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Abstract

Every individual is different from each other, and learning processes can also differ from each other. Therefore, individuals' learning styles may differ from other individual to individual. The purpose of this research is to investigate the learning styles of pre-service teachers in terms of gender, department and class level variables. The survey model, one of the non-experimental research designs, was used in the research. "Kolb Learning Style Inventory" was used as the data collection tool in the research. The sample of the research consists of 328 pre-service teachers who are studying in the 1st, 2nd, 3th and 4th class of elementary school teaching (n = 172) and mathematics teaching (n = 156). The data obtained by the Kolb Learning Style Inventory were analyzed using descriptive statistics and chi-square test. As a result of the findings, it was observed that the differentiation of pre-service teachers' learning styles according to their departments, genders and class levels was not statistically significant.

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Research Article**Examining the Learning Styles of Teacher Candidates in Terms of Different Variables ***Betül KÜÇÜK DEMİR¹  Demet DENİZ YILMAZ² **Abstract**

Every individual is different from each other, and learning processes can also differ from each other. Therefore, individuals' learning styles may differ from other individual to individual. The purpose of this research is to investigate the learning styles of pre-service teachers in terms of gender, department and class level variables. The survey model, one of the non-experimental research designs, was used in the research. "Kolb Learning Style Inventory" was used as the data collection tool in the research. The sample of the research consists of 328 pre-service teachers who are studying in the 1st, 2nd, 3th and 4th class of elementary school teaching (n = 172) and mathematics teaching (n = 156). The data obtained by the Kolb Learning Style Inventory were analyzed using descriptive statistics and chi-square test. As a result of the findings, it was observed that the differentiation of pre-service teachers' learning styles according to their departments, genders and class levels was not statistically significant.

Keywords: : Kolb learning style, learning, learning style, pre-service teacher

1. INTRODUCTION

Every individual is different from each other, and learning processes can also differ from each other. Therefore, individuals' learning styles may differ from other individual to individual. Özbay (2006) stated that students have different learning needs and styles, so students cannot benefit from educational activities equally. Knowing one's own learning style and engaging it in the learning process will help his/her learn quickly and be successful in this process (Biggs, 2001). When considered from another point of view, it is necessary for teachers to know the learning styles of their students in order to realize an effective learning and it becomes important.

The teacher, who knows the learning style of his student, can design an appropriate educational environment and teach. Individuals' learning styles may also vary according to age, gender, academic achievement, and culture (Özer, 1998). For this reason, individuals' learning style is not evaluated as good or bad, it can be said that they have different learning styles. Learning style; In addition to the similarities between people while learning and communicating with others, it is the style that affects the individual's individuality, the individual's use of different ways in preparation for learning, learning and remembering, while walking, playing, writing, sitting, at every moment and dimension of life (Vural, 2004). Many definitions of learning styles have been made. One of these is the ways that

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the individual will find his / her own in the process of receiving and processing information, made by Kolb (1987). In Kolb's learning model, the learning styles of individuals are in the form of a cycle and it can be determined where the individuals take place in this cycle. There are 4 learning styles in this cycle.

These are: "Concrete Experience", "Reflective Observation", "Abstract Conceptualization" and "Active Experimentation".

- "Feeling" for Concrete Experience,
- "Watching" for Reflective Observation,
- "Thinking" for Abstract Conceptualization,
- Learning by "doing" for Active Experimentation.

However, there is no single form that determines the learning style of the individual. Learning style of each individual is a component of these 4 basic forms. For this reason, it is placed in a learning situation by combining various situations. The most appropriate learning style is determined by the sum of the individual's scores. These learning styles are;

- *Accommodating *Assimilating *Diverging *Converging.

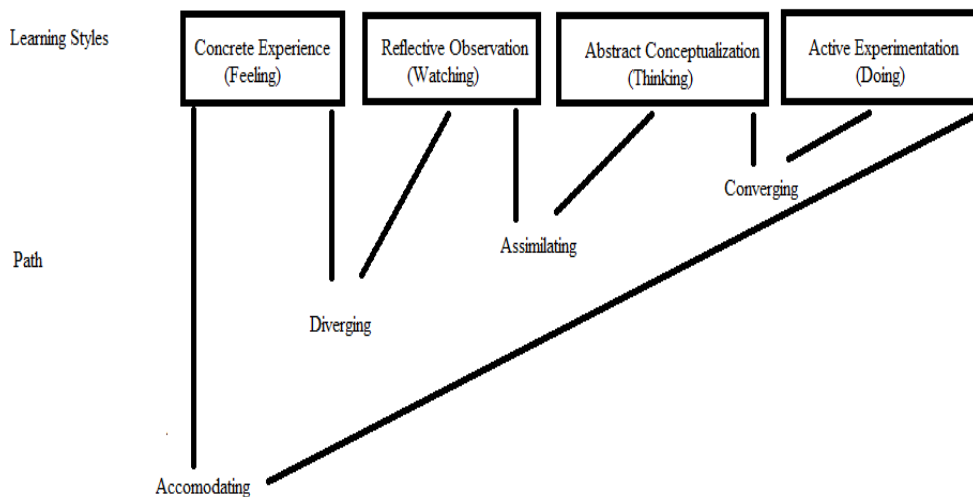


Figure 1. Kolb learning model

The characteristics of individuals with these learning styles are stated as follows. (Aşkar & Akkoyunlu, 1993; Ekici, 2003; Stice, 1987):

- **Converging:** It covers the forms of Abstract Conceptualization and Active Experimentation. Problem solving, decision making and logical analysis of ideas and systematic planning are its main features. Individuals involved in this learning style are successful in problem solving. The individual makes systematic planning while solving problems. Learning by doing is important.

