



Examining Epistemological Beliefs of Teacher Candidates According to Various Variables

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ABSTRACT

Purpose: Epistemological beliefs of teachers are important factors on their perceptions of subject area and their classroom practices. This research aims to define epistemological beliefs of teacher candidates and investigates whether or not epistemological beliefs change according to teacher candidates' gender, fields of study, year of study, and academic success. **Research Methods:** This is a descriptive study that tries to find a relationship between teacher candidates' epistemological beliefs and their academic success, gender, department, and year of study. Schommer's Epistemological Beliefs

Questionnaire (EBQ) was applied to 564 teacher candidates from a public university. The Independent Sample t-test was applied to determine the relationship between epistemological beliefs with gender and grade level. In order to define if teacher candidates' epistemological beliefs change depending on the registered program, a One-Way ANOVA for Independent Sample was used. Pearson correlation coefficients were calculated to determine the relation between epistemological beliefs and success. **Findings:** The results showed differences between female and male teacher candidates in all three factors of the epistemological beliefs questionnaire. Significant correlation was found between two factors of epistemological beliefs (belief that learning depends on effort and belief that learning depends on talent) and academic success at .01 levels. **Implications for Research and Practice:** The descriptive analysis of the present study showed that teacher candidates' epistemological beliefs change according to gender, field of study, and year of study, and is correlated with academic success. There is a need for experimental studies on how the epistemological beliefs of teachers reflect in classroom practices.

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Introduction

The epistemological beliefs of teachers are important factors in their perceptions of subject area and their classroom practices. Therefore, teachers' epistemological beliefs are an important variable in their teaching-learning process. Naive epistemological belief refers to a belief in certain and concrete knowledge and constant learning ability. In contrast, sophisticated epistemological belief refers to a belief in questionable knowledge, which could be improved by the learner. According to Akyildiz (1989), teacher effectiveness is strongly associated with teacher questioning, guidance, and responses to student questions during the teaching-learning process. In this framework, defining the epistemological beliefs of teachers is an important factor for constructing effective teaching-learning processes and improving teaching.

In the literature there are various definitions of epistemological beliefs and the term "epistemology" comes from the Greek word "epistémé". Epistémé refers to correct, scientific, and necessary knowledge in Ancient Greek philosophy (Topdemir, 2008). Simply, it has a meaning that consists of the philosophy of knowledge or how we understand and know knowledge. Epistemological beliefs, which result from the cognitive evaluation of an individual, shape his/her attitude toward knowledge. According to Perry (1981), epistemological beliefs are those that the individual has on what knowledge is, how it is acquired, and what criteria determine knowledge.

Studies on epistemological beliefs started in the last quarter of the 20th century. Perry's 1970 study on the meaning of educational experiences constructed the epistemological development theory (Hofer & Pintrich, 1997). Since Perry's first study there have been six types of studies in the literature:

1. Studies on improving Perry's developmental scheme.
2. Studies on developing simpler instruments to assess epistemological development.
3. Studies on gender differences in knowing/acquiring knowledge.
4. Studies on the effects of epistemological awareness on thinking and reasoning processes.
5. Studies on finding sub-dimensions of epistemological beliefs.
6. Studies on relationships between epistemological beliefs with other cognitive and motivational processes.

Posner, Strike, Hewson, and Gertzog (1982) claimed that epistemological willingness is the underlying factor of knowledge acquisition. In that manner, it would be hard to change epistemological beliefs as main belief. Recent studies in this field indicate that students' epistemological beliefs influence their motivation, consciousness, and academic performance (Bruning, Schraw, & Ronnig 1995; Hofer & Pintrich, 1997).

There are many studies on defining epistemological beliefs. The results of Belenky et al.'s (1986) studies with 135 women showed that epistemological beliefs

are developed in five steps: silence, received knowing, subjective knowing, procedural knowing, and constructed knowing. In the silence phase, individuals believe that knowledge is concrete and categorical and can be transferred by authorities. In the phase of received knowing, one can be a passive receiver of knowledge. In this phase individuals do not rely on their own abilities and want to ask questions of their authorities. In the third phase, subjective knowing, knowledge is subjective and one relies less on authorities' knowledge. In the procedural knowing phase, individuals consciously use systematic thinking processes instead of just relying on content. By using this process people give meaning to world, and here content is different than something that must be remembered. In the final phase, constructed knowing, procedural knowing and subjective knowing are integrated. People in this phase can more easily manage uncertain situations and realize that knowledge changes continuously.

