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Investigation of higher education students' learning styles and attitudes towards mobile learning according to various variables

Murat Tuncer[1] Melih Dikmen[2] Ahmet Egemen Akmençe[3]

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Abstract

The purpose of this study is to examine students' learning styles and their attitudes towards mobile learning. In this study, a screening model was used to describe the existing situation. In this context, research was conducted on 209 undergraduate students at Fırat University. To collect data, Kolb Learning Styles Inventory developed by Kolb and adapted to Turkish by Evin Gencel was used. The Mobile Learning Attitude scale developed by Demir and Akpınar was used to examine students' attitudes toward mobile learning. When the findings were examined, it was determined that 46.4% of the students had Assimilator, 25.8% of them Divergers, 14.8% of them Convergers and 12.9% of them had Accommodator learning style. The students with the highest attitude towards mobile learning were found to have a Converger learning style. It was determined that the students with the lowest attitudes towards mobile learning had a Diverger learning style. Among the important characteristics of the individuals with a Converger learning style are shown to prefer to work individually in learning activities. It can be said that individuals who have a Converger learning style are positively influenced by their attitudes toward mobile learning, because many applications on mobile learning platforms allow individual learning.

Keywords: *Mobile Learning Attitude, Learning Styles, Higher Education Students, Kolb Learning Style*

1. Introduction

The individual differences of learners are among the factors to be considered in the learning-teaching process. Individual differences are important in many ways such as planning of education, the ways to be followed in individual career development, and the prevention of mistakes when making decisions about an individual. When the learning-teaching process is referred, many variables come to mind, such as the environment in which the teaching is conducted, teacher qualifications, and learning characteristics. There are many researches such as the interaction of these variables, the relationship between each other, and sometimes the purely variable effect.

Learning characteristics are among the important variables of the learning-teaching process. Learning styles has become as one of the most important variables that comes to mind when it comes to learner features. Smith and Ragan (1999) also state that learners have complex and diverse characteristics and they refer learners' cognitive situations when determining the similarities and differences among them (Cit. Fer, 2009:146). Ornstein and Hunkins (2014: 174) describe learning style as "*preferred learning style*" and explain how the nature of the learning style perceive the knowledge best (visual or auditory), preferred type of information (sensory, intuitive),

[1]Cor. Author, Assoc. Prof. Dr.,Fırat University, Dept. of Educ. Sciences, mtuncer@firat.edu.tr
[2]Lecturer, Fırat University, Distance Education Center., melihdikmen@gmail.com
[3]Ministry of Education, egemenakmence@gmail.com

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how the organized information is handled (induction, deduction), how information is processed (active or reflective) and how the individual understands (sequential or holistic). Başaran (2005: 430) while suggesting a set of principles such as time, reinforcement, meaningful learning, listening time, motivation, he focuses on knowing how to learn rather than what to learn because each student is different in terms of learning style.

Kolb describes learning as a process in which knowledge is acquired through the transformation of experience (Mcleod, 2013). Experience is a situation that differs from one person to another. The process of experience is shaped by the individual qualities and the level of these qualities. Riding and Rayner (1998) have handled the concept of learning style in a broader framework and have stated that they include personal preferences or learning activities as well as individual differences (Cit.Kılıç, 2002). The view of cognitive psychology as "*learning process is influenced by the individual*" indicates that learning styles are also important in the learning process. Is it really effective in learning an individual's style? If the individual's learning style is effective in learning and explains a part of its variance, what is to be known about it and what kind of planning should be done? These questions are seen as important in terms of effective teaching. When these questions are taken into account in terms of field literacy studies, they are very different from each other. Fer (2003) argues that individuals follow different paths when learning, while a learning environment is suitable for one individual, environment may not be suitable for the other. Başaran (2005: 436) states that pupils often find their way of learning on their own and that teachers are not very interested in teaching learning. This determination leads us to the conclusion that teachers are not knowledgeable about the learning styles of their students. Transferring Bruner's views on learning, Yapıcı (2016: 104) states that learners are naturally curious and are inclined to learn how they learn in the learning process. Kılıç (2002) studies this issue on a different scale and emphasizes that there is no definite relationship between the dominant learning style and the preferred learning activity according to the research findings. Likewise, Khaki, Ganjabi and Khodamoradi (2015) noted that learning styles did not affect students' language learning performances. In another study (Okur and Bahar, 2010), the findings indicate that the academic achievement changes according to the learning style, while the learning anxiety does not change.

