Kaya, T., Koca, M. K. & Kaya, M. T. (2023). Investıgatıon Of Socıal Studıes Teacher Candıdates' Epıstemologıcal Belıefs, *International Journal of Eurasia Social Sciences (IJOESS)*, 14(53), 1015-1028.

DOI: http://dx.doi.org/10.35826/ijoess.3352

ISSN: 2146-1961 ***Makale Türü (ArticleType):*** Research Article

INVESTIGATION OF SOCIAL STUDIES TEACHER CANDIDATES' EPISTEMOLOGICAL BELIEFS[1]

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Gönderim tarihi: 19.04.2023 *Kabul tarihi: 18.08.2023* *Yayım tarihi: 01.09.2023*

ABSTRACT

The aim of this research is to examine the epistemological beliefs of social studies teacher candidates. The research was carried out in accordance with the scanning model. The study group of the research consists of 226 social studies teacher candidates studying at Afyon Kocatepe University Faculty of Education in the 2020-2021 academic year. While determining the study group, the convenient sampling method, which is one of the non-random sampling methods, was used. In the study, the "Epistemological Beliefs scale" was used as a data collection tool. The scale is in 5-point Likert type, consists of 3 subdimensions and 23 items. The obtained data were analyzed with the statistical package program. Normality assumptions were tested in order to reveal the structural features of the obtained data group. Skewness and kurtosis values were examined in all sub-dimensions of the epistemological beliefs scale. Accordingly, it was concluded that the study showed a normal distribution and that the analyzes to be made would be done with parametric tests. In the data analysis process, t-test and one-way analysis of variance (ANOVA) were used for groups independent of descriptive statistics. As a result of the study, it was determined that pre-service teachers' epistemological beliefs were high. It was observed that there was no significant difference in the epistemological beliefs of social studies teacher candidates in terms of gender, grade level, school success score and tendency to graduate education. Suggestions were made according to the results obtained. Accordingly, it is recommended to conduct studies with different branches and teachers.

Keywords: Epistemological belief, social studies, pre-service teacher.

[1] This study was produced from the first author's master's thesis.

INTRODUCTION

Today, in the constructivist approach-based teaching programs, the individuality of the students is emphasized. The lives of individuals play an important role in the formation of these characteristics. For this reason, each individual's learning process and knowledge formation differ. In the process of acquiring information, some of the information provided to them in schools can become outdated and change in a short time. For this reason, schools now aim to teach individuals how to access and use information, as well as providing information. In other words, teachers are expected to be people who make it easier for students to access up-to-date sources of information, question information, and acquire information. It can be said that this process is closely related to the epistemological beliefs of both students and teachers (Kanadlı & Akay, 2019).

Schommer (1994) states that epistemological beliefs consist of five titles and individuals exhibit the development of these beliefs together. These beliefs can be listed as: source of knowledge, absoluteness/certainty of knowledge, organization of knowledge, control of learning and speed of learning. It can be said that having these beliefs is very important in terms of source of information, accessing information, organizing information, controlling learning speed and process. Considering the fact that these beliefs are effective in all aspects of knowledge today, it would be correct to say that epistemological beliefs have a great impact not only in accessing information, but also in the processes of using and processing information effectively (Kanadlı & Akay, 2019). When the national and international literature is examined, it is seen that researchers mostly rely on Schommer's studies in the reflections of the epistemological belief concept on education (Bahçıvan, 2015; Borgerding, Deniz, & Anderson, 2017; Cantwell, Bourke, Scevak, Holbrook, & Budd, 2017; İlhan, Demir & Aslan, 2013; Madjar, Weinstock, & Kaplan, 2017; Pope & Mooney, 2016; Sadiç & Pine, 2015). According to Schommer (1994), epistemological beliefs are individuals' beliefs about the source, certainty and structure of knowledge, and the speed and control of learning. These beliefs, based on the nature of knowledge and learning, manifest themselves in almost all phases of individuals' lives. In general, epistemological beliefs are accepted as beliefs about the nature of knowledge and the acquisition of knowledge, according to Schommer and Duell (2013). Chan and Elliott (2000) define epistemological beliefs as beliefs about the nature of knowledge and learning, and they say that teachers' epistemological beliefs have an impact on determining teaching methods and teaching.

Studies have shown that epistemological beliefs are not an innate and unchangeable personal characteristic through genetic means, on the contrary, they have a structure that changes, renews, and can be developed over time and are acquired later. Therefore, it can be said that epistemological beliefs are affected by various factors (mental development, gender, age, class level, place of residence and culture). (Deryakulu, 2017; Eroğlu and Güven, 2006; Schommer-Aikins, 2004; Tezci and Uysal, 2004;). Considering that epistemological beliefs are an individual feature that varies from person to person and that learning is related to individual characteristics, it has been revealed by studies that epistemological beliefs directly or indirectly affect learning (Yılmaz, 2007). The knowledge, environment, lifestyle, social and cultural environment and personality traits of both teachers and students affect their epistemological beliefs. In addition, students' epistemological beliefs affect their

interpretation of information and the type and level of cognitive learning strategies they prefer. Thus, epistemological beliefs take their place in the teaching process as a concept that both affects and is affected (Demir & Akınoğlu, 2010).