Magolda (1994) underlined different phases for the development of epistemological beliefs and developed an instrument named the "Measure of Epistemological Reflections", with asking open-ended questions to 100 high school students during seven years (as cited in Brownlee, 2003). According to Magolda's epistemological classification, beliefs about knowing can be grouped into four dimensions: concrete (refer to received knowing), transitional (refer to subjective knowing), independent (refer to procedural knowing), and contextual (refer to constructed knowing). Magolda also studied the gender differences in each dimension. These are relational and objective forms of knowing. Relational forms of knowing, with flexible, open, relational, and responsive are used more by women. In contrast, the objective/non-subjective way of knowing is related to logical and algorithmic processes, which results in discrimination and abstraction.

Although there are numerous studies on epistemological beliefs, Schommer (1990) tried to compose a systematic structure to define epistemological beliefs by putting Perry's (1970) and Dweck's and Leggett's (1988) studies together. Schommer (1990) suggested that an epistemological belief system has five independent dimensions. Schommer (1990) studied the effects of epistemological beliefs on cognition and academic performance and tried to compose an analytical structure for epistemological beliefs. In the beginning, Schommer (1990) conceptualized epistemological beliefs theoretically in five dimensions: structure, certainty of knowledge, source of knowledge, speed of learning processes, and direction of learning processes (Hofer & Pintrich, 1997). Later, as a result of validity studies on these five dimensions she composed epistemological beliefs in four independent dimensions: simple knowledge, certain knowledge, quick learning, and innate ability. Simple knowledge refers to beliefs about the structure of knowledge. This dimension is interested in whether individuals believe cumulative knowledge with a simple structure or relational knowledge with a complex structure. The certain knowledge dimension defines whether an individual believes certain and stable knowledge or contextual knowledge including temporary right/wrong. The quick learning dimension includes beliefs about the speed of the learning process. This dimension refers to an individual's belief about learning time and if it must be immediate, take time, or never be achieved. The innate ability dimension indicates people's belief in learning process control and refers to beliefs about learning ability and its structure as innate or developed with education and experience (Deryakulu, 2004).

Epistemological Beliefs and Training of Teachers

One sub-dimension of teachers' values is their belief in the structure of knowledge (epistemological belief) (Pajares, 1992). Epistemological belief has had an important place in recent studies. McGee and others (2000) stated that there has been an increase in the importance of epistemological belief studies due to the rise in the use of constructivist learning models in K12 classrooms.

Brownlee (2003) conducted a longitudinal study with 11 teachers. A curriculum was applied in a course during an elementary school teaching certificate program in order to improve the epistemological beliefs of teacher candidates. This curriculum was applied for a year, during which the candidates could execute their own epistemological beliefs. Three interviews were conducted, one before the program, one immediately after the program finished, and another three years after the participants started teaching. During these 30-70 minute long interviews, the change in epistemological belief and the way they constructed knowledge was observed. At the end of the study, the findings related to epistemological beliefs were placed into four categories: constructivist beliefs, mixed beliefs, subjective beliefs, and received beliefs. Participants with constructivist beliefs had personal truths supported with proof. Those with mixed beliefs stated that individuals could receive or construct knowledge. Persons with subjective beliefs stated that individuals created their own truths by instinct, without any need for proof. Finally, individuals with received beliefs accepted concrete truth as it is.

There have been studies to determine if epistemological beliefs differed depending on people's field of work (Feldman & Newcomb, 1969; Paulsen & Wells, 1998; Eren, 2007; Ozdemir & Koksal, 2014; Kazu & Erten, 2015; Terzi et al., 2015; Arslantas, 2016). The studies conducted showed that the more expertise learners have in their field, the more complex (sophisticated) epistemological beliefs they have (Belenky et al., 1986; Kitchener & King, 1981). These researches also showed that epistemological beliefs are influenced by factors such as gender, age, and the educational background of family. Additionally, contextual factors in early ages, such as family and school, are found to be influential on epistemological beliefs (Schommer, 1993).

McGee et al. (2000) carried out a four-week program that aimed to improve the epistemological beliefs of teachers, and determined the teachers' epistemological beliefs before and after the program, using Schommer's Epistemological Beliefs Questionnaire. In addition, they also reviewed the teachers' level of attainment using pre-test and post-test forms. In the research, 41 teachers enrolled in a master's program were given computer training in accordance with a constructivist environment over four weeks. At the end of the study, the teachers' epistemological belief significantly differed in three sub-dimensions of the instrument. The t-test results of the participating teachers showed significant improvement in simple knowledge, quick learning, and certain knowledge sub-dimensions.

Studies in epistemological beliefs show that individuals' beliefs relating to the nature of knowledge are an important factor in their understanding, questioning, interpreting, and determination in completing difficult academic tasks. For instance, if students think that knowledge consists of isolated pieces then it makes difficult for

them to understand subjects such as mathematics, medicine, and psychology (Schommer & Hutter, 2002). Teachers' epistemological beliefs can also influence their perspective of their own fields, thus influencing classroom practices. In this study, the epistemological beliefs of teacher candidates are determined and the relations between epistemological beliefs with gender, program of study, grade level, and academic success are investigated.