By using Technological developments in educational settings, new evaluations should be done considering the development and applications of these technologies. As the learning process is influenced by the individual and it is known that the experience is important in this process, an important problematic situation emerges as how the sense of learning styles change together with technology. This research has been carried out in a limited scope with mobile learning tools rather than exploring a general definition that includes broad meanings such as technology. A second limitation is made in terms of variable which is the attitude towards mobile learning tools.

Kitchens and Sharma (2004) and Caudill (2007) have described "*mobile devices as integration of next-generation technologies with web services*". Elçiçek and Bahçeci (2017) claims that learning performance can be improved by offering different learning contents based on the interests and needs of learners in mobile learning environments. Poyraz (2014) has received negative feedback on the effectiveness of these devices such as Tablet PC in his research on mobile devices. According to this research, the usefulness of Tablet PCs in the learning process is a matter of debate. In another research (Kuşkonmaz, 2011), the findings show that teachers' perception of mobile learning are positive. According to Haznedar (2012), attitudes towards e-learning can be

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significantly different according to gender, class level, foreign language level, computer usage experience and frequency of internet usage. Another study that supports these findings in terms of gender change was made by Tekinarslan (2008), indicating that male students 'attitudes toward internet based learning are more positive than female students'. This difference in terms of gender variation has been obtained in some other researches (Işık, Karakış and Güler, 2010, Farmer, Güneş and Üstündağ, 2010; Dikbaş, 2006).

It is understood from the sections above that learning styles and mobile learning are subject to many researches independently of each other. However, there is no study of these two cases studied together. As mobile learning takes place in many ways in learning-teaching processes, it will be an important outcome in terms of education to reveal the relationship between these two situations. Based on this information, the general aim of the research can be explained as the learning styles of the university students and their attitudes towards mobile learning according to various variables. For this general purpose, the following questions were tried to be clarified in the research.

- How is the distribution of sample students in terms of learning styles?
- Is there a significant relationship between students' genders and learning styles?
- How is the distribution of students' dominant learning styles according to age level?
- Is there a meaningful relationship between students' dominant learning styles and seniority or graduation status?
- What are the attitudes of students towards mobile learning?
- Do the students' attitudes towards mobile learning differ significantly in terms of their gender?
- Are the attitudes of students towards mobile learning significantly differentiated from the daily internet use?
- Do the students' attitudes towards mobile learning differ according to their age level?
- How is the distribution of students' attitude score averages according to dominant learning styles?
- Are the students' attitudes towards mobile learning significantly differentiated from the dominant learning styles?

2. Methodology

This study was conducted according to the screening model. Karasar (2009: 176) describes the survey model as describing the current situation as it is. The universe of the study consists of students enrolled in higher education institutions. The sample of the research consists of the individuals who are studying at Fırat University. A simple random sampling method was used in the selection of the sample. In this sampling method, every element of the universe has equal chance of being part of the sample (Arıkan, 2004, p.141). In this respect, the sample of the research is composed of 209 students studying at Fırat University. Two different tools were used to collect data in the survey.Kolb Learning Style Inventory-III (KÖSE-III) developed by Kolb (1999) and adapted to Turkish by Evin Gencel (2007) was used as the first data collection tool of the research. Adapted to Turkish and studied the validity and reliability by Evin Gencel (2007), Cronbach Alpha reliability coefficients of the learning style inventory was found to be between 0.71 to 0.80 in the study. In this study, Cronbach's Alpha, used to calculate the reliability for four dimensions

