Investigation of Lifelong Learning Competency Beliefs of Preservice Teachers from Different Departments using Latent Class Analysis

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In this study, lifelong learning competency beliefs of 1242 preservice teachers from four different departments at a state university in the west of Turkey were investigated using Latent Class Analysis (LCA). As a result, it was found that these beliefs consisted of four different homogeneous sub-groups. Then the probabilities of preservice teachers from different genders, years of study, department, age, GPA, location, high school type, epistemological orientation and self-competency belief profiles to be in these significant sub-groups were determined. Senior and self-competent preservice teachers were found most likely to be in the "most competent group".

INTRODUCTION

Lifelong learning has recently assumed one of the most privileged areas of educational studies in the world and is defined as a concept which takes place anywhere. It transcends the limits of place, time, age and educational level (Coşkun and Demirel, 2012; Güleç et al., 2012). The term was explained as "learning from cradle to grave" and has been stressed after the mid-1990s (EC, 2003; Toprak and Erdoğan, 2012; Teyfur, 2009). Lifelong learning is learning activities that develop individuals personally, socially and professionally, develop their abilities and competencies in order to provide opportunities for employment (Borat, 2010). Individuals need a lifelong learning approch to be able to keep pace with the rapid changing society and operate efficiently in their professional lives (Uzunboylu and Hürsen, 2011). This approach serves the purpose of providing cooperation opportunities in educational settings to raise an awareness of continuity in learning and foster citizens who consistently improve themselves (Güler, 2004). The approach allows the individual to keep up with the information society and to actively participate in real life (MEB, 2006). Although lifelong learning is a concept centered at individual development (Erdamar, 2011: 220), it is also believed to serve social integration (Candy, 2003) and economic development (DPT, 2001).

In recent years, the concept has been frequently pronounced and incorporated into strategical plans and prospective policies of many governments. As a matter of fact, European Union (EU) has declared

1996 as "lifelong learning year" and called the member and candidate countries to develop long-term projects (Akbaş and Özdemir, 2002). In 2007, European Framework for key competencies in lifelong learning was identified by EU Education and Culture Commission. This was an extension to the recommendations made by European Parliament (Figel, 2007). In this report, key competencies were listed under eight headings such as "communication in native language", "mathematics, science and technology competency", "digital competency", "learning learning", "social and citizenship competency", "initiative taking and entrepreneurship competency" and "cultural awareness and expression competency" (European Commission (EC), 2007).

This sine qua non (essential) process of "continuously and adaptively learning" which has been politically and strategically accepted as essential by international bodies such as EU should be delivered via learning opportunities (Özcan and Uzunboylu, 2012), transferred through teachers and delivered to all students (Harpe and Radloff, 2001). In this chain of causality, a nation or worldwide adoption of individual and social lifelong learning depends on the degree to which teachers are competent and had been prepared accordingly (Chapman et al., 2003). Preservice teachers are expected to be information, technology, communication and learning literate to be able to relieve the increasing pressure of the society to foster "lifelong learning" students (Akkoyunlu, 2008; Demiralay and Karadeniz, 2008).

The existing body of research on lifelong learning competencies and related beliefs mostly concentrated on how these competencies developed (Hart, 2006; Litzinger et al., 2001; Loads, 2007) or should be improved (Nicolaescu, 2012; Harpe and Radloff, 2001; Soni, 2012; Steffens, 2015). In Turkey, the number of studies on lifelong learning is constantly increasing and these studies usually concentrate on teachers and university students. These studies range from government or corporate reports to primary or secondary research papers. Methodically, they use versatile approaches ranging from comprehensive literature reviews to scale development, and from descriptive methods to correlational or inferential ones. Some of these studies addressed lifelong learning on its own right (Coşkun and Demirel, 2012) and examined levels of lifelong learning competency subdimensions of teachers (Ayra and Kösterelioğlu, 2015; Selvi, 2011) or preservice teachers (Demirel and Yağcı, 2012; İzci and Koç, 2012). Other correlational studies revealed the degree to which some demographic variables such as gender (Adabaş, 2016; Gencel, 2013; Konokman and Yelken, 2014; Kozikoğlu, 2014; Şahin and Arcagök, 2014; Şahin et al., 2010; Tunca et al., 2015; Yıldırım, 2015), department and Grade Point Average: GPA (Gencel, 2013; Karakuş, 2013; Tunca et al., 2015) or school type (Kozikoğlu, 2014) led to variation in lifelong learning competencies and reported conflicting results. Some studies also examined the associations between self-competency and lifelong learning competency beliefs (Ayra and Kösterlioğu, 2015).

Although, most of the previous studies examined sub-dimensions of lifelong learning competency (beliefs) seperately (Gencel, 2013; İzci ve Koç, 2012; Şahin et al., 2010) or as a whole (Şahin ve Arcagök, 2014; Yıldırım, 2015), no studies were encountered yet which examine the existence of significant and homogenous sub-groups of lifelong learning competency beliefs. If such sub-groups (classes) i.e., distinct profiles could be discovered, this might provide new insight into what these profiles meant and how they could be interpreted to understand the effects of demographic variables and other beliefs structures on lifelong learning competency beliefs. It's possible to reveal whether such sub-groups exist using latent class analysis.

In this context, the research problems in this study were stated as follows:

1. Are there significant and homogenous subgroups (latent classes) of preservice teachers' lifelong learning competency beliefs?

2. If there are, how is the membership of these latent classes predicted by demographic variables of gender, years of study, department, age, GPA, location, high school type and location of origin?

3. If there are, how is the membership of these latent classes predicted by epistemological and self-competency belief levels of the same preservice teachers?