Method

Research Design

This is a descriptive study. In descriptive studies participants' beliefs or characteristics (knowledge, attitudes, interest, etc.) are described and correlational relations among variables can be studied (Buyukozturk, Kilic-Cakmak, Akgun, Karadeniz, & Demirel, 2013). In this framework, the study investigated the relationship between teacher candidates' epistemological beliefs and their academic success, gender, department, and the year of study.

Participants

The participants of this study included 564 teacher candidates from a public university. Of the participants, 354 were female (62.8%) and 210 male (37.2%), who were from four different teacher training programs (preschool teaching, primary school teaching, social science teaching, mathematics teaching). They filled the Turkish form of Schommer's Epistemological Beliefs Questionnaire. 43.4% of the participants were first grade students ($n= 245$), while 56.6% were ($n= 319$) fourth graders.

Research Instrument and Procedure

Schommer's Epistemological Beliefs Questionnaire (1990) was used in the study. The Epistemological Beliefs Questionnaire has a four dimensions or factors structure: knowledge is simple, knowledge is certain, learning occurs instantly, and the ability to learn is innate. Deryakulu and Buyukozturk (2002) adapted the Epistemological Beliefs Questionnaire (EBQ) into Turkish, and conducted its validity and reliability studies. In their study, conducted with 595 college students, it was noted that the questionnaire showed a three-factored structure as opposed to the common four-factored structure. The factors' names in this new form were: the belief that learning depends on effort, the belief that learning depends on talent, and the belief there is only one truth. Cronbach Alpha internal consistency coefficients were .83 for the first factor, .62 for the second factor, .59 for the third factor, and .71 for the entire questionnaire. The repeated factor analysis and reliability studies conducted by Deryakulu and Büyüköztürk in 2005 with 626 college students confirmed the three-factor structure; however, the number of items were reduced to 34. After a confirmatory factor analysis study, it was observed that the 24th item showed an inconsistency with its factor, so it was removed from the questionnaire and the number of items was reduced to 34. In this last study, the Cronbach Alpha internal consistency value was found as .84 for the first factor, .69 for the second factor, .64 for the third factor, and .81 for the entire questionnaire.

The questionnaire measures individuals' beliefs under these three sub-dimensions or factors in two extremes: sophisticated and naive. Individuals with naive epistemological beliefs believe that knowledge is certain, concrete, and in a structure that separates knowledge with bold lines. In this same group, it is believed that the learning process is fast and the talent for learning is constant. Individuals with sophisticated epistemological belief claim that knowledge is in a complex, uncertain structure and can be improved by reasoning. A low score from this questionnaire indicates a sophisticated epistemological belief and a high score indicates a naive epistemological belief.

Data Analysis

Independent samples t-test was applied to determine the gender and grade differences in epistemological beliefs. In order to define if teacher candidates' epistemological beliefs changed depending on registered program, one-way ANOVA for an independent sample was used. A correlation was calculated to determine the relation between epistemological beliefs and success.

Results

Differences in Epistemological Beliefs According to Gender

Independent samples t-test was applied to determine the difference in the epistemological belief of teacher candidates depending on their genders. The results of the independent samples t-test are presented in Table 1.

Table 1.

Comparison of Scores from the Epistemological Belief Questionnaire According to Teacher Candidates' Genders

<i>Belief</i>	<i>Gender</i>	<i>n</i>	<i>M</i>	<i>S</i>	<i>sd</i>	<i>t</i>	<i>p</i>
Learning Depends on Effort (Factor 1)	Female	354	31.13	6.10	562	2.08	.038
	Male	210	32.27	6.54			
Learning Depends on Talent (Factor 2)	Female	354	15.59	4.59	562	5.00	.000
	Male	210	17.84	8.02			
There is Only One Correct Knowledge (Factor 3)	Female	354	26.32	5.68	562	3.03	.003
	Male	210	27.74	4.87			

According to Table 1, the scores of teacher candidates differed significantly in all belief factors as "learning depends on effort" ($t_{562}=2.08$, $p<.05$), "learning depends on talent" ($t_{562}=5.00$, $p<.05$), and "there is only one correct knowledge" ($t_{562}=3.03$, $p<.05$). Female students had more sophisticated belief in that "learning depends on talent" ($M_{female}=31.13$) than male students ($M_{male}=32.27$). Similarly, female students had more sophisticated belief in that "learning depends on effort" ($M_{female}=15.59$) than male students ($M_{male}=17.84$). Lastly, male students had more naive belief in that "there is

only one correct knowledge" ($M_{\text{male}}=27.74$) than female students ($M_{\text{female}}=26.32$). In sum, female teacher candidates had more sophisticated beliefs than males for all three factors of the epistemological beliefs.

