

Full Length Research Paper

Investigation of pre-service physical education teachers' attitudes towards computer technologies (Case of Turkey)

Suleyman Can

Mugla Sitki Kocman University, Education Faculty, Department of Elementary Education, Mugla, Turkey.

Received 19 September, 2014; Accepted 5 February, 2015

Elicitation of pre-service physical education teachers' attitudes towards computer technologies seems to be of great importance to satisfy the conditions to be met for the conscious and effective use of the technologies required by the age to be used in educational settings. In this respect, the purpose of the present study is to investigate pre-service physical education teachers' attitudes towards computer technologies and the relationship between these attitudes and some variables. The study was conducted with the participation of 5120 students from 49 different universities of Turkey offering education in the field of Physical Education and Sports in their Schools of Physical Education and Sports in 2010-2011 academic year. In the study designed in the survey model, an Information form developed by the researcher to get information about the demographics of the participants and Computer Technologies Attitude Scale developed by Pala (2006) were used as data collection instruments. The reliability of the scale was calculated with Cronbach alpha coefficient and found to be .87. At the end of the study, it was concluded that the pre-service teachers' attitudes towards computer technologies are positive. Moreover, it was found that these attitudes change depending on the duration of computer possession and level of computer use but do not change depending on having a personal computer and frequency of computer use.

Key words: Physical education, computer, technology, attitude, teacher.

INTRODUCTION

In today's world, use of technology has turned out to be an obligation; hence, individuals must acquire some information, skills, habits and attitudes to adapt themselves to rapidly changing technology, understand technology, become technology literate and take the advantages of technology (Fuller, 2000; Doğan, 2009). Through education, people are enabled to have access to information, arrange, evaluate and present it so that they

can communicate effectively (Akkoyunlu, 1995). Thus, for an effective education and instruction to occur, effective and permanent learning and teaching environments need to be constructed by using educational technologies (Yılmaz et al., 2010). Among the advantages brought about by the use of technology in education is provision of multiple learning environments, satisfaction of individual needs of learners and raising learners' interest

E-mail: scan0767@gmail.com

Authors agree that this article remain permanently open access under the terms of the [Creative Commons Attribution License 4.0 International License](https://creativecommons.org/licenses/by/4.0/)

in lesson by drawing their attention (Yalın, 2003). Individuals educated in such an environment will be able learn in an environment where most of their senses are involved in learning and develop their computer technology information and skills and their computer literacy.

Education of technology literate individuals can be possible through the institutions creating integration between learning-teaching processes and the existing technologies (Andoh, 2012). Therefore, educational institutions should integrate information and communication technologies into their curriculums and classroom applications (Tomei, 2005). There are many factors affecting the correct integration of computer technologies into the education setting. Yet, the most important factor is the behaviors supporting or preventing the use of educational technologies by teachers in learning and teaching process (Hsu et al., 2007; Teo et al., 2008; Yılmaz and Alici, 2011). The factors related to the use of educational technologies by teachers are grouped as internal and external factors (Chai and Khine, 2006; İlhan et al., 2013). Factors such as availability of computer technologies and education policies make up the external factors and factors such as educational philosophy adopted by the teacher, motivation and attitudes of the teacher towards educational technologies and self-efficacy constitute the internal factors (Van Braak, 2001; Galanoui et al., 2004; Ertmer, 2005; Ercan and Özdemir, 2006; Hasan, 2006). Influencing external factors is easier than affecting internal factors as they take long time to change and they are more challenging to change.

Among the internal factors affecting teachers' use of educational technologies, attitudes towards educational technologies are the most important one (Andoh, 2012; Kutluca and Ekici, 2011). Attitudes towards educational technologies have some influences on teachers' preferences for use of educational technologies in learning and teaching process (Yılmaz and Alici, 2011). When the relationship between teachers' attitudes towards educational technologies and the use of educational technologies in learning and teaching process is examined, it is seen that the teachers having more positive attitudes make more use of educational technologies (Hsu et al., 2007; Teo, 2008; İlhan et al., 2013).