METHOD

Study sample

Firstly, the study sample is illustrated in Table 1.

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TABLE 1
STUDY SAMPLE

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Variable	Variable Levels	Frequency	Percentage (%)
Gender	Female	753	60,6
	Male	489	39,4
Year of study	1st Year	239	19,2
	2nd Year	197	15,9
	3rd Year	431	34,7
	4th Year	375	30,2
Program Type	First	871	70,1
	Second	371	29,9
Department	Turkish Ed.	206	16,6
	Science Ed.	323	26,0
	S. Science Ed.	311	25,0
	Primary Ed.	402	32,4
High school	Anatolian	335	27,0
	Anatolian Teacher	46	3,7
	Science	12	1,0
	General	785	63,2
	Vocational	64	5,2
Age	-19	122	9,8
	20 - 21	473	38,1
	22 - 23	531	42,8
	24+	116	9,3
GPA	2.01 - 2.50	199	16,0
	2.51 - 3.00	520	41,9
	3.01 - 3.50	428	34,5
	3.51 - 4.00	95	7,6
Location	Metropolitan	423	34,1
	Province	189	15,2
	County	385	31,0
	Town	103	8,3
	Village	142	11,4
	Total	1242	100

Instruments

In this study, possible significant and homogenous sub-groups of lifelong learning beliefs in the study sample were investigated using latent class analysis. For that purpose, firstly the Scale for Lifelong Learning Competencies that was developed by Uzunboylu and Hürsen (2011) was used. This scale has a reliability value of .95. The scale consisted of 51 items and six dimensions such as "self-direction competence" (13 items), "learning to learn competence" (12 items), "sense of initiative and

entrepreneurship competence" (10 items), "obtaining knowledge competence" (6 items), "digital competence" (6 items) and "decision-making competence" (4 items) (Uzunboylu and Hürsen, 2011).

Secondly, the Scale for Epistemological Beliefs that was developed by Schommer (1995) and adapted into Turkish by Deryakulu and Büyüköztürk (2005) and whose three-factor structure has been confirmed by the authors (under review) was used. This scale has a reliability coefficient of 0.81 and consisted of three sub-dimensions as "knowledge is acquired through effort", "knowledge is acquired through ability" and "there's only a single truth". Finally, the Teacher Self-Competency Scale that was developed by Tschannen-Moran and Hoy (2001) and adapted into Turkish by Çapa, Çakıroğlu and Sarıkaya (2005) was used. This scale had a reliability coefficient of .94 for the whole scale and .87, .91 and .90 respectively for its three sub dimensions as "student engagement", "instructional strategies" and "classroom management".

Data Analysis

In this study, Latent Class Analysis (LCA) was used to identify possible significant and homogenous sub-groups of lifelong learning beliefs in the study sample and then to specify the contributions of demographic variables to predict these group memberships. In order to identify the best model to represent the data, different number of classes (usually between 1-4 or 1-6) were tested and their parameters were compared. Always more parsimonious and simpler models were sought. In this effort, one criterion to select the best fitting model is to choose the solution which has the minimum Bayesian Information Criteria (BIC) value (Magidson and Vermunt, 2001; 2004). Another criterion to select the best fitting model might be to choose the solution which has the minimum Akaike Information Criteria (AIC) value (Dias, 2006). Another criterion might be to choose the solution which has the minimum ΔBIC or ΔAIC value (Nylund et al., 2007). One last criterion might be to choose the solution which has a higher entropy value (Ramaswamy et al., 1993). In this study, all these criteria were tested but mainly minimum BIC criterium was used as a reference. In order to determine the class membership probabilities of preservice teachers in terms of epistemological and self-competency beliefs, these beliefs were divided into two groups for each dimension(factor) as "high(above average)" and "low(below average)".

FINDINGS

In this part of the study, the findings of the study were presented. Firstly, fit indices of different latent class solutions for lifelong competency beliefs of preservice teachers were illustrated in Table 2. Then the number of significant latent classes which define the homogeneous subgroups in the sample were identified. The number and composition of these latent classes were interpreted both looking at the statistical probabilities and theoretical structure. Then the probabilities of preservice teachers from different genders, years of study, department, age, GPA, location, high school type, epistemological orientation and self-competency belief profiles to be in these significant sub-groups were determined.

Identification of the Number and Compositions of Significant Latent Classes

In Latent Class Analysis (LCA) using Latent Gold software several fit indices, information criteria and statistical significance levels were calculated. Fit indices and information criteria found in LCA are presented in Table 2.

TABLE 2
FIT INDICES OF DIFFERENT LATENT CLASS SOLUTIONS FOR LIFELONG LEARNING COMPETENCY BELIEFS ($N = 1242$)

Model	No of Classes	BIC (LL)	AIC (LL)	Npar	Class.Err.	Entropy	DIFF (BIC)	DIFF (AIC)
1	1	10362,20	10331,45	6	0,0000	1,00	-	-
2	2	8388,50	8321,88	13	0,0333	0,87	1973,7	2009,57
3	3	8269,54	8167,05	20	0,0661	0,81	118,96	154,83
4	**4**	**8175,57**	**8032,21**	**27**	**0,1199**	**0,80**	**93,97**	**134,84**
5	5	8207,53	8033,29	34	0,1573	0,72	-31,96	-1,08
6	6	8245,07	8034,96	41	0,1574	0,72	-37,54	-1,67

Based on the minimum BIC criteria (BIC = 8175,5795) shown in Table 2, the best fitting model was chosen as the four-class solution. An entropy value of 0,8094 for the four-class model was found satisfactory (Blömeke, 2012) and supported the previous decision of choosing the four-class solution. In the analysis, both min AIC and min BIC were used. According to the best-fitting four-class solution, the probability of each preservice teacher to be classified in the four different classes were shown in Table 3.

