Available online at www.sciencedirect.com

ScienceDirect

Procedia - Social and Behavioral Sciences 174 (2015) 1099 – 1106

Procedia
Social and Behavioral Sciences

INTE 2014

The investigation of attitude and readiness of information and communication technologies pre-service teachers toward web based learning

Mustafa Yağcı[a], Didem Alsancak Sırakaya[a], Gül Özüdoğru[a*]

[a]*Ahi Evran University, Faculty of Education, Computer Education and Instructional Technology Department, Kırşehir 40100, Turkey*

Abstract

The present study aims to investigate attitudes and readiness of Information and Communication Technologies pre-service teachers toward web-based learning. In the study group of the research are 165 pre-service teachers. The study was conducted in the survey model. As data collection tools, 'Web-based Teaching Attitude Scale' and 'Readiness and Expectation Scale for e-Learning Process' were utilized. In analysis of the collected data, descriptive statistics, t-test, and ANOVA analysis were conducted. As a result of the research, it was found that attitude levels of pre-service teachers were lower than median; and their readiness levels were above the median. Moreover, in terms of gender, there was no significant difference between attitude and readiness scores. While there was no significant difference among attitude scores in terms of number of years in education, there was significant difference in readiness scores.

Peer-review under responsibility of the Sakarya University

Keywords: web-based learning; attitude; readiness

* Corresponding Author. Tel: +90 386 2805135
E-Mail address: gerturk@ahievran.edu.tr

Peer-review under responsibility of the Sakarya University
doi:10.1016/j.sbspro.2015.01.800

1. Intruduction

In the current information age, fast-paced developments experienced in the information and communication technologies have reflected on education area like all areas of life. Along with the technological innovations, countries have started to rearrange their education programs and policies (Çetin and Günay, 2011). In this scope, the internet, one of the significant technology advancements, has started to be used a resource with priority to fulfill education need and life-long learning demand. Internet environment enabled educational institutions to transfer their activities onto the web environment independent from spatial and temporal conditions due to the advantages of the internet (Demir, Kaymak and Horzum, 2013). At this point, one of the new learning – teaching models developed recently by educators was web-based teaching model (Çetin and Günay, 2010). Web-based teaching was defined as a learning environment in which the educational content is presented through a web browser (Karataş, 2008).

Through web-based teaching, learners are enabled to have access information from anywhere and on anytime by means of computer and internet technologies (Yiğit, Yıldırım and Özden, 2000). Besides the internet-based education applications, web-based teaching has also enabled developing interaction and communication, creating discussion platforms, and taking advantages of chat programs (Cömert, 2012). Moreover, it is possible to fulfill learners' personal learning needs and to develop their motivation by means of web-based teaching (Yeniad, 2011). Visual structure, communication and interaction capabilities and personal education opportunity can be considered as advantages of the web-based education (Alessi, & Trollip, 2001, referenced by Arkün, Baş, Avcı, Çevik and Gürcan, 2009). Additionally, web-based teaching have advantages without spatial and temporal dependency such as ability to work with materials enriched with audio and video animation, self-learning, self-regulation, and time management (Tüysüz and Aydın, 2007). Moreover, Cook (2007) enumerated the advantages of the web-based teaching as reusability of resources and materials, flexible scheduling, updateability of resources, personalized teaching, new teaching methods, evaluation and documentation. In addition to its advantages, web-based teaching exhibits several disadvantages as well. Some of these disadvantages are social isolation, cost, technical problems, and weak educational design (Cook, 2007).

Although there are numbers of advantages, online learning is required to have readiness characteristic so that students can utilize from these advantages similar to ones in the web-based learning environment (Yurdugül and Alsancak Sırakaya, 2013). In these environments, it is important for students to have readiness in terms of technical skills, motivation, and access to technology in the context of the efficiency and productivity of the process. In web-based systems, interests, expectations and required competencies of students may differ according to the conventional education (Frith and Kee, 2003). Hence, it was stated that readiness in distance learning, web-based learning, blended learning and online learning is a factor that must be taken into consideration (Usal and Bayrak, 2005; Tezer and Biçen, 2008; Demir Kaymak and Horzum, 2013).

