla oluşturulabilir. Öz yeterlik inançları yüksek düzeyde olan öğretmenler, işlerini yaparken kapasitelerini tam olarak kullanabilir ve zorlu görevleri başarabilir. Bu kişilerin öz yeterlik algılarının yüksek düzeyde olması, işe karşı geliştirdikleri tutum ve davranışlarını da olumlu etkiler. Eğitim örgütlerinde, kritik değişkenlerle ilişkili olduğu bilinen öz yeterlik algısına ilişkin sınırlı sayıda araştırma bulunmaktadır. Ayrıca eğitim örgütlerinde iş doyumu, örgütsel bağlılık, motivasyon ve işe sargınlık değişkenlerinin öz yeterlikle bir arada işlendiği bir araştırmaya rastlanılmamıştır. Bu araştırma alternatif modeller üretilmesine ve kavramlar arasındaki ilişkilerin daha iyi anlaşılmasına olanak sağlamaktadır.

Araştırmanın Amacı: Bu çalışmada; öğretmenlerin öz yeterlik inançları ile iş doyumu, örgütsel bağlılık, motivasyon ve işe sargınlık düzeyleri arasındaki ilişkinin açığa çıkarılması amaçlanmaktadır.

Yukarıdaki araştırmanın amacı bağlamında şu hipotezler test edilmiştir:

H1: Öğretmenin sahip olduğu öz yeterlik inancı, iş doyum düzeyini pozitif olarak etkilemektedir.

H2: Öğretmenin sahip olduğu öz yeterlik inancı, örgütsel bağlılık düzeyini pozitif olarak etkilemektedir.

H3: Öğretmenin sahip olduğu öz yeterlik inancı, motivasyon düzeyini pozitif olarak etkilemektedir.

H4: Öğretmenin sahip olduğu öz yeterlik inancı, işe sargınlık düzeyini pozitif olarak etkilemektedir

H5: Öğretmenin sahip olduğu öz yeterlik inancı, iş doyumunun aracılık etkisiyle motivasyon düzeyini pozitif olarak etkilemektedir.

H6: Öğretmenin sahip olduğu öz yeterlik inancı, örgütsel bağlılığın aracılık etkisiyle motivasyon düzeyini pozitif olarak etkilemektedir.

H7: Öğretmenin sahip olduğu öz yeterlik inancı; iş doyumu, örgütsel bağlılık ve motivasyonun aracılık etkisiyle işe sargınlık düzeyini pozitif olarak etkilemektedir.

Araştırmanın Yöntemi: Bu çalışmada iki ya da daha fazla değişken arasındaki ilişkilerinin yönünü ve düzeyini ortaya koyan ilişkisel tarama deseni kullanılmıştır. Araştırmanın çalışma evreni; 2017-2018 eğitim öğretim yılında Hatay il merkezindeki ortaokullarda görev yapan öğretmenlerdir. Bu araştırmada küme örnekleme yöntemi kullanılmıştır. Hatay il merkezindeki her ortaokul bir küme olarak değerlendirilip okullar rastgele seçilmiştir. Seçilen 33 okulda görev yapmakta olan 321 öğretmen, bu araştırmanın örneklemini oluşturmaktadır. Verilerin toplanmasında; öz yeterlik ölçeği, iş doyumu ölçeği, örgütsel bağlılık ölçeği, motivasyon ölçeği ve işe sargınlık ölçeği olmak üzere beş farklı ölçekten yararlanılmıştır.

Araştırmanın Bulguları: Öğretmenlerin bu araştırmada, yararlanılan ölçme araçlarındaki maddelere katılım düzeylerini ortaya koyan aritmetik ortalama ve standart sapma değerleri incelendiğinde; öz yeterlik, iş doyumu ve motivasyon düzeylerinin kısmen yüksek düzeyde olduğu görülmüştür. Öğretmenlerin örgütsel bağlılık ve işe sargınlık düzeylerinin ise orta düzeyde olduğu açığa çıkarılmıştır. Öğretmenlerin öz yeterlik algıları; iş doyumu, örgütsel bağlılık, motivasyon ve işe sargınlık düzeyleriyle pozitif korelasyona sahiptir. Öğretmenlerin öz yeterlik inançları ile iş doyumu ve işe sargınlık düzeyleri arasında pozitif bir korelasyon bulunmaktadır. Bunun yanı sıra iş doyumu, örgütsel bağlılık, motivasyon ve işe sargınlık düzeyleri birbiriyle pozitif anlamlı ilişkilidir. Bütün değişkenler, birbiri ile .001 anlamlılık düzeyinde ilişkilidir. Yapısal eşitlik modellemesi analizi ile test edilen ve en iyi uyum değerlerini üreten yapısal modele göre; öğretmenlerin sahip oldukları öz yeterlik inançları; iş doyumu, örgütsel bağlılık, motivasyon ve işe sargınlık düzeyleri üzerinde pozitif bir etkiye sahiptir. Öğretmenlerin öz yeterlik algıları; iş doyumu ve örgütsel bağlılık düzeylerinin kısmı aracılık etkisi ile motivasyon düzeylerini arttırmaktadır. Öğretmenlerin öz yeterlik inançları; iş doyumu ve motivasyonun tam aracılık etkisiyle işe sargınlık düzeylerini arttırmaktadır. Öğretmenlerin öz yeterlik algıları, örgütsel bağlılık ve motivasyonun tam aracılık etkisi ile işe sargınlık düzeyleri üzerinde pozitif bir etkiye sahiptir. Öz yeterlik; örgütsel bağlılık ve motivasyonun tam aracılık etkisi ile öğretmenlerin işe sargınlık düzeylerini arttırmaktadır.