TABLE 3
FINAL CLASS PROPORTIONS FOR THE FOUR-CLASS SOLUTION

Latent Class	Proportion (%)
1	37.2
2	31.7
3	15.5
4	15.5

Across the sample, a classification into class 1 was most likely for a preservice teacher with a probability of 37.2 %. A preservice teacher was classified into class 2 with a probability of 31.7 % and into class 3 or 4 with a probability of 15.5 %. According to these findings one dominant latent class of lifelong competency beliefs did not exist. Instead, there was a balanced distribution of preservice teachers to four different latent classes.

The scale used in this study to determine preservice teachers' lifelong competency beliefs consisted of 51 items which focused on six dimensions such as "self-direction competence" (13 items), "learning to learn competence" (12 items), "sense of initiative and entrepreneurship competence" (10 items), "obtaining knowledge competence" (6 items), "digital competence" (6 items) and "decision-making competence" (4 items) (Uzunboylu and Hürsen, 2011). The compositions of the four classes formed according to these six dimensions are shown in Figure 1.

FIGURE 1
PROBABILITY OF LIFELONG LEARNING COMPETENCY BELIEFS EXPERIENCED BY PRESERVICE TEACHERS
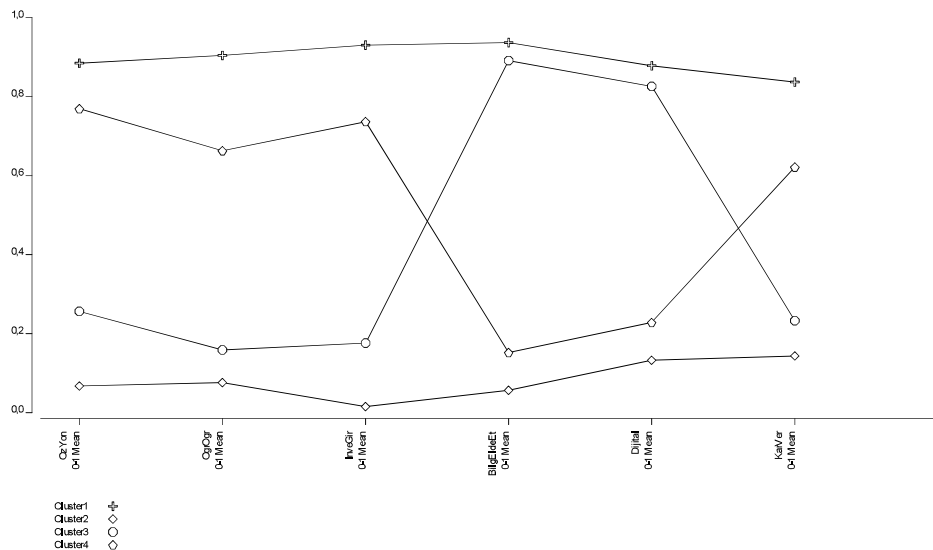

Figure 1 illustrates that preservice teachers grouped in class 1 had highest levels of competency beliefs in all six dimensions of lifelong learning. On the other hand, preservice teachers grouped in class 2 had lowest levels of beliefs in all six dimensions. Lifelong competency beliefs experienced by preservice teachers in the third class were all low excluding "digital competence" and "obtaining knowledge" dimensions. In contrast, preservice teachers from the fourth class had high levels of beliefs in all but "digital competence" and "obtaining knowledge" dimensions. Class 2 is almost the reverse of class 1 and similarly class 4 is the reverse of class 3.

Homogeneity or Heterogeneity Across Levels of Demographic Variables?

In the LCA explained above, competency beliefs in all six dimensions of lifelong learning were treated as indicators of the analyses based on which the latent classes were identified. At this stage, demographic properties of the preservice teachers such as gender were treated as "inactive" covariates in the analysis. However, it's also possible to specify the contribution of these variables in predicting the group membership. For this aim, the demographic variables of gender, years of study, department, age, GPA, location, high school type will be examined to predict group membership. The findings of this addition are shown in Table 4.

TABLE 4
PROBABILITY OF CLASS MEMBERSHIP PREDICTED BY DEMOGRAPHIC VARIABLES

Variable	Variable Levels	Variable Level Code	Most competent Class 1 (%)	Least Competent Class 2 (%)	Only Digital Competent Class 3 (%)	Only Digital Incompetent Class 4 (%)	Total Probability (%)
Gender	Female	1	38	32	14	15	100
	Male	2	31	33	23	13	100
Year of study	1st Year	1	31	38	14	17	100
	2nd Year	2	31	35	21	13	100
	3rd Year	3	36	30	19	15	100
	4th Year	4	47	25	13	15	100
Program Type	First	1	34	35	16	15	100
	Second	2	44	26	15	15	100
Department	Turkish Ed.	1	43	25	15	16	100
	Science Ed.	2	37	32	17	14	100
	S. Science Ed.	3	36	30	15	19	100
	Primary Ed.	4	36	36	17	12	100
High school	Anatolian	1	39	29	22	10	100
	Anatolian Teacher	2	31	37	30	1	100
	Science	3	23	29	22	26	100
	General	4	42	29	16	13	100
	Vocational	5	33	27	27	13	100
Age	-19	1	35	36	16	13	100
	20 - 21	2	34	34	13	18	100
	22 - 23	3	40	32	15	12	100
	24+	4	39	23	23	15	100
GPA	2.01 - 2.50	1	26	35	24	16	100
	2.51 - 3.00	2	37	32	17	15	100
	3.01 - 3.50	3	43	29	13	15	100
	3.51 - 4.00	4	39	33	7	21	100
Location	Metropolitan	1	40	28	16	15	100
	Province	2	40	32	15	14	100
	County	3	37	29	22	12	100
	Town	4	31	35	7	26	100
	Village	5	30	38	13	19	100