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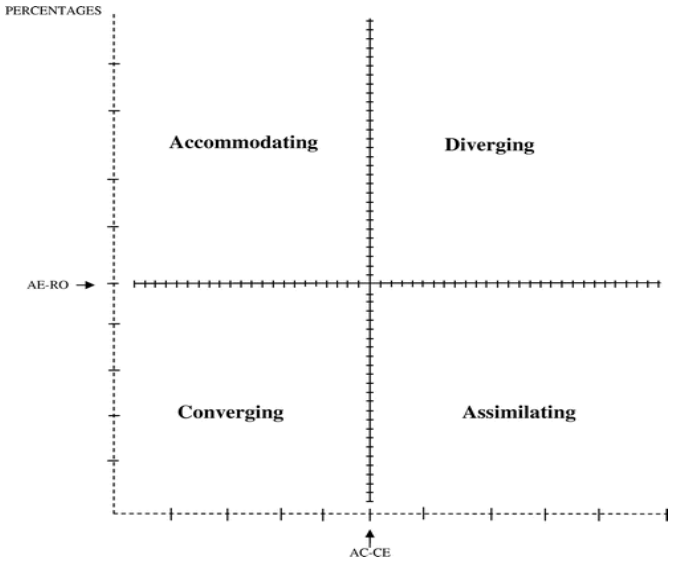
of the inventory, was found between .68 and .76. Therefore, it is considered appropriate to use the inventory in the research.

The inventory consists of 12 items of 4 choices that ask individuals to rank four learning styles that best describe their learning style. Each of the 4 choices in each statement in the inventory represents a different form of learning. These are: 1. Concrete Experience (CE), 2. Reflective Observation (RO), 3. Concrete Conceptualization (CC), and 4. Active Experience (AE). As a result of the responses of the respondents to each option, the total score for each option ranges from 12 to 48. However, unified scores are needed to determine the learning style of the learners. Unified scores are calculated by taking the difference between Abstract Conceptualization - Concrete Experience and Active Experience - Reflective Observation. The scores obtained as a result of these operations range from -36 to +36. The positive scores obtained from the combined score of AC-CE show that learning is abstract, whereas the negative scores show that the learning is concrete. Likewise, the positive score obtained by AE-RO show that learning is active, whereas the negative score indicates that the learning is reflective. By determining the intersection points of the combined points with the help of the following diagram, learning style can be found out.

Figure 1. Score diagram of learning styles inventory by KOLB



The Mobile Learning Attitude scale developed by Demir and Akpınar (2016) was used to measure attitudes toward mobile learning. Scale consists of four subscales such as Satisfaction, Effect to Learning, Motivation and Usability. The calculated Cronbach's alpha reliability coefficient in this study is .96.

Cronbach's Alpha value is used to calculate the appropriateness and reliability of the scales in the researches. The evaluation criterion used in the evaluation of Cronbach's Alpha coefficient is as below (Özdamar, 2013:555);

- If it is $0{,}00 \leq \alpha < 0{,}40$, the scale is not reliable.
- If it is $0{,}40 \leq \alpha < 0{,}60$ scale is low reliable.
- If it is $0{,}60 \leq \alpha < 0{,}80$ scale is quite reliable.
- If it is $0{,}80 \leq \alpha < 1{,}00$ scale is a reliable measure at a high level.

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Tuncer, M., Dikmen, M., Akmençe, A.E. (2018). Investigation of higher education students' learning styles and attitudes towards mobile learning according to various variables. *International Journal of Social Sciences and Education Research*, 4(3), 433 - 446.

In this study, the Cronbach's alpha coefficient calculated to determine the reliability of the scales was found to be 955 and 729, respectively. It is also seen that adverse statements are used to increase the reliability of the scales. In the analysis of the data, chi-square, percentage, frequency, independent groups t-test and Anova were used.

3. Findings

The first finding of the research concerns the dominant learning styles of students in terms of any variables (faculty, gender etc.). Findings related to this situation are shown in Table 1.

Table 1. Values of students' dominant learning styles

Learning Styles	**F**	**%**
Accommodators	27	12.9
Divergers	54	25.8
Convergers	31	14.8
Assimilators	97	46.4
Total	209	100.0

As seen in Table 1, it was found that 12.9% of the students (n = 27) are Accommodators, 25.8% of them are Divergers (n = 54), 14,8% of them are Convergers (n = 31) and %46.4 (n= 97) of them are Assimilators. Accordingly, the dominant learning style of the students is the assimilator learning style.

The findings in Table 2 were reached when the students' learning style were subjected to a classification in terms of their genders. Table 2 also provides a chi-square analysis of the relationship of students' dominant learning styles with their genders.

