

Analyzing the Learning Styles of Pre-Service Primary School Teachers¹

Muhammet Özdemir¹ Fitnat Kaptan²
1.Eregli Faculty of Education, Bulent Ecevit University
2.Faculty of Education, Hacettepe University

Abstract

The purpose of this research is to analyze the learning styles of pre-service primary school teachers by various variables. The universe of the research is composed of 2136 pre-service primary school teachers study in freshman (first year) and senior (fourth year) classes of Faculty of Education School Teaching department in Gazi University, Kırıkkale University, Ahi Evran University, Zonguldak Karaelmas University and Kafkas University in 2008-2009 academic year spring semester. Totally 1124 pre-service primary school teachers as 694 (61.74%) of them are females and 430 (38.25) of them are males have composed the sampling of the research as well. The research is realized by using the survey model because of purposing to analyze the learning styles of pre-service primary school teachers by various variables. Kolb Learning style scale is used for determining the learning styles of the pre-service primary school teachers in research. The analysis of the data obtained from the result of applying the measure tool is made by SPSS 15 statistics program. According to the results of the research that the least preferred learning style is described as accommodating when converging the dominant learning styles of pre-service primary school teachers.

Keywords: The Learning Styles, Kolb Learning Style, Pre-service primary school teachers.

1. Introduction

Learning is slightly permanent tracks changing in potential behavior or behaviors resultant as the life experiment which will not be attributed to growth and temporary changing occurred by different effects (Senemoğlu, 2004). Learning theoreticians analyze the learning as 'how' to learn the 'which' material. 'Which' concerns the content of the material specifically. 'How' analyzes the climate, personal factors, intelligence, reinforcements, teaching strategies and biological factors (Ross, Drysdale and Schulz, 2001).

Personal differences are one of the factors affect the individual except for the factors that theoreticians analyze when the learning is realizing. The researches about educational sciences reveal that there are learning differences between students and completely learning can only occur by finding the best learning method for the person, organizing the learning environment as this. These learning differences between the students are transformed into a conception moves the individual differences of students and personalization the education in teaching process to center.

Mutlu and Aydoğdu (2003) mentioned that one of the most important term is the learning style terms to state the individual difference. Again they mentioned that if the learning styles of individuals are determined, the educators can organize special education experiences for person fits these styles and so the individuals become more successful. Guastello (1998) and Ekici (2003) indicate that one of the most important components of the education process is the learning style although it is not the only factor of occurring the learning at different levels. Cano-Garcia and Hughes (2000) mentioned that the learning styles in cognitive processes are in key position for structuring the learning also.

Each student has different learning styles based on their individual characteristics. The learning styles are defined by Keefe (1979) as the cognitive, affective and psychological behaviors show how the individuals perceive and interact with the learning environments and how they react there as well. Dunn (1993) stated in his Personally Identifiable Learning Model that the learning styles as 'There are a large variety of learning and teaching. Everybody can learn but cannot teach in the same way. A learning style is not existed fits for all children. The best way for everybody learning must be generated and made easy to go along there. Finding the learning style of a student and organizing the necessity arrangements increase the success of the student'. According to Kolb, the learning style is the preferred method for getting and processing the information personally (Kolb, 1984: 24-29).

Clearly seen when reviewing the researches about learning styles that too many researches based on Kolb learning style have existed. Kolb learning style model (experiential learning) is different from other learning styles and personality tests used in education because of moving through a large theory in learning and developing. The experiential learning hypothesis is developed by the 21st-century scientists (John Dewey, Kurt Lewin, Jean Piaget, William James, Carl Jung, Paulo Freire, Carl Rogers) who gives an important role to experience for learning and developing the person (Kolb and Kolb, 2005a).

¹ This article is derived from a dissertation.

Learning occurs as a result of the conflicts between transformation and comprehension dimensions which are basically two dialectical opponent dimensions according to the experiential learning model. These dimensions are explained below.