Differences in Epistemological Beliefs According to Teacher Candidates' Department

One-way ANOVA was applied in order to determine whether teacher candidates' epistemological beliefs showed significant differences depending on the program or department in which they were enrolled. One-way ANOVA results are given in Table 2.

Table 2.

Comparison of Scores from the Epistemological Belief Questionnaire According to Teacher Candidates' Department

Belief	Dept.*	n	M	S	sd	F	P	Significant Difference (Dunnnett C Test)
Learning Depends on Effort (Factor 1)	PT	181	30.19	6.28				
	EMT	173	33.75	6.28				
	PST	125	31.49	6.67				
	SST	85	30.08	5.95	563	12.14	.000	2-1, 2-3 and 2-4
Learning Depends on Talent (Factor 2)	PT	181	16.29	4.87				
	EMT	173	17.06	4.56				
	PST	125	15.94	6.38				
	SST	85	16.15	5.66	563	1.30	.273	
There is Only One Correct Knowledge (Factor 3)	PT	181	26.41	5.89				
	EMT	173	26.99	4.96				
	PST	125	27.21	5.21				
	SST	85	27.00	5.69	563	.64	.590	

*1:PT: Pre-School Teaching, 2:EMT: Elementary Mathematics Teaching, 3:PST: Primary School Teaching, 4:SST: Social Sciences Teaching.

As seen in Table 2, the scores of teacher candidates belief that "learning depends on effort" ($F_{(563)}=12.14$, $p<.05$) differed according to their department or programs. To determine the source of this difference, the Bonferroni test, which is used when variances are the same, was calculated. According to the results, the epistemological belief of elementary mathematics teaching students ($M_{\text{EMT}}=33.75$) were significantly more naive in the factor "learning depends on effort" than those studying pre-school teaching ($M_{\text{PST}}=30.19$), social sciences teaching ($M_{\text{SST}}=30.08$), and primary school teaching ($M_{\text{PT}}=31.49$) programs. There was not any significant difference in the other two factors of the questionnaire, "learning depends on talent" ($F_{(563)}=1.30$, $p>.05$) and

“there is only one correct knowledge” ($F_{(563)} = .64, p > .05$), according to teacher candidates’ programs of study.

Differences in Epistemological Beliefs According to Grade Level

Independent samples t-test was applied to determine if there was a difference in teacher candidates’ epistemological belief according to their grade levels. The results of the independent samples t-test are presented in Table 3.

Table 3.

Comparison of Scores from the Epistemological Belief Questionnaire Depending on Teacher Candidates’ Grade Levels

<i>Belief</i>	<i>Class</i>	<i>n</i>	<i>M</i>	<i>S</i>	<i>sd</i>	<i>t</i>	<i>p</i>
Learning Depends on Effort (Factor 1)	First Grade	245	30.88	6.01	562	2.22	.026
	Fourth Grade	319	32.07	6.45			
Learning Depends on Talent (Factor 2)	First Grade	245	16,42	4,80	562	.06	.949
	Fourth Grade	319	16,45	5,63			
There is Only One Correct Knowledge (Factor 3)	First Grade	245	28.49	5.27	562	6.52	.000
	Fourth Grade	319	25.59	5.22			

According to Table 3, teacher candidates’ epistemological beliefs in learning depends on effort dimension and differed significantly depending on their grade level ($t_{562}=2.22, p < .05$). Fourth grade students had a naive belief in “learning depends on effort” ($M_4=32.07$) than first grade students ($M_1=30.88$). Table 3 also shows that, in the “there is only one correct knowledge” dimension, teacher candidates’ belief differed significantly depending on their grade levels ($t_{562}=6.52, p < .05$). First grade students had more a naive belief ($M_1=28.49$) than fourth grade students ($M_4=25.59$). In the table, the scores of teacher candidates’ epistemological beliefs did not differ significantly in “learning depends on talent” ($t_{562}=.06, p > .05$) factor according to their grade level.

The Relation between Epistemological Belief and Success

In order to determine the direction and degree of the relations between students’ success and their scores from the sub-factors of the questionnaire, Pearson Correlation Coefficients between variables was calculated. Since a low score from the questionnaire indicates sophisticated epistemological belief, negative relationship must be interpreted as a positive relationship, indicating that students who had higher academic success had more sophisticated epistemological belief and students having low academic success had naive epistemological belief.

As a result of the analysis, a negative, low-level significant relation was found between students’ academic grades and the scores from the “belief that learning depends on effort” ($r = -.232, p < 0.01$), and the “belief that learning depends on talent”

($r=-.174$, $p<0.01$). In other words, students who had more sophisticated epistemological beliefs in these two factors had higher academic grades. Besides that, no significant relation was found between students' academic grades and the "belief in that there is only one correct knowledge" ($p>.05$).