When it is considered in terms of web-based education environments, besides the readiness, attitude is another variable that must be considered. It is important taking sensual characteristics such as attitude into consideration to create learning experience (Küçükahmet, 1997). As it is same with the conventional education environments, success of the web-based education environments depends on attitude of students toward web-based teaching (Erdoğan, Bayram and Deniz, 2007); and it largely affects learning process (Alomyan & Au, 2004). Along with the changing student roles, it is important for students to develop positive attitude toward this environment and to embrace them as part of their learning culture (Erdoğan, Bayram and Deniz, 2007). In the literature, students' attitude toward web-based teaching has been focused and its significance has been emphasized through researches (Kurubacak, 2000; Manzares, 2004; Özgür, 2011; Uzun, Özden and Yıldırım, 2013).

Application of web-based learning environments in education and number of studies in this subject has been increased significantly. Essential reason behind the expansion of web-aided education is their contribution to the learning-teaching environments (Yağcı, 2012). While effects of the web-based learning environments are being investigated, characteristics of environments and learners are required to be considered for successful results. In the web-based teaching environments, learners' characteristics are the factors to be considered. Readiness, attitude, gender, learners' grades are some of the factors to be considered. In terms of effectiveness and productivity of the process, it is important for learners to have positive attitude and to be at certain readiness level.

Attitude and readiness of pre-service teachers studying at the department of computer and teaching education toward web-based teaching are important since they are more related with technology compared to the other departments and they would take role in expansion of technology usage in the institutions where they perform their occupation. While pre-service teachers are in the user position regarding web-based learning environments during their undergraduate education; they will be designer and applier position for these environments in the future. Therefore, their high level of attitude and readiness toward web-based teaching would increase their potential to use these environments in their own courses.

The purpose of this research is to investigate attitude and readiness of pre-service teachers at the department of Computer Education and Instructional Technology toward web-based learning. Within this framework, following purposes were responded:

1. What are the attitude and readiness levels of pre-service teachers toward web-based learning?
2. Do the attitude and readiness levels of students toward web-based teaching vary significantly based on gender?
3. Do the attitude and readiness levels of students toward web-based teaching vary significantly based on their grade level at the school?

2. Method

In the present study, attitude and readiness levels of pre-service teachers toward web-based learning were investigated. Since an existing condition was investigated, a survey model was used. The survey model is appropriate approach for studies aiming to describe a circumstance which existed in the past or still present (Karasar, 2009).

2.1. Participants

The study group of the research was consisted of 165 pre-service teachers at the department of Computer Education and Instructional Technology in the Faculty of Education at the Ahi Evran University during spring semester in the educational period of 2013-2014.

Table1. Gender distribution of the pre-service teachers

Gender	f	%
Female	94	57
Male	71	43
Total	165	100

When Table 1 is considered, it can be seen that 94 of pre-service teachers were female (57%), and 71 of them were male (43%).

Table 2. Distribution of pre-service teachers according to their grade level

Class	f	%
1	43	26.1
2	43	26.1
3	41	24.8
4	38	23.0
Total	165	100

When Table 2 is investigated, it was seen that the number of first grade students were 43 and they constitute 26.1% of general population; the number of students on the second, third and fourth grade were 43 (26.1%), 41 (24.8%) and 38 (23%) respectively.

Table 3. Distribution of pre-service teachers according to type of high schools where they were graduated from

Type of the high school	f	%
General high school	18	10.9
Occupational high school	106	64.2
Science high school	1	0.6
Anatolian high school	27	16.4
Other	11	6.7
Undeclared	2	1.2
Total	165	100

When Table 3 is investigated, it was observed that the number of graduates from general high schools were 18 (10.9%), from occupational high school were 106 (64.2%), from a science high school 1 (0.6%), from an Anatolian high school 27 (16.4%), from other type of high school were 11 (6.7%), and the number of undeclared were 2 (1.2%).