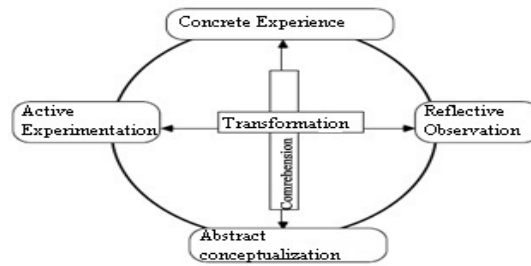


Figure 1. Experiential Learning Model (Kolb, 1984: 42)

1-Comprehension Dimension: Concrete experience with abstract conceptualization are on the tips of vertical continuity line and show the community, perception preferences of experiences of the individual. (Kolb, 1984).

2-Transformation Dimension: Reflective observation and active experimentation are on horizontal continuity line as well. It is the transformation of the experience via reflective observation and active experimentation (Kolb, 1984).

Improvement in experiential learning is described by three parts:

- (1) Acquisition: Includes the improvement of basic skills and cognitive structures from birth to adulthood.
- (2) Specialization: It is the period includes the time from formal training to early business life and personal experience in adulthood. There is a close relationship between the learning styles and environmental expectations. The social sphere is in the tendency to change the characteristic features of learning style, but the individuals are in the tendency to choose the compatible sphere (environment) with their own learning styles. Social, educational and organizational socializing shape the special learning style by a specific improvement.
- (3) Combination: Includes the middle of person's career and the periods of life after. (Kolb and Kolb, 2005a, 2008).

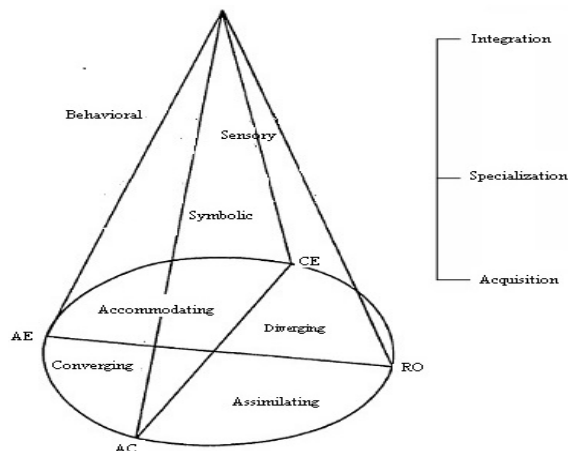


Figure 2. Growth and Improvement by the Experiential Learning Theory of Kolb.

(Kolb and Kolb 2005a; Kolb and Kolb, 2008)

According to the Figure 2, improvement of the person continues as the result of interacting the dimensions of concrete experience, reflective observation, abstract conceptualization and active experimentation with each other. Improvement continues based on the dominant learning style with the lifestyle (sensual complication increases by the concrete experience dimension, perceptual complication increases by the reflective observation dimension, figurative complication increases by the abstract conceptualization dimension and the behavioral complication increases by the active experimentation dimension) (Kolb and Kolb 2005a; Kolb and Kolb, 2008).

Kolb created four quarters with the angles between comprehension and transformation dimensions. The main thought in here is realizing the learning as long as some transformations and transfers between experiences and presenting the experiences formal or conceptual. Kolb summarizes the learning styles as the Figure.3 (Gencel, 2006).

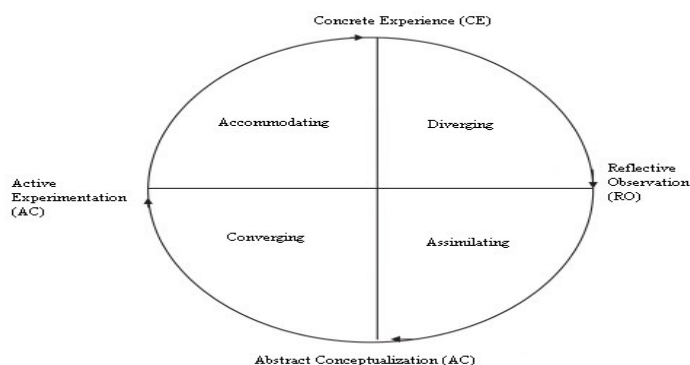


Figure 3. Experiential Learning Cycle of Kolb and Basic Learning Styles

The learning styles of the individuals are as a cycle in the learning style model of Kolb. There are 4 types of learning styles. These are Concrete Experience, Reflective Observation, Abstract Conceptualization and Active Experimentation. According to Kolb, the learning process has two basic dimensions. First of them runs from abstract conceptualization to concrete experience, second of them runs from active experimentation to reflective observation. The concrete experience and abstract conceptualization explain how the individual perceives the knowledge; reflective observation explains how the individual processes the knowledge as well. Preferences of each individual about learning methods are different from each other. These are firstly 'learning by feeling' for concrete experience, 'learning by watching' for reflective observation, 'learning by thinking' for abstract conceptualization and 'learning by doing' for active experimentation (Kolb, 1984).