Sonuç ve Öneriler: Bu araştırma; öz yeterlik inancının öğretmenlerin olumlu tutumsal çıktılarını nasıl arttırdığı konusunda önemli bilgilere ışık tutacak şekilde tasarlanmıştır. Bu araştırma; öz yeterlik inancının iş doyumu, örgütsel bağlılık, motivasyon ve işe sargınlık değişkenlerini etkilediğini ortaya çıkarmaktadır. Öz yeterlik; bireylerin işten elde ettikleri memnuniyetlerini, okullarına bağlılıklarını, çalışmaya duydukları isteklerini, gayret düzeylerini ve zorlu görevler karşısında gösterdikleri çabaları arttırmaktadır. Bu araştırma diğer örgütlerde olduğu gibi eğitim örgütlerinde de önemli performans çıktıları sunan öz yeterlik, iş doyumu, örgütsel bağlılık, motivasyon ve işe sargınlık kavramlarına yoğunlaşılması açısından diğer çalışmalara da kuramsal çerçeve oluşturmaktadır. Bu araştırmayla birlikte öğretmenlerin öz yeterlik inançlarının önemine ilişkin bir bakış açısı sunulmaktadır. Ayrıca öğretmenlerin yapabileceklerine inanç duymalarını sağlayan, bu yolla okuldaki olumlu tutumlarını arttıran ve eğitim çevrelerine katkılar sunan öz yeterlik

kavramı ile bazı anahtar değişkenlere ilişkin yapısal bir model üretilmiş ve bu model ampirik olarak test edilmiştir. Eğitim örgütleri öğretmenlerin; daha huzurlu, iş doyumları, bağlılıkları ve motivasyonları yüksek, işe sargınlıkları fazla olmalarına katkı sunacak ortamlar oluşturabilmelidir. Bu araştırmada ortaya koyulan ilişkilerin nedenlerinin derinlemesine incelendiği çalışmaların tasarlanmasıyla bu kavramlara ilişkin daha iyi bir anlayış sunulabilir.

Anahtar Sözcükler: Öz yeterlik, tutumsal çıktılar, aracılık etkisi, performans, verimlilik.

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Compliance of Accounting Education Programs with International Accounting Education Standards: The Case of IES 3 in Tunisia

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ABSTRACT

Purpose: International literature shows that employability skills of accounting graduates are considered as a major issue in the economies of the 21st. The literature on accounting education shows that little research has been conducted on Arab students in the North Africa region. Studies on accounting education research have used different techniques and methods, but Partial Least Squares–Structural Equation Modeling (PLS-SEM) has gained very little concern. The present study aims to empirically assess the employability skills of accounting graduates under Accounting International Education Standards (IESs) in Tunisia as a MENA country.

Research Methods: In this study, cross-sectional design with a questionnaire survey is adopted to obtain the perception of different respondents. Our study was based on multi-stakeholder analysis and a survey of 419 respondents, including university teachers, professional accountants and recent graduates in Tunisia. PLS-SEM was performed with Lisrel 8.8, using maximum likelihood estimates, to test the hypothesized models.

Findings: The findings showed that the accounting education program in Tunisia allowed the development of intellectual, organizational and general skills significantly. However, interpersonal and communication skills were considered as the weak link of the accounting education program in Tunisia with the agreement of all respondents. In addition, divergent views were noted regarding the ability of the Tunisian accounting education program to develop technical and functional skills and personal skills.

Implications for Research and Practice: These findings have implications for accounting academics in different universities, different employers and the target government authorities as well as the target IFAC member bodies.

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Introduction

Learner differences have always been the main concern of researchers in the field. Many studies have emphasized the importance of professional skills and the need for their availability in the accounting education program (Jackling &Keneley, 2011; Milliron, 2012). In addition, a considerable amount of research has emphasized that the improvement of the employability of accounting graduates should be realized by improving the quality of accounting education programs to allow the enhancement of skills (Freeman et al., 2008; Gammie&Cargill, 2002; Thompson et al., 2008). However, overwhelming body of previous research has shown that professional skills requirements are not met in many countries, such as the United States of America, Great Britain and Australia, but also in Asian countries, such as China, where dissatisfaction about the quality of accounting graduates is relatively disturbing (Albrecht &Sack, 2000; Bui &Porter, 2010; Awayiga et al., 2010). These studies have also indicated that, from the perspective of practitioners and employers, accounting education is insufficient to meet the requirements of the accounting profession.

Accordingly, the International Federation of Accountants (IFAC) has created the International Accounting Education Standards Board (IAESB), an independent standard-setting body replacing the former IFAC' Education Committee. The primary mission of IAESB is to establish and evolve international accounting standards for accounting education and oversees their implementation worldwide to ensure enhancing, the quality of the accounting education program at international level (St Pierre &Rebele, 2014), helping for possible accreditation of the academic program internationally (AACSB, 2013) and providing the necessary competence of professional accountants that is needed by different decision-makers in the economic environment.

Sugahara and Wilson (2013) suggest further academic research on the issues regarding International Education Standards (IESs) due to a lack of awareness and recognition of accounting IESs articles in accounting publications. Indeed, very little empirical research has been conductedon IESs issues for accounting (such as Yusof&Noh, 2016; Razak, 2016; Frijat&Shbeilat, 2016; Majzoub&Aga, 2015; Lucianelli&Citro; 2018). Moreover, on the one hand, the content analysis method was largely used as a research method in the area of IESs literature (Yusof&Noh, 2016; Razak, 2016; Frijat&Shbeilat, 2016). On the other hand, analysis tools were limited only to descriptive statistical tools (Lucianelli&Citron; 2018), or to the use of the T-test and the ANOVA method (Majzoub&Aga, 2015).

To our knowledge, international literature shows that no previous studies have empirically researched the issue of employability skills under Accounting IESs in the Tunisian context. Hence, the present paper addresses this deficiency by examining the compliance level of employability skills of accounting graduates with the Accounting IESs in Tunisia as a North African country using the partial least squares–structural equation model. Therefore, our principal research question we consider is as follows: Are employability skills obtained at universities and higher education institutions of accounting in Tunisia in harmony with the Accounting IESs requirements?