Teachers' perspectives can affect the success of the education program they apply, their classroom practices, the strategies, methods and techniques they use (Aslan, 2017). In this case, it inevitably has some effects on the education process of the students. Therefore, it is very important to identify teacher beliefs and develop these beliefs positively (Deryakulu, 2017). One of the most appropriate places to do this is in the training processes of teacher candidates. Pajares (1992) states that it is very difficult to achieve a positive change without addressing teachers' epistemological beliefs through education programs during their education. From this point of view, all perceptions of the individual about the nature of knowledge, learning and teaching are influenced and shaped by teachers and the education system (Cheng, Chan, Tang, & Cheng, 2009). Belenky, Clinchy, Goldberger, and Tarule (1986) state that university education should be effective in bringing about positive changes in individuals' epistemological beliefs. As a result of this situation, with the training of teachers who have advanced epistemological perspectives, students will have the chance to receive education by using various and effective teaching methods in the education and training process, creating a positive classroom atmosphere in all respects (Hashweh, 1996). On the other hand, these teachers will positively affect their students in developing critical thinking, questioning and higher-level thinking skills (Maor & Taylor, 1995). From this point of view, it is very important to obtain information about prospective teachers, who are the teachers of the future, in order to guide the steps to be taken. The aim of this study is to investigate the epistemological beliefs of teacher candidates.

The aim of the study is to determine the epistemological beliefs of social studies teacher candidates. For this purpose, answers to the following questions were sought:

1. What are the epistemological beliefs of teacher candidates?
2. Do pre-service teachers' epistemological beliefs differ according to the gender variable?
3. Do pre-service teachers' epistemological beliefs differ according to the grade level variable?
4. Do pre-service teachers' epistemological beliefs differ according to the variable of school success grade?
5. Do pre-service teachers' epistemological beliefs differ according to the variable of their tendency to do postgraduate education?

METHOD

Research Model

Since the epistemological beliefs of social studies teacher candidates will be examined in the research, it was carried out in accordance with the scanning model, which is one of the quantitative research methods. Scanning research is based on the opinions of the participants about a subject or event, or their interests, skills, abilities, attitudes, etc. These are studies that aim to determine the characteristics of the situation and make a

description by taking a picture of the existing situation (Büyüköztürk et al., 2016; Cohen et al., 2000; Karasar, 2016).

Study Group

The study group of the research consists of 226 social studies teacher candidates studying at Afyon Kocatepe University Faculty of Education in the 2020-2021 academic year. While determining the study group, the convenient sampling method, which is one of the non-random sampling methods, was used. Economy is essential in convenient sampling method. This type of sampling allows the researcher to take samples from his familiar environment (Balcı, 2001).

The results of the descriptive analyzes regarding the variables of gender, grade level, school achievement score and tendency to graduate education of social studies teacher candidates in the study group of the research are presented in the tables below.

Table 1. Frequency and Percentage Values Regarding Gender of Social Studies Teacher Candidates

Groups	*f*	%
Women	141	62,4
Men	85	37,6
Total	226	100

According to Table 1, 141 (62.4%) of the social studies teacher candidates participating in the study were female and 85 (37.6%) were male.

Table 2. Frequency and Percentage Values of Social Studies Teacher Candidates Regarding Grade Level

Groups		*f*	%
1.	**Grade**	65	28,8
2.	**Grade**	40	17,7
3.	**Grade**	65	28,8
4.	**Grade**	56	24,8
Total		226	100

According to Table 2, 65 (28.8%) of the social studies teacher candidates participating in the study were in the first grade, 40 (17.7%) were in the second grade, 65 (28.8%) were in the third grade, and 56 (24.8%) are attending the fourth grade.

Table 3. Frequency and Percentage Values of Social Studies Teacher Candidates Regarding School Achievement Scores

Groups	*f*	%
2.00 and below	35	15,5
2.01 – 3.00	138	61,1
3.01 and above	53	23,5
Total	226	100

According to Table 3, the frequencies and percentages related to the school success scores of the social studies teacher candidates participating in the study were calculated. 35 (15.5%) pre-service teachers have a grade point average of 2.00 and below, 138 (61.1%) pre-service teachers have a grade point average between 2.01 and 3.00, 53 (23.5%) pre-service teachers have a grade point average of 3.01 and above.

Table 4. Frequency and Percentage Values of Social Studies Teacher Candidates' Tendency to Do Postgraduate Education

Groups	*f*	%
Yes	126	55,8
No	100	44,3
Total	226	100

According to Table 4, when the frequencies of the tendencies of the social studies teacher candidates participating in the research to do postgraduate education are examined, 126 (55.8%) pre-service teachers, that is, more than half of the pre-service teachers, want to do postgraduate education. 100 (44.3%) pre-service teachers do not want to do postgraduate education.