In developing societies, the task of teachers is not only to relay the existing knowledge but also to follow innovations and developments continuously and inform students about these developments. In this connection, teachers should be professionals making effective use of educational technologies in education and continuously renewing themselves (Dargut and Çelik, 2014). Therefore, the task of teacher training institutions is to educate pre-service teachers who can understand the importance of technology in life and education and have the skill and self-confidence necessary to make effective use of technology in teaching process (Erdemir et al., 2009).

Teachers' perception of technology is of great importance for them to make effective and efficient use of

technology in their courses (Koç, 2004; Çelik and Kahyaoğlu, 2007). Hence, first thing necessary for teachers to take advantages of technology in their classes is their adopting technology and following technological developments closely and for this to happen, they need to exhibit positive attitudes towards technology (Şahin and Akçay, 2011). Use of educational technologies is important to improve the quality of sports education and for pre-service teachers to see good models about how to correctly use educational technologies for teaching purposes (Roblyer, 2003; Koç, 2004; Demirel, 2006). Among the educational technologies used in educational settings, computer-assisted teaching comes to the fore. It was reported that computer-assisted teaching has a significant effect on the enhancement of achievement (Yalçınalp et al., 1995; Hacker and Sova, 1998; Chang, 2002). In addition to improving achievement, computer-assisted learning contributes to the development of higher thinking skills and as a result, students learn by comprehending rather than memorizing (Renshaw and Taylor, 2000). Today, it is necessary to educate pre-service physical education teachers who have information and skills needed to make effective use of computer technologies while conducting instructional activities in their classes.

The purpose of the present study is to elicit the pre-service physical education teachers' attitudes towards computer technologies. For this purpose, answers to the following questions were sought:

- 1-Does the state of having a personal computer significantly affect the pre-service physical education teachers' attitudes towards computer technologies?
- 2-Does the duration of computer possession significantly affect the pre-service physical education teachers' attitudes towards computer technologies?
- 3-Does the frequency of using computer significantly affect the pre-service physical education teachers' attitudes towards computer technologies?
- 4-Does the level of computer use significantly affect the pre-service physical education teachers' attitudes towards computer technologies?

METHODOLOGY

The sampling of the present study conducted in survey method constitutes the entire universe including 5120 students from 49 different universities of Turkey offering education in the field of Physical Education and Sports in their Schools of Physical Education and Sports in 2010-2011 academic year. The participation was on voluntary basis. Purposive sample method was used in this research.

Data collection

As data collection instruments, an Information form developed by the researcher to get information about the demographics of the participants and 43-item Computer Technologies Attitude Scale developed by Pala (2006) were used. The reliability of the scale

Table 1. t-test results related to scores of the pre-service physical education teachers taken from the attitude scale depending on the possession of a personal computer.

Possession of a personal computer	n	Mean	Sd	Df	t	p
Yes	3358	156.04	19.90	5118	.637	.524
No	1762	155.67	19.66			

Table 2. t-test results related to scores of the pre-service physical education teachers taken from the attitude scale depending on the duration of computer possession.

Duration of computer possession	n	Mean	Sd	df	t	p
1-4 years	2230	154.62	19.63	5118	4.080	.00
5 years or more	2890	156.90	19.91			

was calculated in IBM SPSS 21.0 program package with Cronbach Alpha coefficient formula and was found to be .87. This coefficient shows that the scale is reliable and suitable for application. In order to establish the validity of the scale, experts opinions were sought about whether the items in the scale measure the target attitudes. In the scale, there are five options being "Strongly Agree", "Agree", "Undecided", "Disagree" and "Strongly Disagree". Scoring for the positive items is from 5 to 1 and for the negative items, in reverse order. The lowest score to be taken from the attitude scale is 43 and the highest score is 215. If the score taken from the attitude scale is 43-77, it means "Strongly Disagree"; if it is 77-111, then it means "Disagree"; 112-145 "Undecided"; 146-179 "Agree" and 180-215 "Strongly Agree". Therefore the scale is 5-likert type one; it was considered in five main categories. For defining the category domains, the possible lowest point (43) is subtracted from the possible highest point (215) that can be obtained from the scale and the point is divided into 5 as it is the number of categories. By adding the obtained point (34.4) to the lowest point (34.4), domain points are obtained. The data collection tool was administered to the pre-service physical education teachers in the sampling of the study after granting the required permissions in 2010-2011 academic year. How you say 43-77 are strongly disagree or 146-179 are agree.