1.1 The Learning Styles in Experiential Learning Hypothesis of Kolb

1.1.1 Diverging: Active experimentation and reflective observation learning skills are predominant. Diverging individuals are emotional and have creative thinking, big imagination also. They look at certain circumstances by different viewpoints (Kolb et al, 2001; Garci and Hughes, 2000; Cassidy, 2004; Mestre, 2006; Orhun, 2007; Kolb and Kolb, 2008; Gürsoy, 2008). Most important characteristics of these individuals are their awareness about thinking skill, meaning, and values. Moreover, they review the concrete situations on several counts, organize the relations significantly. Emphasized the orienting by watching rather than action. These individuals make judgement as patient, objective careful for learning condition; but abstain from doing an action either. They consider their own opinions when shaping the thoughts. The reason for calling this style as Diverging is the individuals have this style show better performance in circumstances they need to create alternative thoughts like in brainstorm than other individuals who have other learning styles (Kolb, 1984; Peker, 2003). The individuals who have diverging learning style have imagination and being sensitive for emotions abilities to be effective in jobs like art or service. But slogging when making a choice on, having difficulties during decision, remaining incapable of utilizing the opportunities occasionally are some of their weaknesses as well. These individuals need to improve their risk-taking abilities in their works and do new things by being based on the thought as the learning is a trial and error process, target by deciding what they want to success at the end of the learning process, decide by exerting oneself for choosing between the options and applying (Kolb, 1984).

1.1.2 Assimilating: The abstract conceptualization and reflective observation are the predominant learning skills. The assimilating ones learn by watching and thinking, organize well and make plans. Their best characteristic is shaping the sorted extensive knowledge as short and rational. There is a need for situations to ensure them to create theories. The assimilating ones prefer to observe in learning. These individuals are interested in abstract issues, ideas and terms more than people and social issues. They generally notice the reasonable voice of theories more than their application values. The individuals who have assimilating learning style prefer to read and examine the analytical models and need time to think.

1.1.3 Converging: The abstract conceptualization and active experimentation are the predominant learning skills. Most important characteristics of these individuals are problem-solving, decision, applying the ideas in practice, making analytics of ideas and systematic designing. Personality type in Myers and Briggs of converging learning style is extrovert thinking. The abilities of converging learning style is related to the decision abilities: quantitative analysis, using technology and setting objectives. Their best characteristics are finding a practical use for thoughts and theories. The teacher should allow students to study on the problem by doing and experiencing for making easier the learning environment. They decide based on the results of answers or problems they handled (Kolb, 1984; Ergür, 1998; Kolb et al, 2001; Peker, 2003; Kolb and Kolb, 2005).

1.1.4 Accommodating: The learning abilities of concrete experience and active experimentation are predominant. Most important characteristics are doing something, making plans and being included in new experiences. Taking a risk and actioning are emphasized in this style. The reason for calling this style as accommodating is the individuals have this style are the optimal ones for the circumstances against changing they have to adapt on

their own. These individuals give up the plan or the theory at worst if this plan or theories are unrealistic. They rely people on for knowledge rather than their own analytics abilities and again they are in a tendency to solve the problem in an emotional trial and error condition. These accommodating ones get in contact with people easily, but sometimes they look like impatient. They are open minded and adapt for changing easily in learning. Learning by feeling and doing by their manipulative skills come into question. Being fixer, leadership and taking risk are the most powerful sides of these individuals; doing nonsense activities, cannot finish the work on time, making impractical plans and not to being target-driven are the weaknesses as well (Kolb, 1984; Peker, 2003; Kolb and Kolb, 2005). These individuals need to create working opportunities with assimilating individuals for focusing on the useful sides of issues in long term instead of most important sides. It is thought that this learning style will be helpful for the jobs like transaction-driven marketing and sales (Kolb, 1985).