The investigation of the Tunisian context is well-timed since promoting Education quality was at the center of the reforms of the 2011 Tunisian revolution (Eid Mohamed et al., 2016). In this sense, the Organisation for Economic Co-operation and Development (OECD) recommends the improvement of theconnection between vocational and academic programs in Tunisia (OECD, 2015). Furthermore, the recent events in Tunisia related to the Arab spring require further research on the issues concerning the quality of education and skills development (Gyimah-Brempong and Ondiege, 2011).

Moreover, this study is motivated by the report issued by the Centre for Financial Reporting Reform (CFRR, 2011) on "Accountancy Education Benchmarking Study: Albania, Bosnia and Herzegovina, Kosovo, Macedonia FYR, Montenegro and Serbia." The study recommended the development of accounting education through the alignment of academic accounting programs with the needs of the employers and the profession. In addition, it proposed more integration and recognition of local programs at the international level by application for accreditation from an international accreditation organization. It also suggested the development of professional skills in compliance with IESs to reduce the gap between students and the labour market requirements.

This study makes a significant contribution to the accounting education literature as follows. First, this study contributes meaningfully to extend the existing body knowledge of Accounting IESs literature by examining the employability skills compliance level with IESs in the Tunisian context. Results are, therefore, expected to provide a better understanding of compliance with the IESs in different areas of the world on international accounting education issues. Furthermore, this study provides a particular contribution to the accounting education works connected with the Middle East and North Africa (MENA), as many studies were performed on the Western-based accounting education systems, and, therefore, little research has been conducted on Arab students in North Africa region. In addition, Tunisia also represents one of the few areas that are less investigated in international accounting education literature. Finally, our study makes a noteworthy methodological contribution to the Accounting IESs research using the PLS-SEM approach, as the data analysis technique, since it remains underused in the investigation of latent phenomena in the field of accounting research (Hampton, 2015; do Nascimento&da Silva Macedo, 2016).

To deal with the above research question, this study used a survey of 419 respondents, including university teachers, professional accountants and recent graduates in Tunisia. In addition, the partial least squares–structural equation (PLS-SEM) approach has been used to analyze data for hypotheses testing purposes. Although the benefits and the widespread use of Structural Equation Modeling (SEM) in the international literature, the method based on Partial Least Squares (PLS-SEM) is still underused in accounting research (do Nascimento&da Silva Macedo, 2016). Accordingly, the use of PLS-SEM in this investigation presents an original methodological contribution in Accounting IESs literature.

Thisstudy is organized as follows. The next section reviews the extant relevant literature on similar research issues about professional skills and international accounting education standards. It also highlights the conceptual framework used in the current study and points out our empirical research hypotheses. Section 3 describes and discusses the research methodology. Section 4 presents our research findings and discussion. The final section concludes the paper.

Research Background, Relevant Literature and Research Hypothesis

Professional Skills under IES 3

O'Connell et al. (2015) emphasize the importance of developing accounting graduates' professional skills and note that accounting education is principally concerned with developing professional knowledge and professional skills. Under old version of IES 3, Professional Skills and General Education, issued by the IAESB in May 2004 and effective on 1 January 2005, Professional skills are organized into five categories (IFAC, 2008): (i) Intellectual skills- are about the ability of a professional accountant to solve problems, to make decisions, and to exercise professional judgment, (ii) Personal skills- are about the personal attitudes and behaviour of a professional accountant (e.g. self-management, the ability to anticipate and adapt to change, professional skepticism, initiative, influence and self-learning), (iii) Interpersonal and Communication skills- enable a professional accountant to work and interact effectively with others, (iv) Technical and Functional skills- include general skills and specific accounting skills (e.g. IT, reporting, measurement, numeracy, risk analysis and decision modeling, and compliance with regulatory and legislative requirements), (v) Organizational skills- enable professional accountants to achieve the best results and outcomes from people and resources available by working effectively with and within the organization to do his job in an effective manner. However, The Technical and Functional skills had been removed in the revised IES 3 (IAES, 2012), Initial Professional Development – Professional Skills, which is based on the learning outcome approach and effective on 1 July 2015. As a result, professional skills, which are required for a competent professional accountant, become grouped into four competences areas instead of five categories.

Although The IAESB emphasizes the importance of general education, as an essential part, in the development of professional competence of professional accountants, IAESB does not consider general education as a compulsory component and a requirement within the development of professional skills prescribed under the revised IES 3 (IAES, 2012).

Related Literature Review and Research Hypotheses

There have been many studies addressing the issue of skills acquired under the accounting education system in many countries around the world. In an empirical study focused on three categories of respondents: graduate students, teachers and professional accountants, and aimed at identifying the desired knowledge and skills elements in the accounting education programs to meet the challenges of change in the business environment of China, Lin (2008) showed the existence of six areas of

knowledge and skills that must be included in the accounting education program, namely: administrative skills, management skills, specialized accounting knowledge, personal characteristics, general knowledge, technical knowledge and basic skills.

In the same vein, Awayiga et al. (2010) assessed the accounting education in Ghana and its positioning from the perspective of employers and graduate students. The findings highlighted a gap between accounting education and the work environment. Moreover, results showed that there is a consensus among employers and accounting graduates regarding the need to include professional skills in accounting education programs. They also found that analytical and critical skills actually represent intellectual skills and are the most important among professional qualities that accounting practitioners should acquire. In addition, the authors pointed out that graduate students considered that the technical and functional skills wereless important, while employers believed that communication skills are the least important.

Furthermore, Jackling and Lange (2009) investigated technical and general skills included in the content of the university accounting education from the point of view of graduate students and employers in Australia. They found that employers assume that accounting graduates have technical skills related to accounting practices and procedures, but they demonstrate a clear lack of general skills, such as teamwork, which is purely an organizational skill, and personal communication skills. They also pointed out that there is a gap between the academic educational content and skills needed to develop the accounting profession.

The study of Needle JR (2010) highlighted the significant impact of globalization on both accounting education and accounting educators. In addition, the study demonstrated the importance of the skills that must be acquired by accounting graduates to meet the skill requirements of the accounting profession and the expectations of accounting practitioners and different economic decision-makers (Webb and Chaffer, 2016).