Data Collection Tool

The original Epistemological Beliefs scale was developed by Schommer (1990). The scale was adapted from English to Turkish by Deryakulu and Büyüköztürk (2002), and its validity and reliability study was conducted again by Aydın, Selçuk, Çakmak, and İlğan (2017). The Turkish version of the scale consists of three sub-dimensions. These sub-dimensions are that success depends on effort, success depends on talent, and belief in the existence of a single truth. The Cronbach's alpha coefficient for the effort subscale was .88, it was .88 for the ability subscale, and .85 for a single correct subscale. As a result of all analyzes, it was concluded that the scale is valid and reliable in three-dimensional structure. The scale consists of 23 items in 5-point Likert type.

The cronbach alpha reliability coefficient in the Epistemological Beliefs Scale of social studies teacher candidates was calculated as .64. If the Cronbach Alpha reliability coefficient is between $.60 \leq a \leq .90$, the scale is quite reliable (Tavşancıl, 2006). It is possible to say that this scale applied to teacher candidates is reliable.

Data Collection and Analysis

Data collection tools were determined by scanning the literature in accordance with the purpose of the research. The data were collected on a voluntary basis from the pre-service teachers with the predetermined data collection tools. The data were collected in the 2020-2021 academic year.

The data obtained from the social studies teacher candidates in the study group were entered into the statistics program. Before the analysis process started, the Cronbach Alpha values of the data obtained from the scales applied in the research were examined, and since the obtained values were greater than .60, it was determined that the measurement was reliable. Demographic variables in the personal information form are grouped. Frequency and percentage values for demographic characteristics were calculated. Arithmetic mean,

mode, median, standard deviation, minimum and maximum values, which are the descriptive statistics of the data obtained through the scales, were revealed. Normality assumptions made in order to reveal the structural features of the obtained data group were tested. The findings of the normality analysis are given in Table 5.

Table 5. Kurtosis and Skewness Values of the Sub-Dimensions of the Epistemological Beliefs Scale

	Skewness	Kurtosis
Effort Sub-Dimension	-.169	.674
Ability Sub-Dimension	-.113	1.384
Single True Sub-Dimension	-.478	.417

According to Table 5, skewness and kurtosis values in all sub-dimensions of the epistemological beliefs scale were found to be between -1,500 and +1,500 (Tabachnick & Fidell, 2013). Accordingly, it was concluded that the study showed a normal distribution and that the analyzes to be made would be done with parametric tests.

The scores of the scale dimensions are evaluated between 1 and 5. In order to calculate the distribution range, the formula Distribution range=Maximum value-Least value/Number of degrees was used. The scores of the Social Studies teacher candidates from the Epistemological Beliefs and Lifelong Learning Scales are as follows: 1.00-1.80 lowest, 1.81-2.61 low, 2.62-3.41 medium, 3.42-4.21 high, 4.22-5.00 highest (Sümbüloğlu, 1993).

The significance level was accepted as .05 in order to determine the level of differentiation in the difference analyzes performed. Independent groups t-test was used to examine the significant difference in the scores of Social Studies Teacher Candidates from the Epistemological Beliefs Scale according to gender and postgraduate education, and one-way analysis of variance (One Way ANOVA) was used to determine the significant difference according to grade level and school achievement score. In order to determine from which groups the significant differentiation emerged as a result of one-way analysis of variance, the Levene homogeneity test was performed and it was determined with the LSD test from post-hoc analysis.

FINDINGS

Descriptive statistics to determine the epistemological beliefs of pre-service teachers are given in Table 6.

Table 6. Descriptive Statistics on the Levels of Social Studies Teacher Candidates' Scores from the Epistemological Beliefs Scale

	N	$\overline{X}$	Sd	Min. Value	Max. Value	Level
Effort Sub-Dimension	226	3.593	.449	2.00	5.00	High
Ability Sub-Dimension	226	3.706	.425	1.88	5.00	High
SingleTrue Sub-Dimension	226	3.697	.634	1.60	5.00	High
Epistemological Beliefs Scale	226	3.655	.330	2.30	4.48	High

When Table 6 is examined, the scores of social studies teacher candidates' epistemological beliefs were calculated. In line with these findings, the average of the epistemological belief scores of the social studies teacher candidates participating in the research (= 3.655) was “high”, when the sub-dimensions were examined, the average score of the effort sub-dimension (= 3.593), the average score of the talent sub-

dimension (= 3.706) and the score of a single true sub-dimension mean (= 3.697) was found to be at a “high” level.

The findings obtained from the t-test analysis conducted to examine the differentiation of pre-service teachers' epistemological belief scores according to the gender variable are given in Table 7.