First, homogeneity of the classes across genders might be examined. According to Table 4, almost the same percentage of both genders are likely to be classified in the least competent class (class 2). However, 7 % more females are likely to be classified in the most competent class (class 1) and 3 % more females are likely to be classified in the only digital incompetent class (class 4). In addition, 8 % more males are likely to be classified in class 3. In short, a higher percentage of females have top level beliefs of lifelong learning competence. When homogeneity of the classes across different years of study is examined, almost one half (47 %) of the senior preservice teachers are most likely to be classified in the most competent class (class 1) and only a quarter of them in the least competent class (class 2). One third of preservice teachers in each of 1st to 3rd years of study could be classified in the most competent class (class 1) and again one third of preservice teachers in each of 1st to 3rd year of study could be classified in the least competent class (class 2). At this point, it could be argued that in the 4th year, preservice teachers had experienced a leap in lifelong learning competency beliefs.

When homogeneity of the classes across different program types is examined, almost the same percentage (15 %) of both program types were classified in the only digital competent class (class 3) or in the only digital incompetent class (class 4). A considerably higher percentage of preservice teachers from the second program type were in the most competent class (class 1) and a considerably lower percentage of preservice teachers from the second program type were in the least competent class (class 2). This seems like a contradiction because preservice teachers in the second program type had been admitted to faculties of education with lower university entrance examination scores. Then homogeneity of the classes across different program types was examined. According to Table 4, almost the same percentage of preservice teachers from Science, Social Sciences and Primary Education departments were classified in the four classes. In contrast, a considerably higher percentage (almost 10 %) of preservice teachers in Turkish education department were in the most competent class (class 1) and a considerably lower percentage (almost 10 %) of preservice teachers in this department were in the least competent class (class 2). Turkish preservice teachers had considerably higher percentage of lifelong learning competency beliefs. When homogeneity of the classes across different high school backgrounds is examined, preservice teachers coming from general high schools had the highest probability (% 42) to be classified in the most competent class (class 1) and preservice teachers coming from science schools had the lowest probability (% 23) to be classified in the least competent class (class 2). Here, there seems to be another contradiction. Science high schools admit best student in Turkey so preservice teachers from these school are expected to have highest lifelong learning competency beliefs. However, in this study they were found least likely to be classified in the most competent class (class 1) and it should be noted that they made up only 1 % (N = 12) of the study sample so this finding might be skewed. In addition, older preservice teachers at age 22 – 23 or +24 were considerably more likely (app. 5 % more) to be classified in in the most competent class (class 1). Moreover, oldest preservice teachers at age +24 were considerably less likely (at least 10 % less) to be classified in the least competent class (class 2). Other probabilities were found to follow the usual class membership probabilities of the baseline 4-class model. Moreover, preservice teachers having higher GPA's were more likely to be classified in the most competent class (class 1) and almost half of (43 %) those preservice teachers having a GPA between 3.01 - 3.50 were classified in the most competent class. Finally, preservice teachers from urban regions (Metropolitan or province) were considerably more likely (app. 10 % more) to be classified in in the most competent class (class 1) than preservice teachers from rural areas (town or village).

Homogeneity or Heterogeneity Across Levels of Epistemological and Self-Competency Beliefs?

In the previous LCA competency beliefs in all six dimensions of lifelong learning were treated as indicators of the analyses and demographic properties of the preservice teachers such as gender were treated as "inactive" covariates in the analysis to predict group membership. The same procedures might be conducted for epistemological and self-competency beliefs. At this stage, preservice teachers' levels of epistemological and self-competency beliefs will be examined to predict group membership. The findings of these tests are shown in Table 5.

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TABLE 5
PROBABILITY OF CLASS MEMBERSHIP PREDICTED BY LEVELS OF
EPISTEMOLOGICAL AND SELF-COMPETENCY BELIEFS

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Variable	Sub dimensions (Factors)	Variable Levels	Most competent Class 1 (%)	Least Competent Class 2 (%)	Only Digital Competent Class 3 (%)	Only Digital Incompetent Class 4 (%)	Total Probability (%)
Epistemological beliefs	Effort	Low	14	56	18	12	100
		High	51	15	19	15	100
	Ability	Low	37	29	20	14	100
		High	69	9	4	18	100
	Single Truth	Low	36	30	20	14	100
		High	68	8	8	16	100
Self-competency beliefs	Engage	Low	23	41	22	13	100
		High	64	7	14	15	100
	Strategies	Low	22	41	23	14	100
		High	63	9	14	14	100
	Management	Low	22	42	22	14	100
		High	61	10	15	14	100

First, homogeneity of the classes across different levels of sub dimensions of epistemological beliefs might be examined. Table 5 illustrates that preservice teachers having high levels in all sub dimensions of epistemological beliefs were dominantly classified (51, 69 and 68 % respectively) in the most competent class (class 1). It's also true that preservice teachers having low levels in "effort" sub dimension of epistemological beliefs were dominantly classified (56 %) in the least competent class (class 2) whereas that was not the case for "ability" and "single truth" sub dimensions (29 and 30 % respectively). Shortly, having high levels of epistemological beliefs in all three sub dimensions led to higher lifelong learning competency beliefs however the inverse only held for "effort" sub dimension.