All of these empirical investigations call on the researchers and the intervening parties to find mechanisms that offer skills in academic programs meeting, on the one hand, the needs of the labour market and the nature of the accounting profession on the other hand.

On the other hand, looking at the Accounting Education literature context, we observed that there is very little empirical research on (IESs) issues for accounting. Indeed, focusing on professional and research discourse around accounting IESs in published academic articles, Sugahara and Wilson (2013) found that there is a lack of awareness and recognition of accounting IESs articles in accounting publications, and therefore, suggested further academic research on the issues regarding accounting IESs.

Within the framework of descriptive research, Zenuni and Miti (2017) discussed the importance of the adoption of IESs for accounting and the need forAlbania to implement and comply with IESs. They also highlighted levels of compliance with

IESs in different countries. Al Jalili and Dhanoon (2010) focused attention on the crucial importance of international accounting education for the development of accounting curricula and the professional skills of accounting graduates at Iraqi universities. Saville (2007) concisely described the framework of the International Education Standards (IESs) for Professional Accountants by explaining the nature and the scope and by setting out the overall requirements of each standard. McPeak et al. (2012) outlined the International Accounting Education Standards and identified the existence of some key factors influencing the development and the application of international accounting education standards, namely: Differing cultures, languages, and social, educational, and legal systems. These factors are considered achallenge for the International Accounting Education Standards Board (IAESB). Furthermore, the study recommended the need to implement these standards (IESs) and to include them in the content of accounting education programs in order to develop and improve the skills of professional accountants in accordance with the requirements of the labour market. The authors also suggested the involvement of accounting educators and practitioners to help the IAESB in assessing and developing accounting education programs.

The content analysis method was widely used to examine the compliance level with International Accounting Education Standards. In this context, Yusof and Noh (2016) conduct a study on the level of compliance with IES 2 among IFAC's member bodies. Findings revealed partial compliance with IES 2 among both developing countries and developed countries. Razak (2016) investigated the compliance level of accounting programs in Saudi universities with the International Accounting Education Standards (IAES) in the development of study plan and curricula. The findings indicated thatexceptfor non-offering a stand-alone course in professional ethics and values, the majority of Saudi universities comply with IES 2. Similarly, Almotairy and Stainbank (2014) found that the professional accounting education system in Saudi Arabia does not fully comply with Accounting IESs requirements. Frijat and Shbeilat (2016) sought to examine the extent to which accounting educations programs in Jordanian universities comply with accounting IES 2 requirements. The findings revealed that Jordanian universities do not comply with IES 2. Further, the study recommended the standardization of accounting education programs at Jordanian universities with accounting IES requirements.

Based on the case study approach, Watty et al. (2013) examined the perception and valuation of International Education Standards (IES) member bodies and academics in three counties in Australia, Japan and Sri Lanka. Their result gave evidence of an acceptable level of awareness of IES and recognition of the value of IES as benchmark standards for accounting education among the professional bodies for the three countries. Besides, language and translation, culture and learning approaches and recognition of countries are the most important obstacles reported by both professional bodies and academics

Using the T-test and the ANOVA as statistical analysis tools, Majzoub and Aga (2015) investigated the gap between accounting educational system and practice in Lebanon with reference to the International Accounting Education Standards (IAESs)

in general, by surveying recent graduates, professors, department heads, employees and employers. The empirical findings showed that professors and employers have the same perceptions of non-compliance of professional competencies with IAESs requirements. In addition, technical competencies are seen by employers as are not at the level required by IAESs. Furthermore, students' perceptions were considered as being overestimated concerning professional and technical competencies.

Limited to descriptive statistical tools of 21 interviewees, Lucianelli and Citro (2018) investigated empirically the professional accountants' views on the level of compliance of Italian university programs with the International Education Standard (IES2). The finding indicated that Italian university programs did not comply with all the requirements of IES2.

Although this little body of empirical research which deals with the IESs issues for accounting, it is noted that, to the best of our knowledge, no previous research hasempirically investigated the IESs for accounting in the Tunisian context. Accordingly, this study addresses this deficiency in accounting education works connected with the Middle East and North Africa (MENA) using the PLS-SEM approach as an original statistical tool in the accounting IESs literature.

Based on the conceptual framework reported above and findings from prior research, it would seem that enhancing employability of accounting graduates in Tunisia requires the design of an accounting education program enabling the development of professional skills specified under the IES 3 (Chatman, 1991; Freeman et al., 2008; Gammie&Cargill, 2002; Thompson et al., 2008). Hence, the need to investigate the compliance professional skills, obtained at universities and higher education institutions of accounting in Tunisia, with the IES 3. Therefore, the following hypotheses were proposed:

H1: The higher education of accounting currently applied in Tunisia allows accounting graduates to develop intellectual skills.

H2: The higher education of accounting currently applied in Tunisia allows accounting graduates to develop technical and functional skills.

H3: The higher education of accounting currently applied in Tunisia allows accounting graduates to develop personal skills.

H4: The higher education of accounting currently applied in Tunisia allows accounting graduates to develop interpersonal and communication skills.

H5: The higher education of accounting currently applied in Tunisia allows accounting graduates to develop organizational and business management skills.

H6: The higher education of accounting currently applied in Tunisia allows accounting graduates to develop general skills.

Figure 1 provides an overview of the study's proposed theoretical model regarding professional skills to be tested in this study.