Table 7. Results of the T-Test Analysis of Pre-service Teachers' Epistemological Beliefs by Gender Variable

	Gender	N	$\bar{X}$	Sd	df	t	p
Effort Sub-dimension	Women	141	3.601	.442	224	.347	.729
	Men	85	3.580	.462			
Ability Sub-Dimension	Women	141	3.698	.424	224	-.366	.715
	Men	85	3.719	.429			
Single True Sub-Dimension	Women	141	3.695	.630	224	-.070	.944
	Men	85	3.701	.646			
Epistemological Beliefs Scale	Women	141	3.665	.328	224	.012	.991
	Men	85	3.655	.365			

In Table 7, the t-test analysis for the epistemological beliefs of pre-service teachers was performed. As a result of the analysis no significant difference was detected in the overall epistemological beliefs scale by gender [t(224) = .012; p>.05], in the effort sub-dimension [t(224) = .347; p>.05], [t(224) = -.336; p>.05] and a single true subdimension [t(224) = -.070; p>.05]

The findings obtained from the One Way ANOVA analysis conducted to examine the differentiation status of the epistemological belief scores of teacher candidates according to the grade level variable are given in Table 8.

Table 8. Results of One Way ANOVA Analysis of Pre-Service Teachers' Epistemological Beliefs According to Grade Level Variable

Dimensions	Source of Variance	Sum of Squares	df	Mean of Squares	F	p	Source of Difference
Effort Sub-dimeinsion	Inter Groups	1.530	3	.510	2.585	.054	-
	In-Groups	43.790	222	.197			
	Total	45.320	225				
Ability Sub-dimension	Inter Groups	.314	3	.105	.577	.631	-
	In-Groups	40.368	222	.182			
	Total	40.683	225				
Single True Sub-Dimension	Inter Groups	5.036	3	1.679	4.356	.005	A<B A<C A<D
	In-Groups	85.543	222	.385			
	Total	90.578	225				
Epistemological Beliefs Scale	Inter Groups	.815	3	.272	2.545	.057	-
	In-Groups	23.699	222	.107			
	Total	24.514	225				

A: 1, B: 2, C: 3, D: 4

Looking at Table 8, it was seen that there was no significant difference between the arithmetic mean of the groups as a result of the one-way analysis of variance (ANOVA) conducted to examine the differentiation of the

mean scores of social studies teacher candidates' epistemological beliefs according to the grade level variable [F (3 – 222) = 2.545; p>.05]. When the sub-dimensions of the Epistemological Beliefs Scale were examined according to the grade level variable, in the effort sub-dimension [F (3 – 222) = 2.585; p>.05] and [F (3 – 222) = .577; p>.05], it was determined that there was no significant difference. However, a significant difference was observed in a single line sub-dimension. LSD multiple comparison analysis, which is one of the complementary analyzes, was performed to determine which groups caused the significant difference between the groups. As a result of the LSD multiple comparison analysis a significant difference was found between first grades (= 3.480) and second grades (= 3.870) in favor of second graders, between first grades and third grades (= 3.708) in favor of third graders, between first grades and fourth grades (= 3.814) in favor of fourth graders [F (3 – 222) = 4.356; p<.05].

The findings obtained from the One Way ANOVA analysis, which was conducted to examine the differentiation of pre-service teachers' epistemological belief scores according to the school achievement score variable, are given in Table 9.

Table 9. Results of One Way ANOVA Analysis of Pre-service Teachers' Epistemological Beliefs According to the Variable of School Achievement Score

Dimensions	Source of Variance	Sum of Squares	df	Mean of Squares	F	p	Source of Difference
Effort Sub-Dimension	Inter-Groups	.185	2	.092	.457	.634	-
	In-Groups	45.135	223	.202			
	Total	45.320	225				
Ability Sub-Dimension	Inter-Groups	1.257	2	.629	3.556	.030	A>B
	In-Groups	39.425	223	.177			
	Total	40.683	225				
Single True Sub-Dimension	Inter-Groups	.744	2	.372	.923	.399	-
	In-Groups	89.835	223	.403			
	Total	90.578	225				
Epistemological Beliefs Scale	Inter-Groups	.601	2	.300	2.776	.064	-
	In-Groups	24.134	223	.108			
	Total	24.735	225				

A: 2.00 and below, B: 2.01-3.00, C: 3.01 and above

When Table 9 is examined, it was found that there was no significant difference between the arithmetic mean of the groups as a result of the one-way analysis of variance (ANOVA), which was conducted to examine the differentiation of the mean scores of the epistemological beliefs of the social studies teacher candidates according to the school achievement score variable [F (2 – 223) = 2.776; p>.05]. When the sub-dimensions of the Epistemological Beliefs Scale were examined according to the school achievement score variable it was determined that there was no significant difference between the effort sub-dimension [F (2 – 223) = .457; p>.05] and a single line sub-dimension [F (2 – 223) = .923; p>.05]. When the ability sub-dimension was examined, it was seen that there was a significant difference. LSD multiple comparison analysis, which is one of the complementary analyzes, was performed to determine which groups caused the significant difference between the groups. As a result of the LSD multiple comparison analysis; It was found that there is a significant relationship between the teacher candidates with a school average of 2.00 and below ($\bar{X}$ = 3.868) and the

teacher candidates with a school average of 2.01-3.00 ($\bar{X}$ = 3.658) in favor of the teacher candidates with a school average of 2.00 and below [F (2 – 223) = 3,556; p<.05].