Discussion and Conclusion

This study found that female students had more sophisticated epistemological beliefs in all three sub-dimensions. This result is similar to other studies in the literature (Deryakulu & Buyukozturk, 2005;). Result showed that female students had more sophisticated epistemological belief in "learning depends on effort and talent" than male students. Male students had a stronger belief in "there is only one correct knowledge" compared to female students.

When the areas of study were evaluated, it was observed that elementary mathematics teaching program students (who come from the scientific branch of high schools) had more naive epistemological belief in "learning depends on effort" compared to social science teaching students (who come from the verbal branch of high schools) and primary school teaching and pre-school teaching program students (who come from the branch that holds equal weight between science and social science). In other words, while teacher candidates enrolled in pre-school teaching, primary school teaching and social science teaching programs believed that "learning depends on effort" and "learning can be improved", the ones enrolled in the elementary mathematics teaching program believed it is a talent gained at birth. This result was consistent with similar studies in the literature (Jehng, Johnson, & Anderson, 1993; Enman & Lupart, 2000; Deryakulu & Buyukozturk, 2005; Arslantas, 2016). These studies showed that students who are studying in fields related to social sciences have a more sophisticated epistemological belief than those studying in fields related to sciences.

Regarding grade level differences in epistemological beliefs, student beliefs changed in the "learning depends on effort" and "there is only one correct knowledge" factors. First graders have a stronger belief in "learning depends on effort" compared to fourth graders. Alternatively, fourth grade students have a stronger belief in "there is only one correct knowledge". Perry (1968, as cited in Schommer, Crouse & Rhodes, 1992) and Eren's (2007) studies' results confirm this research's findings. Perry found that students start university with the belief that knowledge is certain, simple, and in the hands of an authority; but in the end they start to think knowledge is complex and temporary (Schommer et al., 1992). Eren (2007) found that university students show differences in the "learning depends on effort" and "there is only one correct knowledge" dimensions, depending on their grade levels. His study indicated that first year students had a stronger belief in "learning depends on effort" and "there is only one correct knowledge" compared to higher grade students.

The results also showed a relation between epistemological belief and academic success. Students with sophisticated belief in "learning depends on effort" and "learning depends on talent" have higher academic success. A similar study was

conducted by Schommer in 1993. Schommer examined the relation between epistemological belief and academic success in high school students. In the results of this study, a significant relation was found between the four dimensions between Schommer's original questionnaire and academic success. Schommer's study found that learners with a high IQ level and low tendency to the "quick learning" dimension have a higher academic success rate. It was also found that the "quick learning" dimension was a significant factor in explaining success. Dweck and Legget (1998) stated that if a person believes in an innate ability in learning then they feel desperation in solving complex academic tasks. In contrast, if students believe that learning ability can be improved then he/she makes a bigger effort, tries different study strategies, or presents a determined approach to accomplish difficult tasks. Arslantas (2016) also found a relationship between one sub-dimension of the scale (belief of learning depending on talent) with teacher candidates' Grade Point Averages.

The epistemological beliefs of teachers affect their classroom practices. Therefore, it is considered important to determine the epistemological beliefs of teacher candidates. In this descriptive study, teacher candidates' epistemological beliefs are investigated according to their genders, grade levels, programs, and academic successes. There is a need for experimental studies that test how the epistemological beliefs of teachers are reflected in classroom practices. Longitudinal studies would also show change in the epistemological beliefs of teacher candidates during their training period.

References

- Akyildiz, H. (1989). Ogretmen ozelliklerinin ogretim surecine etkisi [The impact of teacher characteristic on teaching process]. *Egitim ve Bilim*, 13 (74), 43-52.
- Arslantas, H. A. (2016). Epistemological beliefs and academic Achievement. *Journal of Education and Training Studies*, 4(1), 215-220.
- Belenky, M. F., Clichy, B. M., Goldberger, N. R., & Tarule, J. M. (1986). *Women's ways of knowing*. New York: Basic Books.
- Brownlee, J. (2003). Changes in primary school teachers' beliefs about knowing: A longitudinal study. *Asia- Pasific Journal of Teacher Education*, 31(1), 87- 97.
- Bruning, R. H., Schraw, G. J., & Ronning, R. R. (1995). *Cognitive psychology and instruction*. Englewood Cliffs, NJ: Prentice-Hall.
- Buyukozturk, S., Kilic Cakmak, E., Akgun, O. E., Karadeniz, S., & Demirel, F. (2013). *Bilimsel arastirma yontemleri* [Scientific research methods]. Ankara: Pegem Akademi.
- Deryakulu, D., & Buyukozturk, S. (2002). Epistemolojik İnanç Olcegi'nin gecerlik ve guvenirlik calismasi [Epistemological Belief Questionnaire validity and reliability study]. *Egitim Arastirmalari*, 2(8), 111-125.