- **Diverging:** It covers Concrete Experience and Reflective Observation. The most important feature is the ability to think, aware of values and meanings that is. In the learning situation, he/she is patient, objective, one who judges carefully but does not take any action. He/she takes into account his/her own thoughts and feelings while shaping his thoughts.

- **Assimilating:** It covers the Abstract Conceptualization and Reflective Observation. Creating conceptual models is its most distinctive feature. While learning things, he/she focuses on abstract concepts and ideas.

- **Accommodating:** It covers Concrete Experience and Active Experimentation. Planning, making decisions and taking part in new experiences are its main features. In the learning situation, individuals are open-minded and easily adapt to changes (Kolb, 1984). There is learning by doing and feeling.

Determining students' learning style and teaching in this direction provides a statistically significant increase in positive attitude towards teaching and academic achievement (Given, 1996). When considered from this point of view, it is of great importance for pre-service teachers who will train students to have knowledge about learning styles and to realize an educational environment that takes students' learning styles into account (Kılıç, 2002). In this context, in this study, it was aimed to reveal the learning styles of prospective teachers and to determine whether there is any differentiation according to gender, department and grade level.

2. METHOD

2.1. Research Model

Since the research aims to determine the learning styles of pre-service teachers in terms of different variables, the survey model, one of the non-experimental research designs, was used in this research. The survey model aims to describe a past or present situation as it is (Karasar, 2012).

2.2. Research Sample

In this research non-random sampling method, the convenience sampling method was used. The sample of the research consists of a total of 328 pre-service teachers who are researching in the first, 2nd, 3th and 4th class of classroom teaching (n=172) and mathematics teaching (n=156) departments at a state university.

2.3. Instrument

The "Kolb Learning Style Inventory" was used as the data collection tool. This inventory was created by Kolb (1985) and translated into Turkish by Aşkar and Akkoyunlu (1993). Inventory consists of 12 items and each item contains 4 options. Cronbach Alpha reliability coefficients of the inventory were determined as .58 for concrete experience, .70 for reflective observation, .71 for abstract conceptualization, .65 for active life, .77 for abstract-concrete, and .76 for active reflector. The lowest score that can be obtained from this scale is 12, and the highest score is 48. (Aşkar & Akkoyunlu, 1993).

2.4. Data Analysis

The data obtained by the Kolb Learning Style Inventory were analyzed using descriptive statistics and chi-square test. This technique tests whether two classified (categorical) variables are independent of each other. In other words, it is determined whether the groups differ in terms of the answers given (Büyüköztürk, 2002)

3. FINDINGS

In this section, findings related to the dominant learning styles of pre-service teachers and whether the dominant learning styles differ at the level of gender, department and class are presented.

Table 1. The dominant learning styles of pre-service teachers according to the departments they research

		Converging	Diverging	Assimilating	Accomodating	Total
Maths	N	43	35	25	53	156
	%	27.6	22.4	16	34	100
Science	N	39	37	44	52	172
	%	22.7	21.5	25.6	30.2	100
Total	N	82	72	69	105	328
	%	25	22	21	32	100

$$\chi^2=4,723 \quad df=3 \quad p=.193$$

Considering the distribution of pre-service teachers' learning styles according to the departments they research in, 27.6% of the pre-service teachers who have a converging learning style are in Mathematics Education, while 22.4% are in Science Teaching. While 22.4% of the pre-service teachers who have a diverging learning style are in Mathematics Education, 21.5% are in Science

Teaching. While 216% of the pre-service teachers with assimilating learning style were in Mathematics Teaching, 25.6% were in Science Teaching. While 34% of the pre-service teachers who have a accomodating learning style are in Mathematics Education, 30.2% are in Science Teaching. As a result of the χ^2 test conducted to determine whether this change in learning styles according to departments is statistically significant or not [$\chi^2 = 4.723$; $df = 3$; $p = .193 > .05$] it was found that there is no significant difference. In other words, the learning styles of the pre-service teachers do not differ according to their departments.