Table 5 also demonstrates how homogeneous the classes are across different levels of sub dimensions of self-competency beliefs. LCA findings reveal that preservice teachers having high levels in all sub dimensions of self-competency beliefs were dominantly classified (64, 63 and 61 % respectively) in the most competent class (class 1) and those having low levels in all sub dimensions of self-competency beliefs were dominantly classified (41, 41 and 42 % respectively) in the least competent class (class 2).

RESULTS AND DISCUSSION

In this study, lifelong learning competency beliefs of 1242 preservice teachers from four different departments were investigated with a different perspective using latent class analysis. In this method, statistically significant and distinct subgroups of these beliefs were determined using several fit criteria such as minimum BIC, minimum ∆BIC or maximum entropy. As a result of model fit comparisons, the four-class solution was selected as the best model to explain the data at hand. In this solution, there were four homogeneous classes which were named respectively as "most competent class" (class 1, 37%), "least competent class" (class 2, 31%), "only digital and information competent" (class 3, 16%) and "only digital and information incompetent" (class 4, 16%).

After the latent classes were identified and named, the probabilities of different demographic groups to be a member of these classes were determined. These analyses revealed that preservice teachers who are i.) female, ii) older or in their last year of study, iii) in Turkish Education department, iv) graduates of normal high schools, v) having higher GPAs and vi) from urban areas are most likely to be classified in the "most competent class" (class 1). The composition of the "least competent class" (class 2) was quite

the opposite of the "most competent class" (class 1). The other two classes, i.e. "only digital and information competent" (class 3) and "only digital and information incompetent" (class 4) demonstrated a heterogeneous and sample-alike composition.

Females having a higher probability to be classified in the "most competent class" (class 1) is consistent with the results of some of the previous studies (Crick et al., 2004; Coşkun and Demirel, 2012; Coşkun Diker, 2009; Demirel and Akkoyunlu, 2010; Gencel, 2013; Kılıç, 2014; Yavuz Konokman and Yelken, 2014; Leathwood and Francis, 2006; Sullivan, 2003; Şahin et al., 2010) but not with all (Şahin and Arcagök, 2014). These conflicting results were interpreted in this study in favor of those who reported that gender variable led to significant variation in lifelong competency beliefs in favor of females. Research from other fields which report that gender is significant in motivation, communication and intercultural values (Mwamwenda, 1992; Ainley, 2006; Chu, 2010), individual learning processes (Kesici ve diğ., 2009) and participation in economy (Eurostat, 2005) supports the inference that females have an advantage. Preservice teachers who are in their last year of study (seniors) having a higher probability to be classified in the "most competent class" (class 1) is consistent with the results of previous studies (Coşkun and Demirel, 2012; Karakuş, 2013; Kirby et al., 2010; Oral and Taha, 2015). Preservice teachers in Turkish Education department having a higher probability to be classified in the "most competent class" (class 1) is consistent with results of some of the previous studies (Oral and Taha, 2015; Selcuk, 2016) but not with others (Arsal, 2011; Kozikoğlu, 2014). Identifying the real effects of this variable warrants further causal comparative studies. In this study, preservice teachers who are graduates of general high schools were found to have higher probability to be classified in the "most competent class" (class 1). Though, the previous literature about this variable is quite confusing ranging from opposite results (Ödemiş, 2014; Tuncer and Tanaş, 2011) to results arguing that this variable had no effect (Selçuk, 2016). This variable should also be further explored. Preservice teachers who are older having a higher probability to be classified in the "most competent class" (class 1) is consistent with the results of some of the previous studies (Hürsen, 2011; Kılıç, 2014) but not with others (Kavtelek, 2014). Age variable seems to be acting together with other variables such as year of study. Preservice teachers with higher GPAs having a higher probability to be classified in the "most competent class" (class 1) is also consistent with the results of most of the previous studies (Coşkun and Diker, 2009; Ekinci, 2008) except one (Selçuk, 2016). Despite the results of Selçuk (2016), which might be criticized to be skewed for this variable, the results of this study along with most of the previous ones support the fact that having higher academic achievement is highly and positively correlated with having high lifelong learning competencies. Preservice teachers from urban areas having a higher probability to be classified in the "most competent class" (class 1) is consistent with the results of half of the previous studies (Hürsen, 2011) but not with the other half (Selçuk, 2016). This variable should also be interpreted with caution.

In terms of the same preservice teachers' epistemological and self-competency beliefs it can be safely argued that higher levels in all three dimensions of epistemological and again in all three dimensions of self-competency beliefs seem to correlate with being classified in the "most competent class" (class 1). Lower levels of these belief dimensions led to be classified in the "least competent class" (class 2) except the ability and single truth dimensions of epistemological beliefs. This finding is in line with previous results (Ayra and Kösterelioğlu, 2015; Özçiftçi ve Çakır, 2015; Selçuk, 2016).

As a conclusion, it can be safe to argue that only one third of all preservice teachers (37 %) have high level of lifelong competency beliefs in all subdimensions (factors); digital and information obtaining subdimensions might be most problematic areas of lifelong learning competency that should be dealt with in teacher preparation. In terms of demographic variables; gender, year of study and GPA might be argued to be positively and highly correlated with lifelong learning competency beliefs. Finally, preservice teachers' epistemological and self-competency beliefs are also highly correlated with lifelong learning competency beliefs. Future studies might concentrate on demonstrating the effects of other demographic variables.