- Deryakulu, D. (2004). Egitimde bireysel farklılıklar [Individual differences in education]. Kuzgun, Y. & Deryakulu, D. (Ed.), *Epistemolojik İnançlar [epistemological beliefs]*. (ss. 259-289). Ankara: Nobel Yayın-Dağıtım.
- Deryakulu, D., & Buyukozturk, S. (2005). Epistemolojik İnanç Ölçeği'nin faktör yapısının yeniden incelenmesi: cinsiyet ve öğrenim görülen program türüne göre epistemolojik inançların karşılaştırılması [The re-examination of the epistemological beliefs questionnaire's factor structure: comparing epistemological beliefs in terms of gender and program type]. *Eğitim Araştırmaları*, 5(18), 57-70.
- Dweck, C. S., & Leggett, E. L. (1988). A social-cognitive approach to motivation and personality. *Psychological Review*, 95(2), 256-273.
- Enman, M., & Lupart, J. (2000). Talented female students' resistance to science: An exploratory study of post-secondary achievement, motivation, persistence, and epistemological characteristics. *High Ability Studies*, 11(2), 161-178.
- Eren, A. (2007). Üniversite Öğrencilerinin epistemolojik inançları arasındaki farklılıkların incelenmesi [Examining the differences among undergraduate students' epistemological beliefs]. *Eğitim ve Bilim*, 32(145), 71-84.
- Feldman, K. A., & Newcomb, T. M. (1969). *The impact of college on students*. San Francisco: Jossey-Bass.
- Hofer, B. K., & Pintrich, P. R. (1997). The development of epistemological theories: Beliefs about knowledge and their relation to learning. *Review of Educational Research*, 67(1), 88-140.
- Jehng, J. J., Johnson, S. D., & Anderson, R. C. (1993). Schooling and students' epistemological beliefs about learning. *Contemporary Educational Psychology*, 18, 23-25.
- Kardash, C. A., & Scholes, R. J. (1996). Effect of preexisting beliefs, epistemological beliefs, and need for cognition on interpretation of controversial issues. *Journal of Educational Psychology*, 88(2), 260-271.
- Kazu, I.Y., & Erten, P. (2015). Öğretmen adaylarının epistemolojik inançlarının incelenmesi [Investigation of pre-service teachers' epistemological beliefs]. *Dicle Üniversitesi Ziya Gökalp Eğitim Fakültesi Dergisi*, 25, 57-75.
- Kitchener, K. S., & King, P. M. (1981). Reflective judgement: concepts of justification and their relationship to age and education. *Journal of Applied Developmental Psychology*, 2, 89-116.
- McGee, S., Howard, B. C., Schwartz, N., & Purcell, S. (2000). The experience of constructivism: Transforming teacher epistemology. *Journal of Research on Computing in Education*, 32(4), 455-465.
- Ozdemir, I., & Koksall, N. (2014). İlköğretim ikinci kademe öğretmenlerinin epistemolojik inançlarının değerlendirilmesi [The evaluation of elementary school teachers' epistemological belief]. *Ankara Üniversitesi Eğitim Bilimleri Fakültesi Dergisi*, 47 (1), 301-326.

- Pajares, M. F. (1992). Teachers' beliefs and educational research: cleaning up a messy construct. *Review of Educational Research*, 62(3), 307-332.
- Paulsen, M. B., & Wells, C. T. (1998). Domain differences in the epistemological beliefs of college students. *Research in Higher Education*, 39(4), 365-382.
- Posner, G., Strike, K., Hewson, P., & Gertzog, W. (1982) Accommodation of a scientific conception: Toward a theory of conceptual change. *Science Education*, 66(2), 211-227.
- Schommer, M., Crouse, A., & Rhodes, N. (1992). Epistemological beliefs and mathematical text comprehension: Believing it is simple does not make it so. *Journal of Educational Psychology*, 84(4), 435-443.
- Schommer, M. (1993). Epistemological development and academic performance among secondary students. *Journal of Educational Psychology*, 85(3), 406-411.
- Schommer, M., & Hutter, A. R. (2002). Epistemological beliefs and thinking about everyday controversial issues. *Journal of Psychology*, 136(1), 5-20.
- Terzi, A. A., Sahan, H. H., Celik, H., & Zog, H. (2015). Öğretmen adaylarının epistemolojik inançları ile eleştirel pedagoji ilkeleri arasındaki ilişki [The relation between teacher candidates' epistemological beliefs and critical pedagogy principles]. *Eğitim ve Öğretim Araştırmaları Dergisi*, 4(1), 344-356.
- Topdemir, H. G. (2008). *Felsefe [Philosophy]*. Ankara: Pegem Akademi.