2.2. Data Collection Tool

As data collection tolls, demographic information form, 'Web-based Teaching Attitude Scale' developed by Erdoğan, Bayram and Deniz (2007); and 'Readiness and Expectation Scale for e-Learning Process' developed by Gülbahar (2012) were utilized.

Demographic Information Form: At this section, gender, graduate level and graduated high school information of pre-service teachers were acquired.

Attitude Scale for Web-based Teaching: 'Web-based Teaching Attitude Scale' developed by Erdoğan, Bayram and Deniz (2007) consists of 26 items whose validity and reliability analyses were performed, and in five-scale Likert form. It is composed of two dimensions called "Web-based Teaching Efficiency" and "Resistance against Web-based Teaching". The overall Cronbach's Alfa internal consistency coefficient of the model was determined as 0.917.

Readiness and Expectation Scale for e-Learning Process: 'Readiness and Expectation Scale for e-Learning Process' was developed by Gülbahar (2012) and its validity and reliability analyses were performed while it was formed in five-scale Likert structure. It was totally consisted of 26 items in five dimensions: "Personal Characteristics" in 4 items, "Access to technology" in 4 items", "Technical Skills" in 8 items, "Motivation and Attitude" in 4 items and "Factors effecting success" in 6 items. The general Cronbach's Alfa reliability coefficient was found as 0.93 for the scale.

The data collection process was performed based on voluntary participation for the spring semester of the educational year in the period of 2013-2014 and distributed in the printed form.

2.3. Data Analysis

In the data analysis, SPSS (Statistical Package for Social Sciences) 20 package program was employed. Skewness and kurtosis values of application data were investigated and it was seen that it presents normal distribution. Skewness and kurtosis values were in the range of 0.04 and 2.57. Description and correlation analyses were performed. Descriptive analyses were also employed in analysis of demographic data and in calculation of measurement tool scores. Correlation analysis was performed to investigate relationship between readiness and attitudes of pre-service teachers.

3. Findings

In this section, findings supporting purposes of the analysis were included.

1. To determine attitude and readiness levels of students toward web-based teaching, average scores were investigated in terms of total score and factor score. The relevant data were exhibited on Table 4 and Table 5.

Table 4. The attitude level toward web-based teaching

	Min	Max	$\overline{X}$	S.S
Efficiency of web-based teaching	1.00	4.65	3.40	.60
Resistance against web-based teaching	1.67	5.00	2.85	.61
Total score	1.77	4.23	3.21	.35

When Table 4 is investigated, it was observed that average score of students toward web-based teaching were found as 3.21. When average scores were taken into consideration for average scores, efficiency of web-based teaching, the average score for sub-factor was found as 3.40; and resistance sub-factor against web-based teaching was found as 2.85. Based on these findings, it can be said that students' attitude levels are on the median level due to both sub-factors and general total.

Table 5. Readiness level toward web-based teaching

	Min	Max	$\overline{X}$	S.S
Personal characteristics	1.00	5.00	3.33	.84
Access to technology	1.00	5.00	4.12	.88
Technical skills	2.00	5.00	4.49	.61
Motivation and attitude	1.00	5.00	3.67	.78
Factors affecting success	1.00	5.00	4.19	.72
Total score	2.19	5.00	4.06	.57

When Table 5 is considered, it can be seen that readiness average score of the students toward web-based teaching was found as 4.06. When the average scores were considered in terms of sub-factors, it was found for personal characteristics as 3.33; for access to technology as 4.12; for technical skills as 4.49; for motivation and attitude as 3.67; for factors affecting success as 4.19. Based on these findings, it can be said that both for sub-factors and for general total, readiness levels of students were in the range between median level and high level.