Table 2. Distribution of values regarding students 'dominant learning styles based on gender

	Female		**Male**	
Learning Styles	**F**	**%**	**F**	**%**
Accommodators	10	9.0	17	17.3
Divergers	37	33.3	17	25.8
Convergers	18	16.2	13	13.3
Assimilators	46	41.4	51	52.0
Total	111	100.0	98	100.0

X^2=9.515, df=3, p= .023

As seen in Table 2, there is a significant relationship between students' gender and dominant learning styles (p< .05). As a result, %9 of female participants (n=10) and %17.3 of male participants (n=17) are Accommodators, %33.3 of female participants (n=37) and %25.8 of male participants (n=17) are Divergers, %16,2 of female participants (n=18) and %13.3 of male participants (n=13) are Convergers, %41.4 of female participants (n=46) and%52 of male participants (n=51) are Assimilator learners.

Based on the third sub-objective of the research, it was tried to determine how the dominant learning styles of the students were distributed according to the age level. Findings for this situation are given in Table 3.

ISSN: 2149-5939

Tuncer, M., Dikmen, M., Akmençe, A.E. (2018). Investigation of higher education students' learning styles and attitudes towards mobile learning according to various variables. *International Journal of Social Sciences and Education Research*, 4(3), 433 - 446.

Table 3. Distribution of the values of the students' dominant learning styles according to age level

	18-23		24-29		30 and over	
Learning Styles	**F**	**%**	**F**	**%**	**F**	**%**
Accommodators	13	13.3	8	11.3	6	15.0
Divergers	36	36.7	16	22.5	2	5.0
Convergers	13	13.3	10	14.1	8	20.0
Assimilators	36	36.7	37	52.1	24	60.0
Total	98	100	71	100	40	100

X^2=16.794, df=6, p= .010

As seen in Table 3, it was determined that the students' dominant learning styles differed significantly according to age level. %13.3 of the individuals in the range of 18-23 (n=13) are Accommodators, %36.7 of them are Divergers (n=36), %13.3of them(n=13) are Convergers and %36.7 of them (n=36) are Assimilator learner, %11.3 of the individuals in the range of 24-29 (n=8) are Accommodators, %22.5 of them (n=16) are Divergers, %14.1of them (n=10) are Convergers and %52.1of them (n=37) are Assimilator learners, %15 of the individuals in the range of 30 and over (n=6) are Accommodators, %5 of them (n=2) are Divergers, %20 of them (n=8) are Convergers and %60 of them (n=24) are Assimilator learners.

Table 4. Distribution of students' dominant learning styles according to final grade or graduation status

	Final Grade		Graduated	
Learning Styles	**F**	**%**	**F**	**%**
Accommodators	20	16.3	7	8.1
Divergers	36	29.3	18	20.9
Convergers	18	14.6	13	15.1
Assimilators	49	39.8	48	55.8
Total	123	100	86	100

X^2=6.737, df=3, p= .081

As shown in Table 4, when the distribution of the dominant learning styles of the students according to their seniority or graduation status was examined, it was found that there was no meaningful relation according to the final grade or graduation status (p> .05).While %16.3 of the students in final year (n=20) are Accommodators, %29,3of them (n=36) Divergers, %14.6 of them(n=18) are Convergers %38.8of them (n=49) are Assimilator learners, %8,1of the graduated students (n=7) are Accommodators, %20.9 of them (n=18) are Divergers, %15.1 of them (n=13) are Convergers and %55.8 of them (n=48) are Assimilator learners.

The mean, standard deviation, and relative variability coefficients of the answers given by the students to the Mobile Learning Attitude Scale are shown in Table 5.

Table 5. Some statistics on students' attitude scores for mobile learning

	N	Mean	sd
MLA_{TOTAL}	209	3.38	.628
$MLA_{SATISFACTION}$	209	3.16	.768
$MLA_{LEARNING\ EFFECT}$	209	3.89	.775
$MLA_{MOTIVATION}$	209	3.23	.861
$MLA_{USEFULLNESS}$	209	3.36	.807

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As seen in Table 5, the average attitude level of mobile learning in the survey is (3.38 ± .628) When the averages about subscale are examined, it can be seen that satisfaction is (3.16 ± .768) level, learning effect is (3.89 ± .755), Motivation is (3.23 ± .861) and usefulness is (3.36 ± .807) level.