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Özet

Problem Durumu: Bireyler açısından merkezi önemde olan zihinsel yapıları davranışların, tutumların, değerlerin ve inançların belirleyicisi konumundadır. Bireyler, zihinsel değerlendirmelerinin sonucu olarak kendi dünyalarını inşa etmektedirler ve bireylerin zihinsel değerlendirmeleri yaşam biçimi üzerinde belirleyici etkiye sahiptir. Formal bir eğitim sürecinde yeni davranışlar kazanırken oluşan/oluşturulan zihinsel yapı bireylerin, bilgiye ilişkin değerlendirmelerinde, nesnel ölçütlere yakınlığının veya uzaklığının belirleyicisi olacaktır. Diğer bir ifadeyle bireylerin zihinsel değerlendirmelerinin sonucu oluşturdukları bilgiye ve bilimsel süreçlere dair inançları, onların olay ve olguları açıklarken başvurdukları karar kaynaklarını, nesnel veya öznel ölçütlere göre değerlendirmelerinde davranışlarının yönünü belirleyecektir. Dolayısıyla zihinsel bir değerlendirme

sürecinin ürünü olan bilginin felsefesi veya bizim bilgiyi nasıl anladığımızı ve bildiğimizi içeren bir anlama sahip olan epistemoloji ve buna dair inançlar, bireylerin bilgiye ve bilimsel süreçlere ilişkin yaklaşımlarında belirleyici konumdadır. Epistemolojik inançlara ilişkin yapılan araştırmalar bireylerin bilginin doğasına ilişkin inançlarının bilgiyi anlamaları, sorgulamaları, yorumlamalarında ve zor akademik görevleri tamamlama kararlılıklarında önemli bir faktör olduğunu göstermektedir. Bu çerçevede epistemolojik inançlar konusu öğretim sürecine ilişkin son yıllarda yapılan araştırmalarda önemli bir yere sahiptir. Öğretmenlerin epistemolojik inançları onların konu alanlarına bakış açılarını ve sınıf içi uygulamalarını etkilemektedir. Bu çalışmanın problemi, öğretmen adaylarının öğretmenlik mesleği değerlerinden biri olan bilgiye ilişkin inançlarının (epistemolojik inanç) belirlenmesidir.

Araştırmanın Amacı: Bu araştırmanın amacı, öğretmen adaylarının öğretmenlik mesleği değerlerinden biri olan bilgiye ilişkin inançlarının (epistemolojik inanç) çeşitli değişkenlerle ilişkisinin incelenmesidir. Bu genel amaç çerçevesinde öğretmen adaylarının Schommer'ın Epistemolojik İnanç Ölçeği'nin alt faktörlerinden aldıkları puanların cinsiyete, program türlerine, sınıf düzeylerine göre anlamlı düzeyde farklılaşp farklılaşmadığına bakılmıştır. Ayrıca öğretmen adaylarının Schommer'ın Epistemolojik İnanç Ölçeği'nin alt faktörlerinden aldıkları puanlar ile akademik başarıları arasında ilişki olup olmadığı da araştırılmıştır.

Araştırmanın Yöntemi: Bu araştırma öğretmen adaylarının Epistemolojik İnanç Ölçeği'nden aldıkları puanların çeşitli değişkenlerle ilişkisinin belirlenmesini amaçlayan betimsel bir araştırmadır. Veri toplama aracı olarak Schommer tarafından geliştirilen ve Türkçeye uyarlamasının, geçerlik ve güvenilirlik çalışmalarının Deryakulu ve Büyükoztürk (2002) tarafından yapıldığı Epistemolojik İnanç Ölçeği (EİÖ) kullanılmıştır. Ölçek Öğrenmenin Çabaya Bağlı Olduğuna İnanç, Öğrenmenin Yeteneğe Bağlı Olduğuna İnanç, Tek Bir Doğrunun Var Olduğuna İnanç olarak üç boyuttan oluşmaktadır. Epistemolojik İnanç Ölçeği, bireylerin bu üç alt boyuttaki inançlarını gelişmiş (sophisticated) ve gelişmemiş (naive) olarak iki uçta ölçmektedir. Ölçekten alınan düşük puan gelişmiş epistemolojik inancı, yüksek puan gelişmemiş epistemolojik inancı göstermektedir. Araştırmanın çalışma grubunu, Cumhuriyet Üniversitesi Eğitim Fakültesi'nde öğretmenlik programlarına devam eden, dört farklı programda birinci ve dördüncü sınıfta öğrenim gören, 564 öğretmen adayı oluşturmaktadır. Bu çerçevede araştırma Okulöncesi Öğretmenliği, İlköğretim Matematik Öğretmenliği, Sınıf Öğretmenliği, Sosyal Bilgiler Öğretmenliği birinci ve dördüncü sınıf programlarında öğrenim gören öğrenciler üzerinde yapılmıştır. Öğrencilerin %43,4'ü (n= 245) birinci sınıfta, % 56,6'sı (n= 319) dördüncü sınıfta öğrenim görmektedir. Çalışma grubunun %62,8'i kız (n= 354), %37,2'si (n= 210) erkektir. Öğretmen adaylarının cinsiyetlerine ve sınıf düzeylerine göre epistemolojik inançlarındaki farklılığı belirlemek için ilişkisiz örneklem t-testi uygulanmıştır. Devam edilen programa göre farklılıkların belirlenebilmesi için ilişkisiz Örneklem için tek faktörlü ANOVA kullanılmıştır. Epistemolojik inanç ile başarı arasındaki ilişkiyi belirlemek için Pearson korelasyon analizi yapılmıştır.