REFERENCES

Adabaş, A. (2016). *Bartın Üniversitesi Lisansüstü Eğitim Öğrencilerinin Yaşam Boyu Öğrenmede Anahtar Yeterliklere Sahip Olma Düzeyleri*. Yüksek Lisans Tezi, Bartın Üniversitesi, Eğitim Bilimleri Enstitüsü. Bartın.

Ainley, M. (2006). Connecting with Learning: Motivation, Affect and Cognition in Interest Processes. *Educational Psychology Review, 18*(4), 391–405.

Akbaş, O., and Özdemir, S. M. (2002). Avrupa Birliğinde Yaşam Boyu Öğrenme. *Milli Eğitim Dergisi*, 155-156.

Akkoyunlu, B. (2008). *Information Literacy and Lifelong Learning*. Keynote Speech. from: ietc2008.home.anadolu.edu.tr/ietc2008/1b.doc (Accessed on 14th July 2017)

Arsal, Z. (2011). *Lifelong Learning Tendencies of the Prospective Teachers in The Bologna Process in Turkey*. ATTE Annual Conference 2011: Teachers' Lifecycle from Initial Teacher Education to Experienced Professional, Latvia University, Riga 496-509.

Ayra, M. ve Kösterelioğlu, İ. (2015). Öğretmenlerin Yaşam Boyu Öğrenme Eğilimlerinin Mesleki Öz-Yeterlik Algıları ile İlişkisi. *NWSA-Education Sciences, 1*, 17-28.

Blömeke, S. (2012). Content, Professional Preparation, and Teaching Methods: How Diverse is Teacher Education Across Countries? *Comparative Education Review, 56*(4), 684-714.

Borat, O. (2010). Hayat Boyu Öğrenme Kapsamında Eğitim Sektöründe Beklenen Gelişmeler. Millî Eğitim Bakanlığı Projeler Koordinasyon Merkezi. *Projeler Dergisi, (2)*, 32-44.

Candy, P. C. (2003). *Lifelong Learning and Information Literacy*. Report for U.S. National Commission on Libraries and Information Science and National Forum on Information Literacy.

Chapman, J., Toomey, R., Gaff, J., McGlip, J., Walsh, M., Warren, E., & Williams, I. (2003). *Lifelong Learning and Teacher Education*. Canberra: Australian Government Department of Education, Science and Training.

Chu, R. J.C. (2010). How Family Support and Internet Self-Efficacy Influence the Effects of E-Learning Among Higher Aged Adults – Analyses of Gender and Age Differences. *Computers and Education, 55*, 255–264.

Coşkun Diker, Y. ve Demirel, M. (2012). Üniversite Öğrencilerinin Yaşam Boyu Öğrenme Eğilimleri. *Hacettepe Üniversitesi Eğitim Fakültesi Dergisi, 42*, 108-120.

Coşkun Diker, Y. (2009). *Üniversite Öğrencilerinin Yaşam Boyu Öğrenme Eğilimlerinin Bazı Değişkenler Açısından İncelenmesi*. Doktora Tezi, Hacettepe Üniversitesi, Sosyal Bilimler Enstitüsü, Ankara.

Crick D. R., Broadfoot P. and Claxton G. (2004). Developing an Effective Lifelong Learning Inventory: The ELLI Project. *Assessment in Education, 11*(3), 247272.

Çapa, Y., Çakıroğlu, J., and Sarıkaya, H. (2005). Development and Validation of Turkish Version of Teachers" Sense of Efficacy Scale. *Eğitim ve Bilim, 30*(137), 74-81.

Demiralay, R. and Karadeniz, Ş. (2008). Developing Information Literacy Skills for Lifelong Learning in Elementary Education. *Cypriot Journal of Educational Sciences, 2*(6), 89-119.

Demirel, M. and Akkoyunlu, B. (2010). *Öğretmen Adaylarının Fen ve Teknoloji Öğretimi Öz-yeterlik İnançlarının ve Öğrenme Stillerinin Değerlendirilmesi*. Uluslararası Öğretmen Yetiştirme Politikaları ve Sorunları Sempozyumu II, 16–18 Mayıs, Hacettepe Üniversitesi, Ankara.

Demirel, M. ve Yağcı, E. (2012). Sınıf Öğretmeni Adaylarının Yaşam Boyu Öğrenmeye İlişkin Algıları. *Hacettepe Üniversitesi Eğitim Fakültesi Dergisi, (1)*, 100-111.

Deryakulu, D. ve Büyüköztürk, Ş. (2005). "Epistemolojik İnanç Ölçeğinin Faktör Yapısının Yeniden İncelenmesi: Cinsiyet ve Öğrenim Görülen Program Türüne Göre Epistemolojik İnançların Karşılaştırılması". *Eğitim Araştırmaları Dergisi, 5*(18), 57–70

Dias, J. (2006). Model Selection for the Binary Latent Class Model: A Monte Carlo Simulation. *Data Science and Classification*, 91-99.

DPT, (2001). *Hayat Boyu Eğitim ve Örgün Olmayan Eğitim, Özel İhtisas Komisyon Raporu*. Ankara. European Commission (EC), (2003). Implementing Lifelong Learning Strategies in Europe:

Progress Report on The Follow-Up To The Council Resolution of 2002 on Lifelong Learning. Brussels. http://hdl.voced.edu.au/10707/105296 (Accessed on 14th July 2017)

European Commission (EC), (2007). *Key Competences for Lifelong Learning European Reference Framework*. file:///C:/Users/CBU1/Downloads/YiA%20Key%20Competences%20for%20Lifelong%20Learni ng%20-%20European%20Reference%20Framework%20(1).pdf (Accessed on 14th July 2017)

Ekinci, N. (2008). *Üniversite Öğrencilerinin Öğrenme Yaklaşımlarının Belirlenmesi ve Öğretme-Öğrenme Süreci Değişkenleri ile İlişkileri*. Doktora Tezi, Hacettepe Üniversitesi, Sosyal Bilimler Enstitüsü, Ankara.