The position and importance of individual differences and individual learning in education start to come into prominence during the recent years. The reason of this could be explained via results of the researches about student's education based on their individual differences. That's why the learning styles of students and education environments established by teachers by considering the learning styles of the students become significant. Teachers by looking at their own individual learnings when they plan the education environments. Taking into account all of these, analyzing the learning styles of teachers and learning styles of teachers at primary school level gain importance in terms of organizing the education by individual differences and increasing the success as a result of these arrangements.

Commonly used inventory for determining the learning styles is the Learning Styles Inventory of Kolb. The Learning Styles Inventory of Kolb is used in this research to determine the learning styles of pre-service primary school teachers. The purpose of the research due to these reasons is to determine the predominant learning styles of teachers and analyze by various variables.

The subproblems of the research are;

1. How are the learning style distributions of the pre-service primary school teachers?
2. How are the predominant learning styles of the pre-service primary school teachers in comparison with the class level?
3. How are the predominant learning styles of the pre-service primary school teachers in comparison with the gender?

2. Method

This research has the characteristics of the survey model. The reason of this is trying to determine the relation between the predominant learning styles of pre-service primary school teachers who study in freshman and senior of Primary Education School Teaching Department of five different universities. The survey model is a research approachment aims to describe a model in past or present as it is (Balçı, 2001, Karasar, 2004). The subjected issue, person or object is tried to describe in its own rules and as it is also.

2.1. Sample

The target population of this research is all freshman and senior pre-service teachers in the department of primary school in Turkey.

The number of students is sampling is 2136. The number of attenders for research is 1560. Determined that the pre-service teachers do not complete the inventories in the direction of instructions applied for collecting data in research. Consequently, the sampling of the research is composed of 1124 pre-service teachers. The distributions of pre-service primary school teachers in research (sampling) by universities are shown in Table 1.

Table 1. Distribution of the pre-service primary school teachers in research group by the universities they study in

Universities	N	Percentage (%)
Gazi University	366	32,6
Ahi Evran University Kırıkkale University	431	38,3
Kafkas University Zonguldak Karaelmas University	327	29,1
Total	1124	100

According to table 1, 366 (32,6%) pre-service teachers in the department of primary school teacher teaching programme at Gazi University, 431 (38,3%) pre-service teachers in the department of primary school teacher teaching programme at Ahi Evran University and Kırıkkale University and 327 (29,1%) pre-service

teachers in the department of primary school teacher teaching programme at Zonguldak Karaelmas University and Kafkas University constitute of the study sample.

The distribution of pre-service primary school teachers in research group by universities and classes they study in is shown in Tablo 2.

Table 2. The distribution of pre-service primary school teachers in research by year of study they study in

Universities	Freshman		Senior	
	N	Percentage (%)	N	Percentage (%)
Gazi University	201	17,9	165	14,7
Ahi Evran University Kırıkkale University	213	19	218	19,3
Kafkas University Zonguldak Karaelmas University	169	15	158	14
	583	51,7	541	48,3
Total	1124	100	1124	100

According to the table 2; 201 (17,9%) students from freshman, 165 (14,7%) students from senior from department of primary teacher teaching programme of Gazi University attended to the research. 213 (19%) students from freshman and 218 (19,3%) students from senior from Ahi Evran and Kırıkkale University attended to the research. 169 (15%) students from freshman and 158 (14%) students from senior from Kafkas and Zonguldak Karaelmas Universities attended to the research.

The distribution of pre-service primary school teachers in research group by gender is shown in Table 3. Table 3. Distribution of pre-service primary school teachers in research by their gender.

Gender	N	Percentage (%)
Female	694	61,7
Male	429	38,3

According to the table 3, 694 (61,7%) female pre-service primary school teachers and 429 (38,3%) men pre-service primary school teachers attended to the research. Most of the attenders are composed of the female attenders.

2.2 Data Collection Tool

Learning Style Inventory of Kolb that is created based on Experiential Learning Hypothesis by Kolb is used as the data collection tool in research (KÖSE 3.1). Learning Style Inventory of Kolb took its final form by reviewing 5 times between 1976–2005 years. Two thousand eight (2008) researches in fields of education, management, computer sciences, psychology, medicine, nursing, accounting, law by using KÖSE (Learning Style Inventory of Kolb) were prepared between 1971–1999 years (Kolb and Kolb, 2005). There are reliability coefficients belong to a pilot study of scale by the researcher.