Table 2. Dominant learning styles of pre-service teachers according to class levels

		Converging	Diverging	Assimilating	Accomodating	Total
1.Class	N	23	19	16	40	98
	%	23.5	19.4	16.3	40.8	100
2.Class	N	16	19	12	26	73
	%	21.9	26	16.4	35.6	100
3.Class	N	18	17	19	23	77
	%	23.4	22.1	24.7	29.9	100
4.Class	N	25	17	22	16	80
	%	31.3	21.3	27.5	20	100
Total	N	82	72	69	105	328
	%	25	22	21	32	100
$\chi^2=12,791$		$df=3$	$p=.172$			

Considering the distribution of pre-service teachers' learning styles according to their class levels, 23.5% of pre-service teachers who have a converging learning style are first class, 21.9% are 2nd class, 23.4% are 3th class and 31.3% is researching in the 4th class. Of the pre-service teachers with a diverging learning style, 19.4% were in the first class, 26% were in the 2nd class, 22.1% were in the 3th class, and 21.3% were in the 4th class. 16.3% of the pre-service teachers with assimilating learning style research in the first class, 16.4% in the 2nd class, 24.7% in the 3th class and 27.5% in the 4th class. On the other hand, 40.8% of the pre-service teachers who have a accomodating learning style research in the first class, 35.6% in the 2nd class, 29.9% in the 3th class and 20% in the 4th class. It was determined whether this change seen in learning styles according to the class levels studied was statistically significant. [$\chi^2=12,791$; $df=3$; $p=.172 > .05$]. In other words, the learning styles of the pre-service teachers do not differ according to their class levels.

Table 3. Dominant learning styles of pre-service teachers by gender

		Converging	Diverging	Assimilating	Accomodating	Total
Female	N	57	52	47	76	232
	%	24.6	22.4	20.3	32.8	100
Male	N	25	20	22	29	96
	%	26	20.8	22.9	30.2	100
Total	N	82	72	69	105	328
	%	25	22	21	32	100
$\chi^2=.502$		$df=3$	$p=.918$			

Considering the distribution of pre-service teachers' learning styles by gender variable, 24.6% of the pre-service teachers who have a Converging learning style are female, while 26% are male. While 22.4% of pre-service teachers with a Diverging learning style are female, 20.8% are male. While 20.3% of the pre-service teachers with assimilating learning style are female, 22.9% of them are male. While 32.8% of the pre-service teachers with the Accomodating learning style are female, 30.2% are male. As a result of the χ^2 test performed to determine whether this change in learning styles

according to gender variable is statistically significant or not [$\chi^2 = .502$; $df = 3$; $p = .918 > 0.05$] it was found that there is no significant difference. In other words, the learning styles of pre-service teachers do not differ according to their gender.

4. DISCUSSION and CONCLUSION

According to the findings obtained from the learning styles preferred by the pre-service teachers according to the departments they research in, it was determined that the mathematics pre-service teachers mostly used accomodating learning style and the least assimilating learning style, and when the science pre-service teachers were examined, they used the most accomodating learning style and the least Diverging learning styles. In their research, [Aşkar and Akkoyunlu \(1993\)](#), who conducted studies to translate the Kolb learning style inventory into Turkish, collected data from 103 adults and found that the participants used the learning style that was the most assimilating and the least accomodating. In his research, [Ekici \(2013\)](#) found that according to the findings he obtained from students researching in different departments, pre-service teachers preferred the most diverging learning style and the least assimilating learning style. [Kaf-Hasırcı \(2006\)](#), in his research investigating the dominant learning styles preferred by classroom teacher students, determined that pre-service teachers preferred the most assimilating learning style as the least accomodating learning style. The researches conducted on the shaping of the learning styles of individuals, psychological characteristics, areas of specialization, professions; reveals that factors such as their work and adaptability are effective ([Aşkar & Akkoyunlu, 1993](#); [Gregorc & Butler, 1984](#); [Kolb, Boyatsız & Mainemelis, 2000](#); [Kolb & Kolb, 2005](#)).

Another finding obtained in the research is that the learning styles of prospective teachers do not differ according to their gender. [Altun and Yılmaz \(2016\)](#) could not find a significant difference between learning styles and gender in their research with mathematics pre-service teachers. Similarly, [Özsoy, Yağdıran and Öztürk \(2004\)](#) conducted a research with 2ndary education students and found that there was no statistically significant relationship between learning styles and gender in their research. There are studies in the literature that support the findings of our research ([Akgün, 2002](#); [Can, 2011](#); [Güneş, 2004](#); [Köseoğlu, 2009](#); [Özgür, 2013](#)). When the studies investigating the learning styles and gender relationship are examined, it is seen that different results have been reached. In some studies with samples of university students and adults, it has been revealed that there are significant relationships between learning styles and gender. ([Davis, 1998](#); as cited from [Severines and Dam, Whitcomb, 1999](#); [White, 1994](#); [Tuncer, Dikmen, & Akmençe, 2018](#)). Another finding obtained from the research is that it is not statistically significant for pre-service teachers to differentiate their learning styles according to class level. [Özgür \(2013\)](#) found in his research with Böte students that class level was not effective in learning style preferences. Similarly, [Arsal and Özen \(2007\)](#) and [Kaf-Hasırcı \(2006\)](#) stated in the research they conducted with classroom teacher students that class level had no effect on learning style preference. On the contrary, [Durdukoca and Arıbaş \(2010\)](#) found that class level makes a significant difference in learning style preference. It may be suggested that prospective teachers who will train future students should be aware of their students' learning styles and plan by considering their learning styles while organizing their learning environments. While determining the dominant learning styles preferred by students, studies can be conducted to look at the effects of different variables.

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