2. To determine whether attitude and readiness levels of students toward web-based teaching vary according to gender significantly, t test was applied. The analysis results were summarized in Table 6.

Table 6. Attitude and readiness level according to gender

	Gender	N	$\overline{X}$	Ss	Sd	t	P
Attitude toward web-based teaching	Female	82	3.24	.33	150	1.20	.232
	Male	70	3.17	.36			
Readiness toward web-based teaching	Female	86	4.06	.54	150	-1.33	.185
	Male	66	4.13	.61			

There were no significant difference between attitude levels of students toward web-based teaching and their gender ($t = 1.20$, $p > .01$). Similarly, there was no significant difference found between readiness of students toward

web-based teaching and gender (t = -1.33, p > .01). According to these results, it can be said that there was no significant difference in attitude and readiness levels of female and male students toward web-based teaching.

3. To determine whether there is significant difference between class year of students and their attitude and readiness levels of students toward web-based teaching, ANOVA analysis was performed. The analysis results were exhibited on Table 7.

Table 7. Attitude and readiness level according to grade level

Dimension	Grade level	N	$\overline{X}$	SS	sd	F	P	Significant Difference
Attitude toward Web-based Teaching	1	36	3.1271	.29289	.11	4.267	.006	2-4
	2	40	3.9067	.56331	.05			
	3	40	4.1317	.60198	.06			
	4	35	4.1451	.60296	.09			
Readiness toward web-based teaching	1	37	4.0655	.48632	.13	1.457	.229	
	2	41	3.1051	.34434	.04			
	3	41	3.2861	.36539	.05			
	4	34	3.3382	.35678	.09			

As it can be seen from Table 7, according to the results obtained from variance analysis, there was significant difference was found between grade level of students and their attitude scores toward web-based teaching [F(3-151) = .006, p < .05]. To determine the origin of this difference, the Bonferroni analysis was performed and as a result of the analysis, it was revealed that attitude levels of the 4th grade students were higher than the 2nd grade students.

Regarding the readiness scores of students toward web-based teaching, there was no significant difference according to their grade level [F (3-151) = .229, p > .05]. In other words, readiness levels of students toward web-based teaching did not present variation according to their class years.

4. Result and Conclusion

Attitude levels of pre-service teachers toward web-based teaching were found at the median level in terms of both sub-factors and general gross total. The similar results were also obtained in the study of Uzun, Özden and Yıldırım (2013). Moreover, in the study of Yakın and Tınmaz (2013), the positive attitude of pre-service teachers toward e-learning explains this findings as well. Additionally, in the study conducted by Yeniad (2011), it was found that students have positive attitude toward web-based education process.

Readiness of pre-service teachers toward web-based teaching was found in the range between median and high levels in terms of both sub-factors and general total. In the study of Hung, Chou, Chen and Own (2010), readiness levels of students toward online learning was determined high. Stokes, Cannavina, and Cannavina (2004) researched readiness levels of medical school students for web-based learning environments; and it was found that there was no sufficient readiness level.

There was no significant difference between attitude levels of female and male pre-service teachers. In their study, Yakın and Tınmaz (2013) found that attitudes of pre-service teachers toward e-learning do not exhibit

difference based on gender. Chen and Tsai (2005) found significant difference between attitudes of university students toward web-based learning in the favor of female students.

Similarly, regarding the readiness levels of female and male pre-service teachers toward web-based teaching, there was no significant difference. Other studies investigating readiness levels of female and male students toward online learning revealed that there was no difference among them (Hung and et al, 2010).

There was significant difference was found regarding attitudes of pre-service teachers toward web-based teaching on the grade level. It was found that attitude level of the 4th grade were higher than the ones in the 2nd grade. This finding confirms the results of Yakın and Tınmaz (2013). It was found that attitude levels of the senior students toward e-learning were found higher than the first grade. It can be said that this is an expected result because along with the years at school, students gain more technological experience and sufficiency, which enhances their attitude levels.