Data analysis

The data collected with the scale were analyzed by using IBM SPSS 21.0 program package. Independent samples t-test was used to test whether there is a significant difference in the pre-service teachers' attitudes towards computer technologies depending on possessing a personal computer and duration of computer possession and One-Way ANOVA was employed to test whether there is a significant difference in the pre-service physical education teachers' attitudes towards computer technologies depending on the level of computer use and frequency of computer use.

RESULTS

In this section, the findings of the analyses conducted to determine whether there are significant differences in the pre-service physical education teachers' attitudes towards computer technologies based on some variables are presented. As can be seen in Table 1, 3358 of the pre-service teachers have their personal computers and

1762 do not have their personal computers. The results revealed by t-test show that there is no significant correlation between the pre-service physical education teachers' attitudes towards computer technologies and their possession of a personal computer [$t_{(5118)} = .637$, $p > .05$]. Yet, it is seen that the attitudes of the pre-service teachers having a personal computer ($\bar{X} = 156.04$) are more positive than those of the pre-service teachers not having a personal computer ($\bar{X} = 155.67$). As can be seen in Table 2, 2230 of the pre-service teachers have had a personal computer for 1-4 years and 2890 of them have had a personal computer for five years or more. The results revealed by t-test show that there is a significant correlation between the pre-service physical education teachers' attitudes towards computer technologies and the duration of computer possession [$t_{(5118)} = 4.080$, $p < .05$]. Thus, it can be argued that the duration of computer possession has a significant influence on the students' attitudes towards computer technologies. The difference favors the pre-service teachers having a computer for five years or more.

As can be seen in Table 3, 2541 of the pre-service physical education teachers use computer every day, 1387 of them use computer 2 or 3 days in a week, 531 of them use computer a day in a week, 211 of them use computer a day in a month. When the pre-service physical education teachers' scores taken from the attitude scale are examined, it is seen that the highest mean in relation to frequency of computer use is 156.54 "Two or three days in a week", and the lowest mean is 153.73 "A day in a month". ANOVA results show that there is no significant correlation between the pre-service physical education teachers' attitudes towards computer technologies and their frequency of computer use [$F_{(3-5116)} = 1.599$, $p > .05$]. That is, the students' attitudes towards computer technologies do not significantly vary based on their frequency of computer use.

When the pre-service physical education teachers' level of computer use is examined in Table 4, it is seen

Table 3. ANOVA results related to scores of the pre-service physical education teachers taken from the attitude scale depending on the frequency of computer use.

Variable				n	Mean	Sd	
<i>Frequency of computer use</i>				2541	155.67	20.30	
				1837	156.54	19.12	
				531	155.72	19.41	
				211	153.73	20.39	
	Variance source	Mean rank	df	Sum of ranks	F	p	Difference LSD
	Between-groups	1884.82	3	628.275	1.599	.187	----
	Within-groups	2009698.19	5116	392.826			
	Total	2011583.01	5119				

Table 4. ANOVA results related to scores of the pre-service physical education teachers taken from the attitude scale depending on the level of computer use.

Variable				n	Mean	Sd	
<i>Level of computer use</i>				767	154.74	19.50	
				3359	156.84	19.44	
				994	153.67	21.08	
	Variance Source	Mean Rank	df	Sum of Ranks	F	p	Difference LSD
	Between-groups	8971.41	2	4485.70	11.462	.000	1-2; 2-3
	Within-groups	2002611.60	5117	391.36			
	Total	2011583.01	5119				

that 767 of the pre-service teachers stated that it is "Not Good", 3359 of them stated that it is "Good" and 994 of them stated that it is "Very Good". It was concluded that a great majority of the pre-service physical education teachers are good at computer use and the number of the pre-service teachers who are not good at computer use is low. According to the results of ANOVA, there is a significant correlation between the pre-service physical education teachers' attitudes towards computer technologies and the level of computer use [$F_{(2-5117)} = 11.462$, $p < .05$]. According to the Scheffe test results, the level of computer use of the pre-service physical education teachers has a significant influence on their attitudes towards computer technologies. This correlation stems from the relationship between "Not Good" and "Good" and "Good" and "Very Good".