Table 4. KÖSE 3.1 Reliability Coefficients

Learning Styles	N	Cronbach-alfa
Concrete Experience	305	0,76
Reflective Observation	305	0,78
Abstract Conceptualization	305	0,81
Active Experimentation	305	0,77
Abstract Conceptualization- Concrete Experience	305	0,78
Active Experimentation- Reflective Observation	305	0,80

3. Findings

Findings based on subproblems of the research are below.

Findings for First Sub Problem

KÖSE 3.1 (Learning Style Inventory of Kolb) is applied in pre-service primary school teachers to test the first subproblem what is stated like ‘How is the distribution of learning styles of pre-service primary school teachers?’. Percentage frequency distribution obtained from applied scale is shown in Table 5.

Learning Style	Frequency	%
Converging	456	40,6
Assimilating	284	25,3
Diverging	201	17,9
Accommodating	183	16,3
TOTAL	1124	100,0

Seen when reviewing table 5 that 456 (40,6%) of pre-service primary school teachers in research have converging learning style , 284 (25,3%) of them have assimilating learning style, 201 (17,9%) of them have diverging learning style and 183 (16,3%) of them have accommodating learning style.

Findings for Second Sub Problem

KÖSE 3.1 (Learning Style Inventory of Kolb) is applied in pre-service primary school teachers to test the second subproblem what is called ‘How are the predominant learning styles of pre-service primary school teachers in comparison with the class level?’. Percentage frequency distribution of data obtained from applied scale is shown in Table 6.

Table 6. Learning Styles by Class Levels

Learning Style	Year of Study			
	Freshman	%	Senior	%
Converging	252	43,22	204	37,7
Assimilating	196	33,61	88	16,26
Diverging	79	13,5	122	22,55
Accommodating	56	9,65	127	23,47
Total	583	100	541	100

Determined when reviewing the table 6 that predominant learning styles of two hundred and fifty two (43,22%) of pre-service primary school teachers from freshman are converging, a hundred and ninety-six of them is assimilating, seventy-nine of them diverging, sixty-five of them is accommodating. Determined when reviewing senior students predominant learning style distribution in Table 6 that two hundred and four (37,7%) of them have diverging learning style, one hundred twenty-seven (23,47%) of them have accommodating, one hundred twenty-two (22,55%) of them have diverging and eighty-eight (16,26%) of them assimilating learning style.

Findings for Third Sub Problem

KÖSE 3.1 (Learning Style Inventory of Kolb) is applied in pre-service primary school teachers to test the third subproblem what is called ‘How are the predominant learning styles of pre-service primary school teachers by gender?’. Percentage frequency distribution of data obtained from applied scale is shown in Table 7.

Table 7. Learning Styles by Gender

Learning Style	Gender			
	Female	%	Male	%
Converging	293	42.23	163	37.90
Assimilating	179	25.79	105	24.41
Diverging	119	17.14	82	19.06
Accommodating	103	14.84	80	1.60
Total	694	100	430	100

Determined by reviewing the table 7 that 293 (42.23%) of female pre-service primary school teachers have converging predominant learning style, 179 (25.79%) of them have assimilating, 119 (17.14%) of them diverging and 103 (14.84%) of them accommodating learning style. Determined by reviewing the table 7 for male pre-service primary school teachers that 163 (37.90%) of them have converging predominant learning style, 105 (24.41%) of them have assimilating, 82 (19.60%) of them have diverging and 80 (18.60%) of them have accommodating learning styles.

4. Discussion

Founded by looking at the results of the research for freshman students that 252 (43,22%) of them have converging predominant learning style, 196 (33,61%) of them have assimilating predominant learning style, 79 (13,5%) of them diverging predominant learning style and 56 (9,65%) of them have accommodating predominant learning style. There are researches which have the similar results in literature (Hasırcı and Bulut, 2007; Numanoğlu and Şen, 2007; Demir, 2008; Denizoğlu, 2008; Deryakulu, Büyüköztürk and Özçınar, 2010; Bahar and Sülün, 2011). Most predominant learning styles in some researches are assimilating, converging, diverging and accommodating (Kılıç, 2002; Çağiltay and Tokdemir, 2004; Çaycı and Ünal, 2007; Güven and Kürüm, 2008; Deryakulu, Büyüköztürk and Özçınar, 2009; Durdukoca and Arıbaş, 2010; Karademir and Tezel, 2010; Gürsoy, 2010).