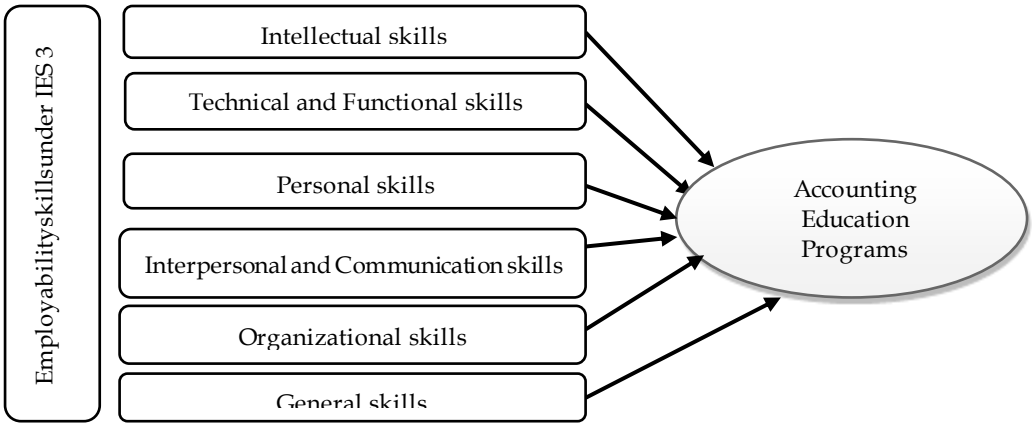

Figure 1. *General Theoretical Model and Research Hypotheses.*

Method

Research Design

A quantitative approach was selected to assess the employability skills of accounting graduates under IESs in the Tunisian context (as depicted in Figure 1 above). This research was designed as a cross-sectional design with a questionnaire survey to obtain the perception of different respondents and the Partial Least Square Structural Equation Modeling (PLS-SEM) was adopted to verify our six hypotheses.

Research Sample

The target population for this study is composed of the accounting teachers in higher education institutions of accounting in Tunisia, professional accountants, and recently hired accounting graduates who benefited directly from the process of accounting education in Tunisia. The nature of the study leads us to adopt the convenience nonprobability sampling procedure, a method of sampling frequently used in the studies where variables are quantitative (Etikan et al., 2016) to select easily the most accessible subjects (Marshall,1996).

Data Collection Tool and Research Data

Data for this study were collected using a specially designed questionnaire, as a research instrument for the measurement of a complicated mental phenomenon, such as opinion and attitudes, in an empirical investigation. The survey questionnaire seeks to measure the attitudes toward professional skills compliance in the accounting education environment of Tunisia using a five-point Likert-type scale, where 1 refers to the lowest score of importance and 5 refers to the highest score of importance.

The survey questionnaire comprises 32 skills developed with reference to IES 3 under the version of 2005 (IFAC, 2008) and also on the basis of the skilled specified in

previous literature. The survey questionnaire was distributed to atotal of 150 teachers, eightquestionnaires were excluded because it was not valid for statistical analysis and 142 questionnaires were selected for statistical analysis (94.66%). As for accounting graduates, a total of 150 usable questionnaires out of 150 (100%) were returned and maintained for statistical analysis. Moreover, 150 survey questionnaires were also sent to professional accountants, and 127 valid questionnaires were returned and adopted (84.66%) for data analysis. Thus, this study obtained a valid available sample of 419 respondents out of 460 for a 91.09% response rate, including university teachers, graduate students and professional accountants.

Data Analysis

Partial Least Squares–Structural Equation Model (PLS-SEM), with Lisrel 8.8, was conducted to test the research hypotheses. SEM is a statistical tool of data analysis that allows researchers to simultaneously evaluate the validity of measures of a set of constructs (measurement model) using Factor Analysis approach, and to assess the strength of multiple relationships between a set of independent variables and one or more dependent variables (structural Model) using Path Analysis approach (Sarstedt et al.,2014; do Nascimento&da Silva Macedo, 2016; Chin, 1998). PLS is a flexible SEM technique without a specific assumption about data distribution (Vinzi et al., 2010). It is appropriate in the situation where the sample size is relatively small and/or there is not a considerable amount of available prior theory (Wong, 2013). In addition, it offers better results for exploratory studies purposes because it has aparticular characteristic of running as multiple regression analysis (Hair et al.,2014).

Results

Descriptive Analysis

Table 1 displays the demographic characteristics of the respondents, namely accounting teachers, professional accountants and graduate students. Concerning accounting teachers, results highlightedthat the majority of respondents were women (58.5%), holding the rank of assistants (77.5%), affiliated with the University of Manouba (26.1%) and with academic experience between fiveand tenyears. Regarding professional accountants, most part of the respondents is composed of men (72.4%), acting as independent accountants (57.5%) and with an experience that varies between fiveand tenyears. With respect to graduate students, Table 1 showsthat the research sample was composed mainly of men (57.3%). It also points out that the number of respondents wasalmost the same for each university (30 graduate students). It is also revealed that the research sample wascomposed mainly of men (57.3%).

Table 1.

The Demographics of the Respondents

	Teachers		**Professionals**		**Recent graduates**	
	Frequence	Percent	Frequence	Percent	Frequence	Percent
Gender						
Male	59	41.5	92	72.4	86	41.5
Female	83	58.5	35	27.6	64	58.5
Total	**142**	**100**	**127**	**100**	**150**	**100**
University granting the degree						
University of Manouba					30	20
University of Tunis					30	20
University of Carthage					30	20
University of Tunis-El Manar					31	20.7
Private University					29	19.3
Total					**150**	**100**
Academic Ranks						
Professor	2	1.4				
Associate Professor	7	4.9				
Assistant Professor	23	16.2				
Lecturer	110	77.5				
Total	**142**	**100**				
Function						
Chartered Accountant			14	11		
Independent Accountant			73	57.5		
Chief Accountant			40	31.5		
Total			**127**	**100**		
Experience (years)						
< 5	10	7	20	15.7		
10-May	61	43	32	25.2		
15-Oct	45	31.7	34	26.8		
15-20	15	10.6	19	15		
20-25	7	4.9	9	7.1		
>25	4	2.8	13	10.2		
Total	**142**	**100**	**127**	**100**		
University Affiliation						
University of Manouba	37	26.1				
University of Tunis	21	14.8				
University of Carthage	16	11.3				
University of Tunis-El Manar	36	25.3				
Private University	32	22.5				
Total	**142**	**100**				

Measurement Model Analysis

The measurement model wasevaluated concerningthe reliability and validity test for each construct (Hair et al., 2011). To this end, the reliability and validity analysis for the six latent constructs wereperformed to assess the suitability of the items and the internal structure of the constructs that the research instrument measures.