DISCUSSION

There is no significant correlation between the pre-service physical education teachers' attitudes towards computer technologies and their possession of a personal computer. It was found that the possession of a personal computer does not have a significant effect on

their attitudes towards computer technologies. In light of this finding, it can be argued that even if the pre-service physical education teachers do not have a personal computer, their attitudes towards computer technologies do not significantly change. Yet, when the attitude scores of the pre-service teachers having a personal computer were compared with the pre-service teachers not having a personal computer, their scores were found to be higher. In this respect, the possession of a personal computer, though not significantly, affects the pre-service physical education teachers' attitudes towards computer technologies. This may be because the pre-service teachers having a personal computer have greater self-confidence in the use of computer technologies. This finding concurs with the findings reported by İpek and Acuner (2011), Şahin and Akçay (2011), yet, does not concur with the finding reported by Berkant (2013).

There is a significant correlation between the pre-service physical education teachers' attitudes towards computer technologies and duration of computer possession. The significant difference among the pre-service physical education teachers favors those having a computer for five years or more. It was concluded that the longer the possession of a computer is, the stronger the attitudes towards computer technologies are. This

may be because over time the pre-service physical education teachers get more accustomed to the computer software and hardware, they improve their computer skills and accordingly the negative situations they experience with the computer decrease and their self-confidence increases. In this regard, an increase in the duration of computer possession contributes to the development of positive attitudes towards computer technologies. This finding is supported by the findings reported by Berkant (2013).

There is no significant difference between the pre-service physical education teachers' attitudes towards computer technologies and their frequency of computer use. Thus, it can be argued that the frequency of computer use does not have a significant effect on the pre-service teachers' attitudes towards computer technologies. This finding is parallel to the finding reported by Oktay and Çakır (2012). However, it was also found that the pre-service teachers using computer 2 or 3 days in a week have more positive attitudes, though not significant, than the pre-service teachers using computer every day and those using it a day in a month. Thus, too much or too little use of computer has negative impact on the attitudes towards computer technologies. This may be because when the computer is used too frequently, the user may feel bored and when used rarely, the user may feel himself/herself distant from it and accordingly their interest in computer technologies may decrease and they feel indifferent to them.

It was found that the pre-service physical education teachers' level of computer use was found to be good. This can be interpreted as the pre-service teachers can use computer and make good use of it to have access to information in today's technology age. A significant correlation was found between the pre-service physical education teachers' attitudes towards educational technologies and their level of computer use. In the connection, a significant difference was found between the pre-service physical education teachers whose level of computer use is "not good" and "good" and "good" and "very good". It was understood that the difference between "not good" and "good" is in favor of "good" and the difference between "good" and "very good" is in favor of "good". In light of these findings, it can be argued that the pre-service physical education teachers' level of computer use is effective on their attitudes towards computer technologies. And the difference favors the students having "good" level of computer use and this may be because the pre-service teachers whose level of computer use is "very good" may have excessive self-confidence and this may have negative effect on their attitudes and those whose level of computer use is "not good" may have low motivation and low self-confidence; hence, they may have weaker attitudes towards computer technologies. These findings concur with the findings reported by Kışla (2008) and Berkant and Efendioğlu (2010).

RECOMMENDATIONS

Based on the findings of the present study, the following suggestions can be made:

1. The availability of computers to pre-service physical education teachers should be enhanced and policies should be put into effect to make computer technologies accessible to everyone.
2. The duration of computer use of pre-service physical education teachers should be increased and they should be encouraged to be in technology-intense environments.
3. The frequency of computer use should be neither too much nor too little, educational environments enabling pre-service physical education teachers to have computer at adequate level in their lives.
4. As the level of computer use that is very good or not good deteriorates pre-service physical education teachers' attitudes towards computer technologies, education required of pre-service physical education teachers to meet their technology needs and be useful to the environment in which they are present should be given.