Araştırmanın Bulguları: Öğretmen adaylarının Epistemolojik İnanç Ölçeği'nin üç alt boyutundan aldıkları puanlar cinsiyete göre anlamlı bir fark göstermektedir.

Araştırma kız öğrencilerin erkek öğrencilere göre ölçeğin üç alt faktörüne ilişkin daha gelişmiş epistemolojik inançlara sahip olduğunu göstermiştir. Öğretmen adaylarının Epistemolojik İnanç Ölçeği'nin birinci faktöründen aldıkları puanlar öğrenim gördükleri bölüme göre anlamlı fark göstermektedir. Epistemolojik inançlar ölçeğinin birinci faktörü olan "öğrenmenin çabaya bağlı olduğuna inanç" konusunda Sosyal Bilgiler, Okulöncesi ve Sınıf öğretmenliği programlarındaki öğrencilerin İlköğretim Matematik Öğretmenliği programındaki öğrencilere göre daha gelişmiş epistemolojik inanca sahip olduğu görülmektedir. Öğretmen adaylarının Epistemolojik İnanç Ölçeği'nin "öğrenmenin çabaya bağlı olduğuna inanç" faktöründen aldıkları puanlar sınıf düzeyine göre anlamlı fark göstermektedir. Birinci sınıf öğrencilerinin dördüncü sınıf öğrencilerine göre daha gelişmiş epistemolojik inanca sahip olduğu görülmüştür. Birinci sınıf öğrencilerinin öğrenmenin çabaya bağlı olduğuna dair inançları dördüncü sınıf öğrencilerinden daha yüksektir. Diğer taraftan "tek bir doğrunun var olduğuna inanç" konusunda dördüncü sınıf öğrencilerinin daha yüksek düzeyde bir epistemolojik inanca sahip oldukları görülmüştür. Araştırma sonuçları epistemolojik inanç ile başarı arasında da ilişki olduğunu göstermiştir. Öğrenmenin çabaya bağlı olduğuna ve yeteneğe bağlı olduğuna ilişkin gelişmiş epistemolojik inanca sahip öğrencilerin akademik başarılarının da yüksek olduğu görülmüştür. Bunun yanında, öğrencilerin akademik başarı notları ile "tek bir doğrunun var olduğuna inanç" faktöründen aldıkları puanlar arasında anlamlı bir ilişki bulunmamaktadır ($p > .05$).

Araştırmanın Sonuçları ve Önerileri: Tarama modelindeki bu çalışmada, öğretmen adaylarının cinsiyetleri, öğrenim gördükleri sınıf düzeyi, programları ve başarı düzeyleri ile epistemolojik inançları arasındaki ilişki incelenmiştir. Epistemolojik inançların bireylerin bilginin doğasına ilişkin inançları olduğu düşünüldüğünde öğretmenin sınıf içi uygulamalarını etkileyecek önemli bir değişken olduğu varsayılmaktadır. Bu nedenle öğretmen adaylarının epistemolojik inançlarını belirlemek eğitim-öğretim ortamları açısından önemli görülmektedir. Araştırma bulguları, incelenen tüm değişkenler açısından da epistemolojik inançların farklılaştığını ortaya koymaktadır. Epistemolojik inançların öğretmenlerin sınıf içi uygulamalarına yansımalarının test edildiği deneysel çalışmalara ve öğretmen adaylarının yetiştirilmesi sürecinde epistemolojik inançlarındaki değişimin gözlemlendiği uzun süreli çalışmalara ihtiyaç vardır.

Anahtar Kelimeler: Epistemoloji, epistemolojik inançlar ölçeği, öğretim, öğretmen eğitimi.