In the study, the students' attitudes towards mobile learning were also compared in terms of some independent variables. One of these independent variables is gender. Students' opinions on mobile learning are compared according to gender and t-test results are as in table 6.

Table 6. Gender analysis of students' attitudes towards mobile learning

	Group	**N**	**Mean**	**sd**	**t**	**p**
Attitudes Towards Mobile Learning	Female	131	3.32	.639	-1.477	.141
Levene (F= .708, p= .401)	Male	116	3.45	.611		

As seen in Table 6, it is seen that the attitudes scores of mobile learners does not differ significantly in terms of gender (p> .05).

Within the scope of the study, it was investigated whether the attitude towards mobile learning differed significantly from the daily average internet use duration. In this context, significant differences in opinions have been determined in the general and satisfaction subscales of the scale. Findings are shown in table 7.

Table 7. Analysis of students' attitudes towards mobile learning based on their daily average internet usage

	Group	**Levene Test**		f, $\overline{x}$ **and sd others and ANOVA**				
		F	P	**N**	**Mean**	**sd**	**F**	**p**
Attitudes Towards Mobile Learning	Less than 3hours	.242	.785	95	3.36	.616	1.900	**.152**
	3-6 hours			77	3.32	.620		
	7-10 hours			37	3.56	.658		
	Total			209	3.38	.628		
MLA$_{SATISFACTION}$	Less than 3hours	2.198	.114	95	3.13	.699	1.151	**.142**
	3-6 hours			77	3.09	.805		
	7-10 hour			37	3.39	.840		
	Total			209	3.16	.768		
MLA$_{LEARNING\ EFFECT}$	Less than 3hours	1.088	.339	95	3.85	.798	.568	**.391**
	3-6 hours			77	3.86	.775		
	7-10 hours			37	4.05	.714		
	Total			209	3.89	.775		
MLA$_{MOTIVATION}$	Less than 3hours	.011	.989	95	3.20	.862	.786	**.457**
	3-6 hours			77	3.19	.873		
	7-10 hours			37	3.39	.838		
	Total			209	3.23	.861		
MLA$_{USEFULLNESS}$	Less than 3hours	.772	.463	95	3.39	.830	.729	**.484**
	3-6 hours			77	3.28	.760		
	7-10 hours			37	3.46	.851		
	Total			209	3.36	.807		

As shown in Table 7, there is no significant difference in the whole and all subscales of the students' attitude scores towards mobile learning according to their daily average internet usage duration (p> .05).

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It was investigated through one-way ANOVA whether there is a relationship between attitude towards mobile learning and the age level. Findings are shown in table 8.

Table 8. Analysis of students' attitudes towards mobile learning according to their age levels

	Group	**Levene Test**			**f, $\bar{x}$ and sd Other and ANOVA**				
		F	P	**N**	**Mean**	**sd**	**F**	**p**	**Difference**
Attitudes Towards	18-23	.165	.848	98	3.35	.646	2.055	.131	
Mobile Learning	24-29			71	3.33	.629			
	30 and over			40	3.56	.559			
	Total			209	3.38	.628			
MLA$_{SATISFACTION}$	18-23	.317	.729	98	3.15	.758	1.021	.362	
	24-29			71	3.10	.798			
	30 and over			40	3.31	.739			
	Total			209	3.16	.768			
MLA$_{LEARNING\ EF-FECT}$	18-23	1.428	.242	98	3.82	.833	3.142	**.045**	**3>1**
	24-29			71	3.83	.771			**3>2**
	30 and over			40	4.16	.565			
	Total			209	3.89	.775			
MLA$_{MOTIVATION}$	18-23	.612	.543	98	3.18	.911	.806	.448	
	24-29			71	3.21	.812			
	30 and over			40	3.38	.821			
	Total			209	3.23	.861			
MLA$_{USEFULLNESS}$	18-23	1.937	.147	98	3.34	.792	.822	.441	
	24-29			71	3.30	.892			
	30 and over			40	3.50	.679			
	Total			209	3.36	.807			

1=18-23 age group, 2=24-29 age group, 3=30 and over age group

As shown in Table 8, it was found that the students' attitudes scores towards the whole scale and mobile learning, satisfaction, motivation and usability subscales do not significantly differ according to the age levels of the individuals (p> .05).Learning Effect subscale significantly differ according to age variable (p=.045< .05) and it seems to be favored for participants who are 30 and over. One of the questions that may come to mind from this finding is how distribution of the attitude toward mobile learning based on the dominant learning style. The distribution of the attitude toward mobile learning according to the dominant learning style is as shown in table 9.