LIMITATIONS OF THE RESEARCH AND DIRECTIONS FOR FUTURE RESEARCH

The present study investigating the pre-service physical education teachers' attitudes towards computer technologies in relation to some variables (possession of a personal computer, duration of computer possession, frequency of computer use and level of computer use) did not take the students from other departments except for physical education department into consideration. Future research may look at students from other departments of teacher training. The present study is limited to undergraduate pre-service physical education teachers. Post-graduate students and academicians can also be included in similar studies. In order to increase the reliability and validity of the present study wider sampling including pre-service teachers from other departments can be studied.

Conclusion

At the end of the study, it was concluded that the pre-service physical education teachers have positive attitudes towards computer technologies. Moreover, it was found that possessing a personal computer and frequency of computer use do not have significant influence on the pre-service physical education teachers' attitudes towards computer technologies. However, duration of computer possession and level of computer use have significant influence on the pre-service physical education teachers' attitudes towards computer technologies. Finally,

it was found that too much or too little use of computer has negative effect on the students' attitudes towards computer technologies.

Conflict of Interests

The author has not declared any conflict of interests.

REFERENCES

- Akkoyunlu B (1995). Bilgi teknolojilerinin okullarda kullanımı ve öğretmenlerin rolü. Hacettepe Üniversitesi Eğitim Fakültesi Dergisi. 11:105-109.
- Andoh CB (2012). Factors influencing teachers' adoption and integration of information and communication technology into teaching: A review of the literature. International Journal of Education and Development Using Information and Communication Technology (IJEDICT). 8(1):136-155.
- Berkant HG, Efendioğlu A (2010). Sınıf öğretmenliği bölümü öğrencilerinin bilgisayarla ilgili öz-yeterlik algıları ve bilgisayar destekli eğitim yapmaya ilişkin tutumları. 9. Ulusal Sınıf Öğretmenliği Eğitimi Sempozyumu, 20-22 Mayıs, Elazığ.
- Berkant HG (2013). Öğretmen adaylarının bilgisayara yönelik tutumlarının ve öz-yeterlik algılarının ve bilgisayar destekli eğitim yapmaya yönelik tutumlarının bazı değişkenler açısından incelenmesi. J. Instructional Technol. Teacher Educ. 3:11-22.
- Chai CS, Khine MS (2006). Understanding ICT integration in schools. In M.S. Khine (Eds.). Teaching with Technology: Strategies for Engaging Learners (pp. 49-62). Singapore: Prentice Hall.
- Chang CY (2002). Does computer-assisted instruction + problem solving = improved science outcomes? a pioneer study. J. Educ. Res. 95(3):143-150.
- Çelik HC, Kahyaoglu M (2007). İlköğretim öğretmen adaylarının teknolojiye yönelik tutumlarının kümeleme analizi. Türk Eğitim Bilimleri Dergisi. 5(4):571-586.
- Dargut T, Çelik G (2014). Türkçe öğretmeni adaylarının eğitimde teknoloji kullanımına ilişkin tutum ve düşünceleri. Ana Dili Eğitimi Dergisi. 2(2):28-41.
- Demirel H (2006). Spor eğitiminin temelleri. Ankara: Bağırgan Yayımevi.
- Doğan N (2009). Bilgisayar destekli istatistik öğretiminin başarıya ve istatistiğe karşı tutuma etkisi. Eğitim ve Bilim. 34(154):3-16.
- Ercan K, Ozdemir D (2006). The relationship between educational ideologies and technology acceptance in preservice teachers. Educ. Technol. Society. 9(2):152-165.
- Erdemir N, Bakırcı H, Eyduran E (2009). Öğretmen adaylarının eğitimde teknolojiyi kullanabilme özgüvenlerinin tespiti. Türk Fen Eğitimi Dergisi. 6(3):99-108.