Founded by looking at the results of the research for senior students that 204 (37,7%) of them have converging predominant learning style, 127 (23,47%) of them accommodating predominant learning style, 122 (22,55%) of them have diverging predominant learning style and 88 (16,26%) of them have assimilating predominant learning style. When reviewing the researches about the predominant learning styles of senior pre-service primary school teachers, seen that there are similar results obtained from the researches by Yıldırım (2007), Laeeq et al. (2009). According to these results, the predominant learning style of pre-service primary school teachers in freshman and senior is converging learning style. When reviewing the second predominant learning styles, seen that freshman students have assimilating style while senior students have accommodating style. When reviewing the third predominant learning styles of pre-service primary school teachers, seen that both classes have diverging learning style. Minimum number of learning styles for pre-service primary school teachers are accommodating style for the freshman and assimilating style for the senior.

Determined by reviewing the results of the researches by gender of the female pre-service primary school teachers that 293 (42.23%) of them have converging predominant learning style, 179 (25.79%) of them have assimilating, 119 (17.14%) of them have diverging and 103 (14.84%) of them have accommodating predominant learning style. Determined by reviewing the results of the researches by gender of the male pre-service primary school teachers that 163 (37.90%) of them have converging predominant learning style, 105 (24.41%) of them have assimilating, 82 (19.60%) of them have diverging and 80 (18.60%) of them have accommodating predominant learning style.

The learning styles of the individuals are determined by the learning style inventory of Kolb. Kolb and Kolb (2005) classified the learning styles of individuals in different countries by study fields. According to the classification that individuals who study in art, history and psychology have diverging, individuals who study in architecture, literature and law have assimilating, individuals who study in engineering and medicine have converging, individuals who study in agriculture, education and communication have accommodating learning styles. The most common predominant learning style is converging ones with 456 pre-service primary school teachers (40,6%). The study fields of individuals who have converging learning style are medicine and engineering by classification of Kolb and Kolb (2005a, 2005b). The predominant learning style of individuals who study in education is accommodating. Clearly seen that 183 (16,3%) of pre-service primary school teachers have accommodating predominant learning style

Joy and Kolb (2009) mentioned that there are significant differences between the points determine the learning styles of individuals in the analysis of comparative researches by KÖSE in samplings in different countries. They've stated that these results explain the effect of the culture on learning. According to Joy and Kolb (2009), the learning style points are effected by the specialization stage of improvement. The specialization includes the period from formal education to first years in business life. The predominant learning styles of final year students are effected by specialization.

Yamazaki and Kayes (2005); Joy and Kolb (2009) mentioned that there could be differences in points of abstract conceptualization, concrete experience, and active experimentation, reflective observation by the culture of the sampling. It could be said that the points provide to determine the predominant learning styles of Turkish students are effected by the cultural differences.