The findings obtained from the independent groups t-test analysis conducted to examine the differentiation of pre-service teachers' epistemological belief scores according to the variable of their tendency to graduate education are given in Table 10.

Table 10. The Results of the t-Test Analysis of Pre-service Teachers' Epistemological Beliefs According to the Variable of Tendency to Graduate Education

Dimensions	Tendency	N	$\bar{X}$	Sd	df	t	p
Effort Sub-Dimension	Yes	119	3.566	.486	213	-.871	.385
	No	96	3.621	.414			
Ability Sub-Dimension	Yes	119	3.704	.429	213	-.033	.974
	No	96	3.706	.431			
Single True Sub-Dimension	Yes	119	3.644	.682	213	-1.246	.214
	No	96	3.752	.569			
Epistemological Beliefs Scale	Yes	119	3.631	.351	213	-1.041	.299
	No	96	3.679	.315			

In Table 10, the t-test analysis of the pre-service teachers' epistemological beliefs was performed. As a result of the analysis, it was determined that there was no significant relationship in the epistemological beliefs scale according to the variable of tendency to graduate education [t (213) = -1.041 p>.05]. In addition, when the sub-dimensions were analyzed one by one,it was not found to be a significant relationship in the effort sub-dimension [t (213) = -.871; p>.05], ability sub-dimension [t (213) = -.033; p>.05] and a single true subdimension [t (213) = -1.246; p>.05]

CONCLUSION AND DISCUSSION

The scores of social studies teacher candidates' epistemological beliefs were calculated. In line with these findings, it was seen that the average of the epistemological belief scores of the social studies teacher candidates participating in the research (= 3.655) was “high”. When the sub-dimensions were examined, it was seen that the average score of the effort sub-dimension (= 3.593), the average score of the ability sub-dimension (= 3.706) and the mean score of a single correct sub-dimension (= 3.697) were high. This result; Kaya (2018), Karabulut and Ulucan (2012) show parallelism with the studies done by Akince (2020). In the study conducted by Kaya (2018) with teachers, it was concluded that teachers' scientific epistemological beliefs were at a high level. The study by Karabulut and Ulucan (2012) shows that physical education teacher candidates have a strong belief in the traditional understanding of science. In the study conducted by Akince (2020), it was concluded that the epistemological belief levels of individuals are high.

No significant difference was found in the general epistemological beliefs scale, effort sub-dimension, ability sub-dimension and a single truth sub-dimension of social studies teacher candidates according to gender. This shows that the gender variable does not have a significant effect on epistemological beliefs. This result is in

parallel with the studies conducted by Öner (2019), Tümkaya 2012, Ekici (2014), Yordamlı (2020), Kazu and Erten (2015), Ertugay (2019), Karaçam (2019) and Bakır and Adak (2014). In the study conducted by Kazu and Erten (2015) with pre-service teachers in different fields, it was concluded that there was no significant difference between epistemological belief dimensions in terms of gender variable. As a result of the study conducted by Yordamlı (2020), it was seen that there was no significant gender-related difference in the epistemological beliefs of the pre-service teachers participating in the research. In the study conducted by Karaçam (2019), it was observed that the epistemological beliefs of preschool teachers did not differ according to gender. Studies conducted with primary and secondary school students by Neber and Schommer-Aikins (2002), high school students by Schommer (1993) and university students by Enman and Lupart (2000) concluded that epistemological belief did not develop depending on gender.

It was observed that there was no significant difference between the arithmetic mean of the groups in general in the epistemological beliefs scale according to the grade level of the social studies teacher candidates. When the sub-dimensions of the Epistemological Beliefs Scale were examined according to the grade level variable, it was determined that there was no significant difference in the effort sub-dimension and the ability sub-dimension. However, a significant difference was observed in a single true sub-dimension. It was concluded that the significant difference between the groups was in favor of the second graders between the first and second grades, between the first grades and the third grades in favor of the third graders, and between the first grades and the fourth grades in favor of the fourth graders. Among the reasons for this are that verbal department students trust the authorities more and the questioning phenomenon does not develop much in these students. This result shows parallelism with the studies conducted by Meral and Çolak (2009), Kahraman, Gürkan and Özgün (2017), Deniz (2014), Yordamlı (2020) and Akkoyunlu, Erdem and Yılmaz (2008). In these studies, it has been revealed that class level has no effect on epistemological beliefs. This result makes us interpret that the learning process is far from revealing a meaningful difference. In the study conducted by Yordamlı (2020), it was observed that the epistemological beliefs of social studies teacher candidates did not differ significantly in the dimensions of learning depending on effort or ability, but there was a differentiation in a single truth dimension. Likewise, Akkoyunlu, Erdem, and Yılmaz (2008) found in their study that while there was no significant difference in the first and fourth grades in their belief that learning depends on effort and learning depends on ability, fourth graders have more sophisticated beliefs in the dimension of belief that there is only one truth. In the study conducted by Kahraman, Gürkan and Özgün (2017), it was concluded that the grade level did not have a significant effect on the scientific epistemological beliefs of teacher candidates. As a result of the study conducted by Meral and Çolak (2009), it was revealed that the scores obtained from the scientific epistemological beliefs scale did not show a significant difference according to the grade level variable.