Among the readiness scores of the pre-service teachers toward web-based teaching, there was no significant difference at the grade level. In the literature, there are different studies revealing various findings. In the study of Hung and et al (2010), it was reported that there was significant difference in online learning readiness levels of students among according to their grade level.

Acknowledgements

This study was supported Scientific Research Project of Ahi Evran University with the project number “PYO-EGF.4001.13.006”

References

Alomyan, H. & Au, W. (2004). Exploration of Instructional Strategies and Individual Difference within the Context of Web-based Learning, *International Education Journal*, 4 (4), 86-92.

Arkün, S., Baş, T., Avcı, Ü., Çevik, V. & Gürcan, T. (2009). ADDIE tasarım modeline göre web tabanlı bir öğrenme ortamı geliştirilmesi. Eğitimin Değişen Yüzü: Yeni Paradigmalar 25.Yıl Konferansı, 14 Mart, Ankara

Chen, R.-S. & Tsai, C. C. (2007). Gender Differences in Taiwan University Students' Attitudes toward the Web-based Learning. *CyberPsychology & Behavior*, 10(5): 645-654.

Cook, D. A. (2007). Web Based Learning: Pros, Cons, and controversie. *Clinical Medicine*, 7(1),37-42.

Cömert, Z. (2012). *Web madenciliği entegre edilmiş semantik web tabanlı öğrenme ortamlarının öğrenci akademik başarı ve tutumlarına etkisi.* Yüksek Lisans Tezi. Fırat Üniversitesi Eğitim Bilimleri Enstitüsü Bilgisayar ve Öğretim Teknolojileri Eğitimi Anabilim Dalı. Elazığ.

Çetin, O. & Günay, Y. (2010). Fen eğitiminde web tabanlı bir öğretimin öğrencilerin akademik başarılarıne ve tutumlarına etkisi, *Çukurova Üniversitesi Eğitim Fakültesi Dergisi*, 38 (3), 19-34

Çetin, O. & Günay, Y. (2011). Fen eğitimine yönelik örnek bir web tabanlı öğretim materyalinin hazırlanması ve bu materyalin öğretmen öğrenci görüşleri doğrultusunda değerlendirilmesi, *Ahi Evran Üniversitesi Eğitim Fakültesi Dergisi*, 12 (2), 175-202

Demir Kaymak, Z. & Horzum, M. B. (2013). Çevrimiçi öğrenme öğrencilerinin çevrimiçi öğrenmeye hazır bulunuşluk düzeyleri, algıladıkları yapı ve etkileşim arasındaki ilişki. *Kuram ve Uygulamada Eğitim Bilimleri*, 13(3), 1983-1797.

Erdoğan, Y., Bayram, S. & Deniz, L. (2007). Web tabanlı öğretim tutum ölçeği: Açıklayıcı ve doğrulayıcı faktör analizi çalışması, *Uluslararası İnsan Bilimleri Dergisi*, 4 (2).

Frith, K.H. & Kee, C. (2003). The effect of communication on nursing student outcomes in a web-based course, *Journal of Nursing Education*, 42 (8), 350-358.

Gülbahar, Y. E. (2012). Öğrenme ortamlarında katılımcıların hazır bulunuşluk ve memnuniyet düzeylerinin ölçülmesi için ölçek geliştirme çalışması. *Ankara Üniversitesi Eğitim Bilimleri Fakültesi Dergisi*, 45(2), 119-137.

Hung, M. -L., Chou, C., Chen, C. H., & Own, z. - Y. (2010). Learner readiness for online learning: Scale development and student perceptions, *Computers & Education*, 55 (3).

Karasar, N. (2009). *Bilimsel araştırma yöntemi.* (19. Baskı). Ankara: Nobel Yayın Dağıtım.