Table 9. The distribution of the attitude toward mobile learning according to the dominant learning style

Scale	**Learning Style**	**N**	**Mean**	**sd**
MLA$_{TOTAL}$	Accommodators	27	3.36	.604
	Divergers	54	3.24	.645
	Convergers	31	3.49	.639
	Assimilators	97	3.43	.617
	Total	209	3.38	.628

As can be seen in Table 9, when the distribution of students' attitude for mobile learning and all subscales are examined according to their learning styles, it is understood that the highest average belongs to Convergers and the lowest average belongs to Divergers. The results of one-way ANOVA on the differences between the averages are presented in Table 10.

ISSN: 2149-5939

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Table 10. Differences in attitudes towards mobile learning according to students' dominant learning styles

		Levene Test		**f, $\bar{x}$ and sd others and ANOVA**				
		F	**p**	**Sum of S.**	**df**	**Mean of S.**	**F**	**p**
MLA_{TOTAL}	Between Groups	.088	.966	1.551	3	.517	1.324	.267
	Within Groups			94.909	243	.391		
	Total			96.460	246			

As seen in Table 10, there is no significant difference in opinion between the attitudes towards mobile learning and sub-dimensions according to individuals' dominant learning styles ($p > .05$).

4. Results and discussion

It has been revealed through many researches (Evin Gencel, 2008; Demir, 2008; Kolb and Kolb, 2005) that in the shaping of individual learning styles many factors such as emotional, cognitive and psychomotor traits, gender and occupation of learning areas (numerical, verbal and both), are effective. Rapid developments in technology in recent years have changed many situations in our lives (shopping, social environment, etc.), as well as affecting learning-teaching methods, techniques and styles. Especially with the increasing use of mobile technology (TÜİK, 2017), it is observed that learning activities are carried out independently of time and place (outside of home and school) (Sharples, 2000). Indeed, we can see that mobile technology is used extensively by many people almost everywhere such as on the subway, in the airplane and while eating. It is thought that it will be important to determine the relationship between learning attitudes through such intensively used mobile technologies and the dominant learning styles of the individuals.

It was determined that the students who constituted the research sample had mostly Assimilator learning style in terms of evaluations of many independent variables. Veznedaroglu and Özgür (2005) emphasized that the most prominent feature of people with assimilator learning styles is to create conceptual models. While they are learning, they focus on abstract concepts and ideas and they need opportunities to process knowledge. The finding in the research that the dominant learning style is assimilator is parallel to the research findings of Kılıç (2002) and Çağıltay and Tokdemir (2004). Okur and Bahar (2010) have identified the dominant learning styles as Divergers and Assimilators in their research. This finding is completely parallel to the findings of Özgür (2013a). Oral (2003) found that students in science and social fields prefer abstract conceptualization, students in Turkish-mathematics and vocational fields prefer to learn through active life. Similarly, Demir (2008) found that the majority of Turkish teacher candidates had a Diverger and Assimilator learning style. Threeton and Walter (2009), who conducted research on the students of the Automotive Technology Program, found that sample group consisted of mostly Accommodators and Assimilators style learners. Having different results from different sample groups can be considered as a clear indication that learning styles are affected by many factors.

Demir and Aybek (2012) investigated the relationship between learning styles and multiple intelligences of students, they found positive relationships in the result of the research and determined that the multiple intelligence fields reveal learning styles at significant rates. Güven and Kürüm (2008) report that there are a certain relationship between students' learning styles and their tendency to think. These research findings show that there is a need for a diagnostic process in the sense of learning styles before the learning-teaching process. Teaching before determining

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changeable learning styles according to sample group, teaching programme and intelligence type can lead to some losses in terms of the quality of education that has been aimed at teaching.