Reliability and Validity Analysis of Measures

Cronbach's alpha coefficient is used to test the internal consistency for each construct. The Cronbach's alpha values are above the recommended 0.60 threshold (Bagozzi and Yi, 1988; Fornell and Lacrker, 1981) and rangedfrom 0.66 to 0.94 for all constructs, as shown in Table 2, lending support for the internal consistency of items under each latent construct.

Kaiser-Meyer-Olkin (KMO) coefficient is tested to verify the sampling adequacy for the Exploratory Factor Analysis (EFA) process. It is above Kaiser's recommended threshold of 0.6 (Kaiser, 1974). Bartlett's Test of Sphericity is used to examine whether correlations between items are sufficiently large for the EFA process. It is significant with a p-value of 0.00 ($p < 0{,}0005$), giving a strong proof that the correlation matrix wasnot an identity matrix.

Table 2.

The Cronbach's Alpha for Latent Constructs

Latent Variables	Items	Teachers	Professionals	Recent graduates
Intellectual skills	3	0,886	0,818	0,79
Technical and Functional skills	5	0,947	0,838	0,756
Personal skills	5	0,807	0,861	0,664
Interpersonal and Communication skills	7	0,749	0,79	0,786
Organizational skills	4	0,718	0,748	0,852
General skills	8	0,854	0,779	0,771

Therefore, the EFA technique with Principle Component Analysis (PCA), as the extraction method, was performed for each latent construct. It is found, as shown in Table 3, that the six latent constructs hadeigenvalues greater than one, providing evidence for the unidimensionality of the scales. Moreover, the percentages of explained variance for each latent construct weremore than 50% for the three samples (teachers, professional accountants and students) following the threshold recommended by Streiner (1994).

To confirm that the hypothesized model provides a good fit to the data, the Confirmatory Factor Analysis (CFA) process, using Structural Equation Modeling (SEM,) is performed, with Lisrel 8.8, from the factor structure obtained in the EFA (with CPA) and the maximum likelihood method waschosen to estimate all models.

Table 3.

The Principal Component Analysis of Latent constructs

Latent Variables	Items	Teachers	Professionals	Recent graduates
Intellectual skills	3	81,590	83,172	82,088
Technical and Functional skills	5	85,024	85,871	85,168
Personal skills	5	86,430	86,458	87,345
Interpersonal and Communication skills	7	91,641	94,246	92,202
Organizational skills	4	86,595	86,591	87,537
General Skills	8	83,302	87,526	83,172

Goodness of Test Results for Measurement Models

The goodness of fit (GOF) indices for the measurement models for all constructs are shown in Table 4. In fact, several (GOF) indices wereused to assess the confirmatory factor analyses and structural equation models.Weselect the following indices following (Roussel et al., 2002): GFI (Goodness of Fit), AGFI (Adjusted Goodness of Fit), RMSEA (Root Mean Square of Error Approximation), NFI (Normed Fit Index), CFI (Comparative Fit Index), and Chisq/df (relative/normed chi-square).

Table 4.

Goodness of Fit Statistics

Model-of-fitindices	Level of Acceptance	Literature	Teachers	Professionals	Recent graduates
GFI	> .90 or >.95	(Miles and Shevlin, 1998)	0,91	0,89	0,88
AGFI	≥ .90	(Hooper et al., 2008).	0,88	0,86	0,83
RMSEA	< .08	(MacCallum et al., 1996)	0,075	0,067	0,077
NFI	> .90	(Bentler and Bonnet, 1980)	0,87	0,83	0,78
CFI	≥.90	(Bentler, 1990)	0,84	0,81	0,74
Chisq/df	< 5.0	(Wheaton et al., 1977)	1,79	1,56	1,88

The findings reveal that all the values of fitness indices werewithin or close to the acceptable range and, therefore, satisfy the level of acceptance. In the category of absolute fit, the value of RMSEA is lower than 0.08 (Shevlin and Miles, 1998). The value

of GFI wasgreater than 0.90 for the teacher's measurement model and close to 0.90 for the other measurement models (professionals and graduates). In the category of incremental fit, the value of CFI and NFI werealso close to 0.90 (Bentler and Bonnet, 1980; Bentler, 1990). In the category of parsimonious fit, the value of chisq/dfwaslower than 5.0 (Wheaton et al., 1977). Thus, those indices give evidence for a good fit between the model and the observed data.

Convergent Validity and Construct Reliability Results of Measurement Models

Table 5 summarizes Convergent Validity (CV) and Construct Reliability (CR) results for the three models. Convergence validity, which refers to the degree of agreement between two or more indicators of the same latent variable (Campbell and Fiske, 1959), wasassessed, for the three models, based on the Average Variance Extracted (AVE).

As clearly shown in Table 5, the values of AVE for all constructs exceeded the cut-off value of 0.50 suggested by Hair et al. (2010), indicating, therefore, that of the measurement models are well measured and explained by its observed variables. In addition, all 32 items, assigned to the six factors, indicated acceptable factor loadings over 0.5 (Johnson et al. 2001; Awang, 2015). On the other hand, Jöreskog's rho was calculated to assess the construct reliability for the three models, the recommended level, which should be greater than 0.70 (Chin, 1998), wassatisfied since Jöreskog's rho coefficient for the six factors ranged from 0.83 through 0.93 as shown in Table 5.

Table 5.