It was concluded that there was no significant difference between the arithmetic mean of the groups in general in the epistemological beliefs scale according to the school success score of the social studies teacher candidates. When the sub-dimensions of the Epistemological Beliefs Scale were examined according to the

school achievement score variable, it was determined that there was no significant difference in the effort sub-dimension and a single truth sub-dimension. In the sub-dimension of talent, it was determined that there was a significant relationship between the teacher candidates with a school average of 2.00 and below and the teacher candidates with a school average of 2.01-3.00 in favor of the teacher candidates with a school average of 2.00 and below. This result is in parallel with the studies conducted by Akgün and Gülmez (2015), Kanadlı and Akay (2019), Barnard, Lan, Crooks, and Paton (2008). In the study conducted by Kanadlı and Akay (2019), no significant relationship was found between epistemological beliefs and academic achievements. Similarly, in the study conducted by Barnard, Lan, Crooks, and Paton (2008), no significant relationship was found between students' epistemological beliefs and academic achievement. Finally, as a result of the study conducted by Akgün and Gülmez (2015), it was concluded that there is no significant relationship between students' epistemological beliefs and their academic achievements.

As a result of the analysis on the epistemological beliefs of social studies teacher candidates, it has been determined that there was no significant relationship in the scale of epistemological beliefs according to the variable of tendency to graduate education. In addition, when the sub-dimensions were analyzed one by one, it was seen that there was no significant relationship in the effort sub-dimension, ability sub-dimension, and a single correct sub-dimension.

SUGGESTIONS

In line with the results obtained in the research, the following recommendations have been developed:

- Epistemological belief levels of students in all education levels and branches can be measured and education policies can be developed in this direction.
- The results obtained from the research can be examined in depth with qualitative studies.
- Studies can be carried out to determine the epistemological belief levels of teachers.
- By doing activities that will positively affect the epistemological beliefs of the students in the lessons, it can be ensured that the students become individuals with high epistemological beliefs from an early age.
- Studies can be conducted in different branches and in different provinces where epistemological belief levels are measured, and the results of these studies can be compared.

Ethıcs Text

In this article, journal writing rules, publication principles, research and publication ethics rules, journal ethics rules were followed. Responsibility for all kinds of violations related to the article belongs to the authors. The research was completed in accordance with the rules of publication ethics. Within the framework of the research carried out, ethical permission was obtained from Afyonkocatepe University Scientific Research and Publication Ethics Committee (Ethics Committee Decision dated 20.11.2020 and subject 2020/227).

Author's Contribution Statement: 1st author contributed 40%, 2nd author 40%, 3rd author 20%.

REFERENCES

Akgün, A. ve Gülmez, H. (2015). Lise öğrencilerinin epistemolojik inançlarının kimya dersi akademik başarısına etkisinin incelenmesi. *Elektronik Sosyal Bilimler Dergisi*, 14(54), 68-80.

Akince, E. K. (2020). *Kuşaklara göre bireylerin bilişim teknolojilerini kullanım amaçları ve epistemolojik inançları arasındaki ilişki.* Yayınlanmamış Yüksek Lisans Tezi, İstanbul Üniversitesi.

Akkoyunlu, B., Erdem, M., ve Yılmaz, A. (2008). Öğretmen adaylarının bilgi okuryazarlığı özyeterlik inançları ve epistemolojik inançları üzerine bir çalışma. *8th International Educational Technology Conference (IETC, 2008)*, Eskişehir, Türkiye.

Aslan, C. (2017). Öğretmen adaylarının epistemolojik inançlarının çeşitli değişkenler açısından incelenmesi. *Eurasian Journal of Educational Research, 67*, 37-50.

Aydın, S., Selçuk, G., Çakmak, A. ve İlğan, A. (2017) Epistemolojik inançlar ölçeği Türkçe formunun geçerlik ve güvenirlik çalışması, *Bartın Üniversitesi, Eğitim Fakültesi Dergisi, Cilt 6, Sayı 3, s. 1166 – 1188*

Bahçıvan, E. (2015). Lise öğrencilerinin konu odaklı epistemolojik inançlarının kuvvet ve hareket konusunda kavramsal anlamaya yönelik etkisinin incelenmesi: Bir yapısal eşitlik çalışması. *Kastamonu Eğitim Dergisi, 23*(3), 1107-1126.