References

- Bahar, H. ve Sülün, A. (2011). Fen Bilgisi öğretmen adaylarının öğrenme stilleri, cinsiyet öğrenme stili ilişkisi ve öğrenme stiline göre akademik başarı. *Kastamonu Eğitim Dergisi*, 19 (2), 379-386.
- Balcı, A. (2001). *Sosyal Bilimlerde Araştırma Yöntem, Teknik ve İlkeler*. Ankara: Pegem A, Yayınevi.
- Cano-Garcia, F. and Hughes, E. (2000). Learning and thinking styles: An analysis of their interrelationship and influence on academic achievement. *Educational Psychology*, 20(4), 413-430.
- Cassidy, S. (2004). Learning Styles: An overview of theories, models, and measures. *Educational Psychology*, 24 (4),419-444.
- Çağiltay, N. E. ve Tokdemir, G. (2004, 20-21 Mayıs). Mühendislik Eğitiminde Öğrenme Stillerinin Rolü, I. Ulusal Mühendislik Kongresinde sunuldu, İzmir.
- Çaycı, B. ve Ünal, E. (2007). Sınıf öğretmeni adaylarının sahip oldukları öğrenme stillerinin çeşitli değişkenlere göre incelenmesi. *Üniversite ve Toplum*. Web: http://www.universite-toplum.org/pdf/pdf_UT_328.pdf adresinden 25 Temmuz 2008'de alınmıştır.
- Demir, T. (2008). Türkçe Eğitimi Bölümü öğrencilerinin öğrenme stilleri ve bunların çeşitli değişkenlerle ilişkisi (Gazi Üniversitesi Örneği). *Uluslararası Sosyal Araştırmalar Dergisi*, 1,(4), 129-148.
- Denizoğlu, P. (2008). Fen Bilgisi Öğretmen Adaylarının Fen Bilgisi Öğretimi Öz-Yeterlik İnanç Düzeyleri, Öğrenme Stilleri Ve Fen Bilgisi Öğretimine Yönelik Tutumları Arasındaki İlişkinin Değerlendirilmesi, Yayımlanmamış Yüksek Lisans Tezi, Çukurova Üniversitesi Sosyal Bilimler Enstitüsü, Adana
- Deryakulu, D., Büyükoztürk, Ş. ve Özçınar, H. (2010). Predictors of academic achievement of student ICT teachers with different learning styles. *International Journal of Human and Social Sciences*, 5-9.
- Dunn, R. and Dunn K. (1993). Learning Styles of The Multiculturally Diverse, *Emergency Librarian*, 20 (4), 24-33.
- Durdukoca, Ş. ve Arıbaş, S. (2010, 20 -22 Mayıs). İnönü Üniversitesi Eğitim Fakültesi Sınıf Öğretmenliği Öğretmen Adaylarının Sahip Oldukları Öğrenme Stillerinin Farklı Değişkenlere Göre Değerlendirilmesi. 9. Ulusal Sınıf Öğretmenliği Eğitimi Sempozyumunda sunuldu, Elazığ.
- Ekici, G. (2003). *Öğrenme Stiline Dayalı Öğretim ve Biyoloji Dersi Öğretimine Yönelik Ders Planı Örnekleri*. Ankara: Gazi Kitabevi.
- Ergür, D. O. (1998). Hacettepe Üniversitesi Dört Yıllık Lisans Programlarındaki Öğrenci ve Öğretim Üyelerinin Öğrenme Stillerinin Karşılaştırması, Hacettepe Üniversitesi Sosyal Bilimler Enstitüsü, Ankara.
- Garcia, F., C. and Hughes, E., H. (2000). Learning and Thinking Styles: An Analysis of Their Interrelationship and Influence on Academic Achievement. *Educational Psychology*, 20 (4).
- Gencel, İ. E. (2006). Öğrenme Stilleri, Deneysel Öğrenme Kuramına Dayalı Eğitim, Tutum ve Sosyal Bilgiler Program Hedeflerine Erişi Düzeyi, Yayımlanmamış Doktora Tezi, Dokuz Eylül Üniversitesi, Eğitim Bilimleri Enstitüsü, İzmir.
- Guastello, E.F. (1998). Reliability and concurrent validity of global learning style assessment for elementary school students (Grade 2-5). Unpublished Doctoral Thesis. St. John's University, New York.
- Gürsoy, T. (2008). Öğretmen Adaylarının Öğrenme Stillerinin Çeşitli Değişkenler Açısından İncelenmesi, Yayımlanmamış Yüksek Lisans Tezi, Adnan Menderes Üniversitesi Sosyal Bilimler Enstitüsü, Aydın.
- Güven, M. ve Kürüm, D. (2008). Öğretmen adaylarının öğrenme stilleri ile eleştirel düşünme eğilimleri arasındaki ilişki (Anadolu Üniversitesi), *İlköğretim Online*, 7 (1), 53-70. Web: <http://ilkogretim-online.org.tr/vol7say1/v7s1m5.pdf> adresinden 18 Aralık, 2009'da alınmıştır.
- Hasırcı, Ö. ve Bulut, M., S. (2007). Öğretmen adaylarının öğrenme stillerinin öğretim stillerine etkisi, *Çukurova Üniversitesi Eğitim Fakültesi Dergisi*, 3 (33).
- Joy, S. and Kolb, D. (2009). Are There Cultural Differences in Learning Style?. *International Journal of Intercultural Relations*, 33, 69-85
- Karademir, E. ve Tezel, Ö. (2010). Sınıf Öğretmeni Adaylarının Öğrenme Stillerinin Demografik Değişkenler Açısından İncelenmesi, *Pamukkale Üniversitesi Eğitim Fakültesi Dergisi*, 28, 129-145.
- Karasar, N. (2004). *Bilimsel Araştırma Yöntemi*. Ankara: Nobel Yayın Dağıtım.