Convergent Validity (CV) and Construct Reliability (CR) Statistics

		Teachers		**Professionals**		**Recent graduates**	
Latent Variables (Measurement Model)	**Items**	**CR**	**CV**	**CR**	**CV**	**CR**	**CV**
Intellectual skills	3	0,898	0,75	0,834	0,637	0,863	0,684
Technical and Functional skills	5	0,845	0,775	0,923	0,708	0,934	0,742
Personal skills	5	0,927	0,712	0,907	0,664	0,916	0,69
Interpersonal and Communication skills	7	0,967	0,829	0,962	0,781	0,944	0,709
Organizational skills	4	0,928	0,724	0,89	0,673	0,888	0,669
General Skills	8	0,942	0,672	0,938	0,658	0,93	0,629

Results of Hypotheses Testing and Discussion

Means and Weights Results of Professional Skills

Table 6 provides means and weights statistics regarding the six professional skills. This descriptive analysis allowed a better description of the extent of the contribution of the Tunisian accounting education in the development of skills laid down by IES3.

The results indicated that there wereno significant differences in means and weight between the three samples (Teachers, Professional accountants and student graduates). Moreover, according to the respondents of the three samples, the skills the most conveyed by the higher education institutions in Tunisia are personal skills with a mean score close to 4 out of 5. Next cameorganizational skills, general skills, technical and functional skills and intellectual skills. The second remarkable result wasthe low importance that higher education in Tunisia seemedto give to interpersonal and communication skills in the view of the respondents. In fact, the mean score wasless than 3 and close to 2 out of 5 for the three samples.

Table 6.

Means and Weights of Professional Skills

professional skills	Items	Teachers		Professionals		Recent graduates	
		Mean	Weight	Mean	Weight	Mean	Weight
Intellectual skills	3	3,5	70 %	3,5	70 %	3,51	70 %
Technical and Functional skills	5	3,76	75 %	3,8	76 %	3,76	75 %
Personal skills	5	3,85	77 %	3,88	77 %	3,82	76 %
Interpersonal and Communication skills	7	2,22	44 %	2,21	44 %	2,27	45 %
Organizational skills	4	3,82	76 %	3,86	77 %	3,79	76 %
General Skills	8	3,78	75 %	3,83	76 %	3,75	75 %

Structural Model Analysis: Test of Hypotheses

PLS-SEM was performed with Lisrel 8.8, using maximum likelihood estimates, to test the hypothesized models in assessing the extent to which the higher education of accounting currently applied in Tunisia allows accounting graduates to develop professional skills in compliance with IES 3. The assessment of the structural model implies that the individual path coefficients must be significant (Hair et al., 2011). The findings are displayed in Table 7, significant causal relationships at 0.05 level are given one asterisk (*). Onthe other hand, insignificant path coefficients are shown in bold. Within this context, the results indicated statistically significant coefficients at level 0.05 for H1, H5 and H6. However, the results didshow that H4 hadinsignificant coefficients for the three samples. Besides, the finding pointed out insignificant coefficients for H2 from the point of view of teachers and for H3 from the perspective of professional accountants.

Table 7.

PLS-Structural Model: Path Coefficient and t-statistics

Hypothesized relationships	Teachers		Professionals		Recent graduates	
	Coefficient	T-value	Coefficient	T-value	Coefficient	T-value
H1: TAEP** → Intellectual skills	0,78*	9,36	0,31*	2,44	0,39*	2,22
H2: TAEP → Technical and Functional skills	**0,18**	**1,03**	0,37*	3,87	0,73*	5,56
H3: TAE → Personal skills	0,52*	5,05	**0,21**	**1,15**	0,65*	3,14
H4: TAE → Interpersonal and Communication skills	**0,07**	**0,94**	**0,13**	**0,96**	**0,24**	**1,25**
H5: TAE → Organizational skills	0,64*	2,47	0,66*	5,11	0,69*	4,47
H6: TAE → General Skills	0,57*	6,85	0,59*	4,23	0,61*	6,07

* $p \leq 0.05$ (significant at 0.05 level),** TAEP: Tunisian Accounting Education Programs

Discussion, Conclusion and Recommendations

This paper has empirically evaluated the extent of professional skills compliance with IESs within thecontext of Tunisian accounting education. By reference to the IES 3 and prior research, a hypothesized model was developed by including 32 comprehensive indicators assigned to six skills constructs. The measurement model was empirically tested by SEM using data collected from 419 respondents, including university teachers, graduate students and professional accountants in Tunisia. The results provide sufficient evidence of the extent of compliance with IES 3 concerning the six following skills: intellectual skills, technical and functional skills, personal skills, interpersonal and communication skills, organizational skills and general skills.

As can be observed in Table7, the results show support for H1, the higher education of accounting currently applied in Tunisia allows accounting graduates to develop intellectual skills, by teachers, professional accountants and graduate students with coefficient values of 0.78 (T-value = 9.36), 0.31(T-value = 2.44) and 0.39 (T-value = 2.22), respectively ($p \leq 0.05$). Our results are consistent with the findingsreported by Awayiga et al. (2010) and AAA (1986). This result was expected because this type of skill is a critical basis skill for professional accountants given that it focuses on the critical and logical analysis and organization of data allowing the professional accountant to solve problems, make decisions, and exercise professional judgment. In addition, from the point of view of teachers, this skill is considered as the first and the most important professional skill provided by the accounting education program in Tunisia.

In connection with H2, the higher education of accounting currently applied in Tunisia allows accounting graduates to develop technical and functional skills; the results provide insights on divergent views about the ability of the accounting education program in Tunisia to develop this kind of skills. In fact, findings regarding professional accountants and graduate students provide robust support for H2 with significant coefficients values of 0.37 (T-value = 3.87) and 0.73 (T-value = 5.56), respectively at 0.05 level. However, results with reference to teachers indicate rejecting H2 with weak insignificant coefficient value of 0.18 (T-value = 1.03) at 0.05 level implying that accounting education programs in Tunisia do not contribute to the development of technical skills, a result which is consistent with Awayiga et al.'s (2010) findings who considers that this skill is of less importance and calls for an awareness of the need to integrate the practical aspect into the accounting education programs.