- Ertmer PA (2005). Teacher pedagogical beliefs: The final frontier in our quest for technology integration? Educ. Development Res. Devel. 53(4):25-39.
- Fuller H (2000). First teach their teachers: Technology support and computer use in academic subjects. J. Res. Computing Educ. 32:511-537.
- Galanouli D, Murphy C, Gardner J (2004). Teachers' perceptions of the effectiveness of ICT-competence training. Computers Educ. 43:63-79.
- Hacker RG, Sova B (1998). Initial teacher education: a study of the efficacy of computer mediated courseware delivery in a partnership concept. Bri. J. Educ. Technol. 29 (4):333-341.
- Hasan B (2006). Delineating the effects of general and system-specific computer self-efficacy beliefs on IS acceptance. Inform. Manage. 43(5):565-571.
- Hsu YS, Wu HK, Hwang FK (2007). Factors influencing junior high school teachers' computer-based instructional practices regarding their instructional evolution stages. Educ. Technol. Society. 10(4):118-130.
- İhan M, Demir S, Arslan S (2013). Öğretmen adaylarının bilgisayar destekli eğitime yönelik tutumları ile epistemolojik inançları arasındaki ilişkinin incelenmesi. Eğitim Teknolojisi Kuram ve Uygulama, 3 (2), 1-22.
- İpek C, Acuner HY (2011). Sınıf öğretmeni adaylarının bilgisayar öz-yeterlik inançları ve eğitim teknolojilerine yönelik tutumları. Ahi Evran Üniversitesi Eğitim Fakültesi Dergisi. 12 (2):23-40.
- Kışla T (2008). Özel eğitim öğretmenlerinin bilgisayar tutumlarının incelenmesi. Ege Eğitim Fakültesi Dergisi. 9(2):128-154.
- Koç M (2004). Öğretim teknolojileri ve materyal geliştirme (ed. Y. Rauf) Temel kavramlar öğretim hedefleri ve araç seçimi. Ankara: Atlas.
- Kutluca T, Ekici G (2011). Öğretmen adaylarının bilgisayar destekli eğitime ilişkin tutum ve öz-yeterlik algılarının incelenmesi. Hacettepe Üniversitesi Eğitim Fakültesi Dergisi. 38:177-188.
- Oktaş Y, Çakır R (2012). İlköğretim öğretmenlerinin teknoloji kullanımları ve teknolojiye yönelik tutumları arasındaki ilişkinin incelenmesi. X. Ulusal Fen Bilimleri ve Matematik Eğitimi Kongresi. 27-30 Haziran.Niğde.
- Pala A (2006). İlköğretim Birinci Kademe Öğretmenlerinin Eğitim Teknolojilerine Yönelik Tutumları. Celal Bayar Üniversitesi Eğitim Fakültesi Sosyal Bilimler Dergisi. 16:177-188.
- Renshaw CE, Taylor HA (2000). The educational effectiveness of computer-based instruction. Computers and Geosciences 26:677-682.
- Roblyer MD (2003). Integrating educational technology into teaching. Upper Saddle River: Merrill Prentice Hall.
- Şahin A, Akçay A (2011). Türkçe öğretmeni adaylarının bilgisayar destekli eğitime ilişkin tutumlarının incelenmesi. Turkish Studies-International Periodical For The Languages, Literature and History of Turkish or Turkic. 6 (2):909-918.
- Teo T (2008). Pre-service teachers' attitudes towards computer use: A Singapore survey. Australasian J. Educ. Technol. 24(4):413-424.
- Teo T, Chai CS, Hung D, Lee CB (2008). Beliefs about teaching and uses of technology among pre-service teachers. Asia-Pacific J. Teacher Educ. 36(2):165-176.
- Tomei LA (2005). Taxonomy for the technology domain. USA: Information Science Publishing.
- Van Braak J (2001). Individual characteristics influencing teachers' class use of computers. J. Educ. Comput. Research. 25(2):141-157.
- Yalçınalp S, Geban Ö, Özkan Ö (1995). Effectiveness of using computer-assisted supplementary instruction for teaching the mole concept. J. Res. Sci. Teach. 32:1083-1095.
- Yılmaz İ, Ulucan H, Pehlivan S (2010). Beden Eğitimi Öğretmenliğinde Öğrenim Gören Öğrencilerin Eğitimde Teknoloji Kullanımına İlişkin Tutum ve Düşünceleri. Ahi Evran Üniversitesi Eğitim Fakültesi Dergisi. 11(1):105-118.
- Yılmaz N, Alıcı Ş (2011). Investigating pre-service early childhood teachers' attitudes towards the computer based education in science activities. Turk. Online J. Educ. Technol. (TOJET).10(3):161-167.