Erdamar, G. (2011). *Eğitimde Yeni Yönelimler*. (Ed. Özcan Demirel), Ankara: Pegem Akademi.

Eurostat (2005). *Europe in Figures*. http://ec.europa.eu/eurostat/documents/3217494/5662531/KS-CD-05-001-EN.PDF/751b319f-9bec-4eab-8b55-4dec31789b23 (10 Aralık 2015 tarihinde erişildi.) (Accessed on 10th December 2017)

Figel, J. (2007). *Key Competences for Lifelong Learning-European Reference Framework*. Luxembourg: Office for Official Publicatios of the European Communities. file:///C:/Users/CBU1/Downloads/YiA%20Key%20Competences%20for%20Lifelong%20Learni ng%20-%20European%20Reference%20Framework.pdf (Accessed on 12th July 2017)

Gencel, E. İ. (2013). Öğretmen Adaylarının Yaşam Boyu Öğrenme Yeterliklerine Yönelik Algıları. *Eğitim ve Bilim Dergisi, 38*(170), 237-252.

Güleç, İ., Çelik, S. ve Demirhan B. (2012). Yaşam Boyu Öğrenme Nedir? Kavram ve Kapsamı Üzerine Bir Değerlendirme. *Sakarya University Journal of Education, 2*(3), 34-48.

Güler, B. (2004). *Avrupa Birliği'nin Yetişkin Eğitim Programı Grundtvig Çerçevesinde Halk Kütüphanelerinin Yeri ve Önemi*. Yüksek Lisans Tezi, Ankara Üniversitesi, Sosyal Bilimler Enstitüsü, Ankara.

Harpe, B. D. L., and Radloff, A. (2001). Informed Teachers and Learners: The Importance of Assessing the Characteristiics Needed for Lifelong Learning. *Studies in Continuing Education, 22*(2), 169-182.

Hart, R. (2006). *Using E-Learning to Help Students Develop Lifelong Learning Skills*. PhD Thesis, Royal Roads University.

Hürsen, Ç. (2011). *Öğretmenlerin Yaşam Boyu Öğrenme Yaklaşımına Yönelik Görüş-Tutum ve Yeterlik Algılarının Değerlendirilmesi*. Doktora Tezi, Yakın Doğu Üniversitesi, Eğitim Bilimleri Enstitüsü, Lefkoşa.

İzci, E. ve Koç, S. (2012). Öğretmen Adaylarının Yaşam Boyu Öğrenmeye İlişkin Görüşlerinin Değerlendirilmesi. *Adıyaman Üniversitesi Sosyal Bilimler Enstitüsü Dergisi, 5*(9), 101-114.

Karakuş, C. (2013). Meslek Yüksekokulu Öğrencilerinin Yaşam Boyu Öğrenme Yeterlikleri. *Eğitim ve Öğretim Araştırmaları Dergisi, 2*(3), 26-35.

Kavtelek, C. (2014). *Hayat Boyu Öğrenme Kurum Yöneticilerinin Hayat Boyu Öğrenmeye İlişkin Algıları ve Görüşleri*. Yayımlanmamış Yüksek Lisans Tezi, Cumhuriyet Üniversitesi, Eğitim Bilimleri Enstitüsü, Sivas.

Kesici, Ş., Şahin, İ., and Aktürk, A. O. (2009). Analysis of Cognitive Learning Strategies and Computer Attitudes, According to College Students" Gender and Locus of Control. *Computers in Human Behavior, 25*, 529–534.

Kılıç, Ç. (2014). Öğretmen Adaylarının Yaşam Boyu Öğrenmeye Yönelik Algıları. *Eğitim ve Öğretim Araştırmaları Dergisi, 3*(4), 79-87.

Kozikoğlu, İ. (2014). Üniversite ve Meslek Yüksekokulu Öğrencilerinin Yaşam Boyu Öğrenme Yeterliklerinin İncelenmesi. *Journal of Instructional Technologies and Teacher Education, 3*(3), 29-43.

Kirby, J. R., Knapper, C., Lamon, P., & Egnatoff, W. J. (2010). Development of A Scale to Measure Lifelong Learning. *International Journal of Lifelong Education, 29*(3), 291-302.

Leathwood, C., & Francis, B. (2006). *Gender and Lifelong Learning: Critical Feminist Engagements*. Routledge published.

Litzinger, T., Wise, J., Lee, S., Simpson, T., & Joshi, S. (2001). *Assessing Readiness for Lifelong Learning*. Proceedings of the 2001 American Society for Engineering Education Annual Conference and Exposition. file:///C:/Users/CBU1/Downloads/assessing-readiness-for-lifelong-learning.pdf (Accessed on 14th July 2017)

Loads, D. (2007). Effective Learning Advisers' Perceptions of Their Role in Supporting Lifelong Learning. *Teaching in Higher Education, 12*(2), 235-245.

Magidson, J., & Vermunt, J. K. (2001). Latent Class Factor and Cluster Models, Bi-plots, and Related Graphical Displays. *Sociological methodology, 31*(1), 223-264.

Magidson, J., & Vermunt, J. K. (2004). *Latent class models. The Sage handbook of quantitative methodology for the social sciences*, 175-198.