Bakır, S., ve Adak, F. (2014). Fen bilgisi öğretmen adaylarının epistemolojik inançları. *Cumhuriyet International Journal of Education*, *3*(4), 24-36.

Balcı, A. (2001). *Sosyal bilimlerde araştırma. Yöntem, Teknik ve İlkeler.* Pegem A Yayınları.

Barnard, L., Lan, W. Y., Crooks, S. M. and Paton, V. O. (2008). The relationship between epistemological beliefs and self-regulated learning skills in the online course environment, *MERLOT Journal of Online Learning and Teaching*, 4(3), 261-266.

Belenky, M. F., Clinchy, B. M., Goldberger, N. R. and Tarule, J. M. (1986). *Women's ways of knowing: The development of self, voice, and mind* (Vol. 15). Basic books

Borgerding, L.A., Deniz H. & Anderson, E. S. (2017), Evolution acceptance and epistemological beliefs of college biology students. *Journal of Research in Science Teaching, 54*(4), 493-519.

Büyüköztürk, Ş., Kılıç Çakmak, E., Akgün, Ö. E., Karadeniz, Ş. Demirel, F. (2016). Bilimsel araştırma yöntemleri. Pegem A Yayıncılık.

Cantwell, R. H., Bourke, S. F., Scevak, J. J., Holbrook, A. P. ve Budd J. (2017). Doctoral candidates as learners: A study of individual differences in responses to learning and its management. *Studies in Higher Education, 42*(1), 47-64.

Chan, K.W. and Elliott, R.G. (2000). Explorotary study of epistemological beliefs of hong kong teacher education students: resolving conceptual and empirical issues. *Asia-Pacific Journal of Teacher Education, 28* (3), 225-234.

Cheng, M.H., Chan K.W., Tang, Y.F. and Cheng, Y.N. (2009). Pre-Service teacher education students' epistemological beliefs and their conceptions of teaching. *Teaching and Teacher Education, 25*, 319-327.

Cohen, L., Manion, L. and Morrison, K. (2000). *Research methods in education* [5 th edn] London: Routledge Falmer.

Demir, S. ve Akınoğlu, O. (2010). Epistemolojik inanışlar ve öğretme öğrenme süreçleri. M.*Ü. Atatürk Eğitim Fakültesi Eğitim Bilimleri Dergisi, 32*, 75-93.

Deniz, J. (2014). Müzik öğretmen adaylarının epistemolojik inançları. *Eğitimde Kuram ve Uygulama*, *10*(3), 667-683.

Deryakulu, D. (2017). *Epistemolojik inançlar içinde; eğitimde bireysel farklılıklar* (Ed: Y. Kuzgun ve D. Deryakulu), ss. 253-281. (4. Basım). Nobel Yayıncılık.

Ekiçi, M. (2014). *Sosyal bilgiler öğretmenlerinin epistemolojik inançları ile öğretim stilleri arasındaki ilişki*. Yayınlanmamış Yüksek Lisans Tezi, Anadolu Üniversitesi.

Enman, M., ve Lupart, J. (2000). Talented female students' re-sistance to science: An exploratory study of post-secondary achievement, motivation, persistence, and epistemological characteristics, *High Ability Studies*, 1(2), 161-178

Eroğlu, S. E. ve Güven, S. (2006). Üniversite öğrencilerinin epistemolojik inançlarının bazı değişkenler açısından incelenmesi. *Selçuk Üniversitesi Sosyal Bilimler Dergisi, 16*, 295-312.

Ertugay, T. G. (2019). *Okul öncesi öğretmen adaylarının epistemolojik inançları ile matematik öğretimi ve öğrenimine yönelik inançları arasındaki ilişkinin incelenmesi.* Yayınlanmamış Yüksek Lisans Tezi, Marmara Üniversitesi.

Hashweh, M.Z. (1996). Effects of science teachers' epistemological beliefs in teaching. *Journal of Research in Science Teaching, 33*(1), 47-63.

İlhan, M., Demir, S. ve Arslan, S. (2013). Öğretmen adaylarının bilgisayar destekli eğitime yönelik tutumları ile epistemolojik inançları arasındaki ilişkinin incelenmesi. *Eğitim Teknolojisi Kuram ve Uygulama, 3*(2), 1-21.

Kahraman, S., Gürkan, G. ve Özgün, B.B. (2017). Fen bilgisi̇ ve sınıf öğretmeni̇ adaylarının epistemolojik inançlarının incelenmesi. *The Journal of Academic Social Science Studies,* (63), 141-154.

Kanadlı, S., & Akay, C. (2019). Schommer'in epistemolojik inançlar modelinin cinsiyet ve akademik başarı açısından incelenmesi: Bir meta-analizi çalışması. *Eğitim ve Bilim*, *44*(198).