Karataş, S. (2008). Temel Kavramlar ve Kuramsal Temeller, *İnternet Temelli eğitim* (Ed. Halil İbrahim Yalın), Nobel Yayın Dağıtım, Ankara.

Kurubacak, G. (2000). *Online learning: A study of students attitudes towards web-based instruction.* Yayımlanmamış Doktora Tezi, University of Cincinnati, OH.

Küçükahmet, L. (1997). *Öğretim İlke ve Yöntemleri*, Gazi Büro Yayınevi, Ankara, 1997.

Manzanares, M.G. (2004). Attitudes of counseling students’ use of web-based instruction for online and supplemental instruction in a master’s degree program of study. Colorado State University, Yayımlanmamış Doktora Tezi, Fort Collins, Colorado.

Özgür, H. (2011). *Syracuse Modeli ile E-Öğrenme ortamı için tasarlanmış bir dersin öğrencilerin başarısına etkisi: "Trakya Üniversitesi Eğitim Fakültesi örneği"*. Doktora Tezi Trakya Üniversitesi Fen Bilimleri Enstitüsü Bilgisayar Mühendisliği Anabilim Dalı.

Stokes, C. W., Cannavina, C. & Cannavina, G. (2004). The state of readiness of student health professionals for web-based learning environments. *Health Informatics Journal,* 10(3), 195–204.

Tezer, M. & Bicen, H. (2008). Üniversite Öğretim Elemanlarının E-Eğitim Sistemlerine Yönelik Hazır Bulunuşluğu. International Educational Technology Conference, 6-9 Mayıs. Anadolu Üniversitesi.

Tüysüz, C. & Aydın, H. (2007). Web tabanlı öğrenmenin ilköğretim okulu düzeyindeki öğrencilerin tutumuna etkisi, *Pamukkale Üniversitesi Eğitim Fakültesi Dergisi,* 22, 73-84.

Usal, M. R. & Bayrak, M. (2005).E-Öğrenmede bilgisayar/ağ yapısı bakımından etkili parametreler ve Türkiye'nin e-öğrenmeye hazır buluşluğu.*The Turkish Online Journal of Educational Technology*, (4)2, 44-50.

Uzun, E., Özden, M. Y. & Yıldırım, A. (2013). Mesleki Yüksek Öğretimde Öğrencilerin Web Tabanlı Öğrenmeye Karşı Tutumları. Akademik Bilişim Konferansı,5-7 Şubat. Mersin Üniversitesi.

Yağcı, M. (2012).Web tabanlı bir öğrenme ortamı tasarlanması ve geliştirilen bu öğrenme ortamının öğrencilerin akademik başarılarına ve bilgisayara karşı tutumlarına etkisi. *Eğitim Teknolojileri Araştırmaları Dergisi*, 3(4).

Yakın, İ. & Tınmaz, H. (2013). Uzaktan Eğitimde Önemli Bir Boyut: Öğretmen Adaylarının E-Hazırbulunuşlukları, Akademik Bilişim, 23-25 Ocak, Akdeniz Üniversitesi, Antalya

Yeniad, M. (2011). Meslek yüksekokulu öğrencilerinin web tabanlı E-Öğrenme ortamlarına ilişkin algıları*, Mustafa Kemal Üniversitesi Sosyal Bilimler Enstitüsü Dergisi*, 8 (16), 519-533

Yiğit, Y.; Yıldırım, S. & Özden, M.Y. (2000). Web tabanlı internet öğreticisi: Bir durum çalışması. *Hacettepe Üniversitesi Eğitim Fakültesi Dergisi*. 19, 166-176.

Yurdugül, H. & Alsancak Sırakaya, D. (2013). Çevrimiçi öğrenme hazır bulunuşluluk ölçeği: Geçerlik ve güvenirlik çalışması, *Eğitim ve Bilim*, 38 (169), 391-406