MEB. (2006). Öğretmenlik Mesleği Genel Yeterlikleri. Öğretmen Yetiştirme ve Eğitimi Genel Müdürlüğü. Ankara: MEB. http://otmg.meb.gov.tr/belgeler/otmg/Yeterlikler.pdf adresinden (Accessed on 14th July 2017)

Mwamwenda, T., S. (1992). Cognitive Development in African Children. *Genetic, Social and General Psychology Monographs, 118*(1).

Nylund, K. L., Asparouhov, T., & Muthén, B. O. (2007). Deciding on the Number of Classes in Latent Class Analysis and Growth Mixture Modeling: A Monte Carlo Simulation Study. *Structural equation modeling, 14*(4), 535-569.

Nicolaescu, C. (2012). Lifelong Learning: English Studied through Online Practices. Internaional Conference ICT for Language Learning 5th Edition, 3(4), 92.

Oral, B. ve Taha, Y. (2015). Öğretmen Adaylarının Yaşam Boyu Öğrenmeye İlişkin Algılarının Çeşitli Değişkenlere Göre İncelenmesi. *Elektronik Sosyal Bilimler Dergisi, 14*(52), 1-11.

Ödemiş, S. İ. (2014). Havacılık Teknolojileri ve Yaşam Boyu Öğrenme, *Uluslararası Sosyal Araştırmalar Dergisi, 7*(32), 512-519.

Özcan, D. and Uzunboylu, H. (2012). Perceptions of Principals towards Lifelong Learning. *Cypriot Journal of Educational Sciences, 7*(3), 148-157.

Ramaswamy, V., DeSarbo, W. S., Reibstein, D. J., & Robinson, W. T. (1993). An Empirical Pooling Approach for Estimating Marketing Mix Elasticities with PIMS Data. *Marketing Science, 12*(1), 103-124.

Selçuk, G. (2016). *Öğretmen Adaylarının Yaşam Boyu Öğrenme Yeterlik Algıları ve Öz-Yeterlik İnançlarinin Öğretmen Yetiştirme Programı Kapsamında İncelenmesi*. Doktora Tezi. Yakın Doğu Üniversitesi, Eğitim Bilimleri Enstitüsü, Lefkoşa.

Selvi, K. (2011). Öğretmenlerin Yaşam Boyu Öğrenme Yeterlilikleri. *Uluslararası Eğitim Programları ve Öğretim Çalışmaları Dergisi, 1*(1), 63.

Soni, S. (2012). Lifelong Learning-Education and Training. *Learning and Teaching Methodology*, 5945, 1-14.

Steffens, K. (2015). Competences, Learning Theories and MOOCs: Recent Developments in Lifelong Learning. *European Journal of Education, 50*(1), 41-59.

Sullivan, T. J. (2003). *Introduction to Social Problems*. Sixth Edition. Pearson Education. Boston.

Şahin, Ç. ve Arcagök, S. (2014). *Öğretmenlerin Yaşam Boyu Öğrenme Yeterlikleri Düzeyinin Çeşitli Değişkenler Açısından İncelenmesi*. Adıyaman Üniversitesi Sosyal Bilimler Enstitüsü Dergisi, 7(16), 394-417.

Şahin, M., Akbaşlı, S.ve Yanpar Yelken, T. (2010). Key Competences for Lifelong Learning: The Case of Prospective Teachers. *Educational Research and Review, 5*(10), 545-556.

Terzi, A. R., Şahan, H. H., Çelik, H. ve Zöğ, H. (2015). Öğretmen Adaylarının Epistemolojik İnançları ile Eleştirel Pedagoji İlkeleri Arasındaki İlişki. *Eğitim ve Öğretim Araştırmaları Dergisi, 4*(1), 344-356.

Teyfur, M. (2009). Eğitim Bilimine Giriş. Ankara: Anı Yayıncılık.

Toprak, M. ve Erdoğan, A. (2012). Yaşamboyu Öğrenme: Kavram, Politika, Araçlar ve Uygulama. *Yükseköğretim ve Bilim Dergisi, 2*(2), 69-91.

Tschannen-Moran, M., & Woolfolk Hoy, A (2001). Teacher Efficacy: Capturing an Elusive Concept. *Teaching and Teacher Education*, 17, 785–805.

Tunca, N., Alkın Şahin, S. ve Aydın, Ö. (2015). Öğretmen Adaylarının Yaşam Boyu Öğrenme Eğilimleri. *Mersin Üniversitesi Eğitim Fakültesi Dergisi, 11*(2), 432446.

Tuncer, M. ve Tanaş, R. (2011). Bilgisayar Programcılığı Öğrencilerinin Yaşam Boyu Öğrenme Becerilerinin Öğrenci ve Öğretim Elemanı Görüşlerine Göre Değerlendirilmesi: Tunceli Meslek Yüksekokulu Örneği. *KSU Sosyal Bilimler Dergisi, 8*(2), 119-131.

Uzunboylu, H., & Hursen, C. (2011). Lifelong Learning Competence Scale: The Study of Validty and Reliability. *Hacettepe Üniversitesi Eğitim Fakültesi Dergisi*, 41, 449-460.

Yavuz Konokman, G., and Yanpar Yelken, T. (2014). The Perceptions of Academicians in Education Faculties on Their Lifelong Learning Competencies. *Hacettepe Üniversitesi Eğitim Fakültesi Dergisi, 29*(2), 267-281.

Yıldırım, Z. (2015). *Sınıf Öğretmenlerinin Yaşam Boyu Öğrenmeye Yönelik Yeterlik Algıları ve Görüşleri*. Yüksek Lisans Tezi, Çanakkale Onsekiz Mart Üniversitesi, Eğitim Bilimleri Enstitüsü, Çanakkale.