- Keefe, J. W. (1979). Learning style: An overview. In Student learning styles: Diagnosing and Prescribing Programs. Reston: National Association of Secondary School Principals.
- Kılıç, E. (2002). Baskın öğrenme stiline göre öğrenme etkinlikleri tercihi ve akademik başarıya etkisi. *Eğitim Bilimleri ve Uygulama*, 1 (1), 1-15.
- Kolb, D. (1984). *Experiential Learning: Experience as the Source of Learning and Development*. New Jersey: Prentice Hall.
- Kolb, D. (1985). *Learning Style Inventory: Self Scoring Inventory and Interpretation Booklet*. Boston: McBer and Company.
- Kolb, D., A., Boyatzis, R. and Mainemelis, C. (2001). Experiential Learning Theory: Previous Research and New Directions, Previous research and new directions. In Sternberg R. J., and Zhang L. F., Perspectives on cognitive, learning, and thinking styles. (Eds.). Mahwah: Lawrence Erlbaum Associates Inc.
- Kolb, A. and Kolb, D. (2005a). *The Kolb Learning Style Inventory—Version 3.1 2005 Technical Specifications*. Experience Based Learning Systems, Inc. Boston, MA: Hay Group Transforming Learning.
- Kolb, A. and Kolb, D. (2005b). Learning styles and Learning Spaces: Enhancing Experiential Learning in Higher Education. *Academy of Management & Education*, 4 (2), 193-212.
- Kolb, A. and Kolb, D. A. (2008). *Experiential learning theory: A dynamic, holistic approach to management learning*. Handbook of Management Learning, Education and Development. London: Sage Publications.
- Laeq, K., Weatherly, R., Carrot, A., Pandian, V., Cummings, C. and Bhatti, N. (2009). Learning styles in two otolaryngology residency programs. *The Laryngoscope*, 119 (12), 2360-2365.
- Mestre, L. (2006). Accommodating Diverse Learning Styles in an Online Environment. *Reference & User Services Quarterly*, 46 (2), 27-32.
- Mutlu, M. ve Aydoğdu, M. (2003). Fen Bilgisi Eğitiminde Kolb'un Yaşantısal Öğrenme Yaklaşımı, *Pamukkale Üniversitesi Eğitim Fakültesi Dergisi*, 13, 15-29.
- Numanoğlu, G. ve Şen, B. (2007). Bilgisayar ve Öğretim Teknolojileri Eğitimi Bölümü Öğrencilerinin Öğrenme Stilleri, *Ahi Evran Üniversitesi Kırşehir Eğitim Fakültesi Dergisi*, 8 (2), 129-148.
- Orhun, N. (2007). An Investigation into the mathematics achievement and attitude towards mathematics with respect to learning style according to gender, *International Journal Of Mathematical Education in Science and Technology*, 38 (3).
- Peker, M. (2003b). Kolb öğrenme stili modeli. *Milli Eğitim Dergisi*, 157, 185-192.
- Ross, D. and Mason, C. (2001, January). University Science Majors In Collaborative Partnerships With Elementary Teachers: Inquiry-Based Teaching And Learning. Paper Presented At The Annual Meeting Of The Association For The Education Of Teachers Of Science, Costa Mesa, CA.
- Senemoğlu, N. (2005). *Gelişim Öğrenme ve Öğretim*. Ankara: Gazi Kitabevi.
- Yıldırım, N. (2007). İlköğretimde Çalışan Eğitimciler Ve İlköğretim Müfettişlerinin Öğrenme Stilleri (Tokat İli Örneği), *Doğu Anadolu Bölgesi Araştırma ve Uygulama Merkezi*, 6(1).