In respect of H3, the higher education programs of accounting, currently applied in Tunisia, allows accounting graduates to develop personal skills, the findings point out divergent viewpoints about the contribution of accounting education programs in Tunisia to develop this kind of skills. In this context, findings in relation to teachers and graduate students lend support to H3 with significant strong coefficients values of 0.52 (T-value = 5.05) and 0.65 (T-value = 3.14), respectively at 0.05 level. On the other hand, results concerning professional accountants indicate rejecting H3 with a moderate insignificant coefficient value of 0.21 (T-value = 1.15) at 0.05 level, a result which is in agreement with those reported by Awayiga et al. (2010) and Jackling and Lange (2009). Perception of professional accountants should be considered since they are considered as employers of the beneficiaries (graduate students) of the accounting programs applied by teachers, as upstream assessors, and, therefore, they are more pragmatic and objective, as downstream assessors, in the assessment of outputs of the accounting education programs for improvement purposes.

Moreover, the findings reveal rejection H4, the higher education programs of accounting currently applied in Tunisia allows accounting graduates to develop interpersonal and communication skills, by teachers, professional accountants and graduate students with almost weak insignificant coefficient values of 0.07 (T-value = 0.94), 0.13 (T-value = 0.96) and 0.24 (T-value = 1.25), respectively at 0.05 level, results consistent with those reported by AECC (1990) and Jackling and Lange (2009). Hence, this evidence allows us to conclude that the accounting education programs in Tunisia are not sufficiently developed in this interactive aspect or in compliance with the IES3. In this regard, it is noted that this gab in the Tunisian accounting education was not only raised by teachers and professional accountants, but graduate students are also aware of the weakness of the accounting education program they have pursued to develop their interpersonal and communication skills.

As for H5, the higher education programs of accounting, currently applied in Tunisia, allows accounting graduates to develop organizational and business management skills, the results indicate statistically significant strong coefficients values of 0.64 (T-value = 2.47), 0.66 (T-value = 5.11) and 0.69 (T-value = 4.47) concerning teachers, professional accountants and graduate students, respectively, so that H5 cannot be supported. These findings are consistent with those of Lin (2008)

and Hancock et al. (2009). On the contrary, these results were invalidated by Jackling and Lange (2009), who highlighted that the accounting education program did not develop managerial skills.

Finally, the results validate H6, the higher education of accounting, currently applied in Tunisia, allows accounting graduates to develop general skills, as statistically significant strong coefficients were found at 0.05 level for teachers, professional accountants and graduate students with values of 0.57 (T-value = 6.85), 0.59 (T-value = 4.23) and 0.61 (T-value = 6.07), respectively. These findings are supported by those reported by Lin (2008), and, in contrast, they contradict with those of Jackling and Lange (2009).

To conclude, these findings provide strong empirical evidence that teachers, professional accountants and graduate students unanimously agree that the accounting education program in Tunisia, as a tool for developing professional skills, allow only the development of intellectual (H1), organizational (H5) and general skills (H6). In contrast, Interpersonal and Communication skills are considered as the weak link of the accounting education program in Tunisia with the agreement of all respondents. In addition, divergent views were noted regarding the ability of the Tunisian accounting education program to develop technical and functional skills and personal skills. On the one hand, teachers, contrary to the view of professional accountants and graduate students, do notlend support that the higher education institutions in Tunisia convey technical and functional skills in compliance with IES3, on the other hand, professional accountants, against the opinion of teachers and graduate students, declared that accounting education program in Tunisia did not contribute to the development of personal skills.

Our paper contributes significantly to fill in the gap in the International Accounting Education Standards research in the context of the Middle East and North Africa (MENA) by offering new empirical evidence that the accounting education program in Tunisia allows the development of intellectual, organizational and general skillssignificantly. However, our research suggests that interpersonal and communication skills are considered as the weak link of the accounting education program in Tunisia with the agreement of all respondents. Additionally, divergent views were noted regarding the ability of the Tunisian accounting education program to develop technical and functional skills and personal skills. Furthermore, Our study providesa methodological contribution to the International Accounting Education Standards research using the PLS-SEM approach, as the data analysis techniquesince it remains underused in the investigation of latent phenomena in the field of Accounting research (do Nascimento& da Silva Macedo, 2016).

The findings obtained inthis study have many significant implications. First, this studyprovides evidence to the accounting academics in different universities with a view to improving employability skills in their academic programs and to help students to develop internationally recognized professional skills. Second, our findings are also of interest to the employers who are interested to see evidence of reducing the gap between the professional skills developed at the universities and

those required by potential employers and prospective accounting service providers in particular. Third, we provide very important practical implications as our findings also draw the attention of the target government authorities to revisit their accounting education curriculum to bring it into line with IAESs to meet the needs of the accounting service providers locally and internationally. Fourth, our finding carries implications for the target IFAC member bodies in the interest of a comprehensive understanding of the reality of professional skills compliance with IAESs from different contexts topromote convergence of the international standardized professional skills framework in the accounting education around the world and, therefore, providing competent professional accountants needed by different economic stakeholders in the economic environment.

Our study acknowledges many limitations that need to be considered in analyzing the findings. First, due to the small sample size, we cannot generalize the outcomes to a wider population. Another limitation of this study is that the use of a convenience sampling procedure may cause the problem of sampling biases and affect the consistency of the results. Additionally, this study did not undertake a comparative analysis ofTunisian and overseas students. Forth, the present paper did not consider the perception of the Big 4 accounting firms as a crucial stakeholder in the assessment of professional skills conveyed by universities and their level of compliance with IESs.

Finally, as our study has been conducted in Tunisia as a former French colony in North Africa and, therefore, with French academic cultures, it opens the doors to empirically examine the extent of professional skills compliance with IES3 in Anglo-Saxon cultures countries in the Middle East and North Africa (MENA) to permit one to compare the results from different cultures and contexts and provide valuable insights on the issue of IESs compliance.

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1	☒	*The manuscript is a report of original educational research or a discussion article on research topics in education.* Aday makale, eğitim alanıyla doğrudan ilgili bir araştırma ya da tartışma yazısıdır.
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