According to research findings, there is a significant relationship between the gender of the students and their dominant learning styles. However; Demir (2008) reports that there is no significant relationship between learning style and gender. Findings in the research show that the general and dominant learning style is Assimilator. When the dominant learning styles were examined according to the gender, it can be seen that men have a Diverger learning style in the second place and Convergers in the third place while women had a Diverger learning style in the second place and Accommodator are in the third place. This finding was also obtained by Ergur (2010). However, according to some researchers (Özgür, 2013;Özgür, 2013a;BaharandSülün, 2011; Can, 2011; Biçer, 2010; Yurtseven, 2010; BaharÖzenandGülaçtı, 2009; Yenice and Saracaloğlu, 2009; Köseoğlu, 2009; Gürsoy, 2008; Mutlu, 2008; Güneş, 2004; Uzuntiryaki, Bilgin and Geban, 2004; Akgün, 2002) learning style does not change based on gender. It is thought that the results of different studies based on relationship between the gender variable and the dominant learning style may be due to the version differences of the inventories used in the researches or the different qualities of the participants in the researches.

The study also found significant differences between dominant learning styles and age levels. Similar findings were obtained in Magdalena (2015), Numanoğlu and Şen (2007) surveys. However, Atabay and Kurman (2013), Özgür (2013), Özgür (2013a) and Şenyuva (2009) report that mean scores of learning styles does not differ significantly with age.Can (2011) and Akgün (2002) obtained results in parallel with the research findings of Atabay and Kurman (1963). In a study conducted by Truluck and Courteney (2017), they found that 55-65 age group prefer to learn with their emotion,66-74 age group prefer to learn by emotion and observation and 75 and over age group prefer to learn through thinking and observing. Researchers who have set out from this finding have emphasized the importance of learning styles in teaching because people become more active observer as they grow up.

A significant relationship was also found between the dominant learning style and the learning situation, and it was seen that the learning style could differ significantly according to the final grade or graduation status. However, in both learning situations, Assimilator is the highest dominant learning style. It is noteworthy that the assimilator learning style in the last year is increasing as dominant learning style.Işık (2011) notes that learning styles differ significantly in relation to class level, similar to findings of this study. Unlike these findings, Özgür (2013) and Özgür (2013a) stated that learning styles does not differ according to class level.

Another finding is that students' attitudes scores towards mobile learning are close to each other. Despite the different features such as department, class, and gender, we can explain this similarity in terms of attitude scores as the widespread use of mobile technologies. Teacher candidates do not have significant opinion differences in terms of mobile learning. While there is no significant difference in terms of age and gender, in terms of the duration of daily internet usage, there is a meaningful difference between users who use the internet for seven hours and more and those who use it for 3-6 hours. If the 3-6 hour daily internet use period is interpreted as a period in which daily routine work is done, it can be explained as a natural situation that more than 7 hours internet users have higher attitude scores for mobile learning. The finding of Elçiçek and

ISSN: 2149-5939

Bahçeci (2017) can be interpreted that mobile learning management systems have developed positive attitudes towards mobile learning. Similar findings were obtained by Özgür and Tosun (2010). The finding of Şimşek and Yıldırım (2016) shows that gender does not make a meaningful difference in terms of attitudes towards technology and this is parallel to this research. Tekinarslan's (2008) finding that students' attitudes towards e-learning are generally positive is found to be consistent with the obtained averages. However, Haznedar (2012) reported that university students' attitudes towards e-learning differ significantly in terms of gender, class, and frequency of internet use. The only similar findings with this research is the internet usage frequency.

Finally, the study found that the dominant learning style did not make a significant difference in terms of attitudes towards mobile learning. However, in the study of Haznedar (2012), there was a significant difference between the attitudes towards e-learning according to learning style and the attitudes towards e-learning of visual students were found higher than the other students.

An impression from research findings and field literature research is that learning styles may change depending on many variables. At this point, we can describe the learning style as both an influencing and influenced variable. It seems that in the terms of learning styles we are not able to present all the aspects and variable interactions to the trainers. However, at least, we can suggest learning styles as an input variable before starting teaching. The technological tools with developing and changing effects must always be questioned in terms of their learner characteristics.

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