Karabulut, E. ve Ulucan, H. (2012). Beden eğitimi öğretmenliği adaylarının bilimsel epistemolojik inançlarının farklı değişkenler açısından incelenmesi. *Spor ve Performans Araştırmaları Dergisi*. 3(2), 39-44

Karaçam, N. T. (2019). *Kuzey Kıbrıs Türk Cumhuriyeti'nde bulunan okul öncesi öğretmenlerinin epistemolojik inançlarının incelenmesi*. Yayınlanmamış Yüksek Lisans Tezi, Doğu Akdeniz Üniversitesi.

Karasar, N. (2016). *Bilimsel araştırma yöntemleri.* Nobel Yayınları.

Kaya, K. (2018). *Öğretmenlerin bilimsel epistemolojik inançları ile yaşam boyu öğrenme yeterlikleri arasındaki ilişki*. Yayınlanmamış Yüksek Lisans Tezi, Van Yüzüncü Yıl Üniversitesi.

Kazu, İ. Y. ve Erten, P. (2015). Öğretmen adaylarının epistemolojik inançlarının incelenmesi. *Dicle Üniversitesi Ziya Gökalp Eğitim Fakültesi Dergisi*, 25, 57- 7

Madjar, N., Weinstock M. ve Kaplan A. (2017) Epistemic beliefs and achievement goal orientations: Relations between constructs versus personal profiles, *The Journal of Educational Research, 11*0(1), 32-49.

Maor, D. and Taylor, P.C. (1995). Teacher epistemology and scientific inquiry in computerized classroom environments. *Journal of Research Science Education, 32*(8), 839-854.

Meral, M., ve Çolak, E. (2009). Öğretmen adaylarının bilimsel epistemolojik inançlarının incelenmesi. *Ondokuz Mayıs Üniversitesi Eğitim Fakültesi Dergisi*, (27), 129-146.

Neber, H., and Schommer-Aikins, M. (2002). Self-regulated science learning with highly gifted students: The role of cognitive, motivational, epistemological and environmental variables. *High Ability Studies*, 13(1), 59-74.

Öner, U. (2019). *İngilizce öğretmenlerinin epistemolojik inançları ile öğretme stilleri arasındaki ilişkinin incelenmesi. (izmir örneklemi)*. Yayınlanmamış Yüksek Lisans Tezi, Afyon Kocatepe Üniversitesi.

Pajares, M. F. (1992). Teachers' beliefs and educational research: cleaning up a messay construct. *Review of Educational Research, 62*(3), 307-332.

Pope, K. J. ve Mooney G. A. (2016). The related effects of item characteristics in measures of epistemological beliefs. *Africa Education Review, 13*(2), 1-16.

Sadıç, A. ve Çam, A. (2015). 8. sınıf öğrencilerinin epistemolojik inançları ile PISA başarıları ve fen ve teknoloji okuryazarlığı. *Bilgisayar ve Eğitim Araştırmaları Dergisi, 3*(5), 18-49.

Schommer, M. (1993). Epistemological development and academic performance among secondary students. *Journal of Educational Psychology*, 85(3), 406-411.

Schommer, M. (1994). Synthesizing epistemological belief research: tentative understandings and provocative confusions. *Educational Psychology Review, 6*(4), 293-319.

Schommer, M. ve Duell, O. K. (2013). Domain specific and general epistemological beliefs. Their effects on mathematics. *Revista de Investigación Educativa, 31*(2), 317-330.

Schommer-Aikins, M. (2004). Explaining the epistemological beliefs system: ıntroducing the embedded systematic model and coordinated research approach. *Educational Psychologist, 39*(1), 19-29.

Sümbüloğlu, K. (1993). *Biyoistatistik*. Özdemir Yayıncılık.

Tabachnick, B. G., and Fidell, L. S. (2013). *Using multivariate statistics* (6. b.). Pearson.

Tavşancıl, E. (2006). *Tutumların ölçülmesi ve SPSS ile veri analizi.* Nobel Yayın Dağıtım.

Tezci, E. ve Uysal, A. (2004). Eğitim teknolojisinin gelişimine epistemolojik yaklaşımların etkisi. *The Turkish Online Journal of Educational Technology, 3*(2), 158-164.

Tümkaya, S. (2012). Üniversite öğrencilerinin epistemolojik inançlarının cinsiyet, sınıf, eğitim alanı, akademik başarı ve öğrenme stillerine göre incelenmesi, *Kuram ve Uygulamada Eğitim Bilimleri*, 12 (1), 75-95.

Yılmaz, K. (2007). *Öğrencilerin epistemolojik ve matematik problemi çözümlerine yönelik inançlarının problem çözme sürecine etkisinin araştırılması*. (Yayımlanmamış Yüksek Lisans Tezi) Marmara Üniversitesi Eğitim Bilimleri Enstitüsü.

Yordamlı, D. (2020). *Sosyal bilgiler öğretmen adaylarının epistemolojik inançları ve bilgi okuryazarlık düzeyleri arasındaki ilişki*. Yayınlanmamış Yüksek Lisans Tezi, Bursa Uludağ Üniversitesi.