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

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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 (Akoyunlu, 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...
in lesson by drawing their attention (Yalin, 2003). Individuals educated in such an environment will be able to 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; Yilmaz 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; Galanouli 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; Kütluca 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.

<table>
<thead>
<tr>
<th>Possession of a personal computer</th>
<th>n</th>
<th>Mean</th>
<th>Sd</th>
<th>Df</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>3358</td>
<td>156.04</td>
<td>19.90</td>
<td>5118</td>
<td>.637</td>
<td>.524</td>
</tr>
<tr>
<td>No</td>
<td>1762</td>
<td>155.67</td>
<td>19.66</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Duration of computer possession</th>
<th>n</th>
<th>Mean</th>
<th>Sd</th>
<th>Df</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-4 years</td>
<td>2230</td>
<td>154.62</td>
<td>19.63</td>
<td>5118</td>
<td>4.080</td>
<td>.00</td>
</tr>
<tr>
<td>5 years or more</td>
<td>2890</td>
<td>156.90</td>
<td>19.91</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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 (\(X = 156.04\)) are more positive than those of the pre-service teachers not having a personal computer (\(X = 155.67\)). 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.

<table>
<thead>
<tr>
<th>Variable</th>
<th>n</th>
<th>Mean</th>
<th>Sd</th>
</tr>
</thead>
<tbody>
<tr>
<td>Every day</td>
<td>2541</td>
<td>155.67</td>
<td>20.30</td>
</tr>
<tr>
<td>2 or 3 days in a week</td>
<td>1837</td>
<td>156.54</td>
<td>19.12</td>
</tr>
<tr>
<td>One day in a week</td>
<td>531</td>
<td>155.72</td>
<td>19.41</td>
</tr>
<tr>
<td>One day in a month</td>
<td>211</td>
<td>153.73</td>
<td>20.39</td>
</tr>
</tbody>
</table>

Variance Source | Mean rank | df | Sum of ranks | F  | p   | Difference LSD |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Between-groups</td>
<td>1884.82</td>
<td>3</td>
<td>628.275</td>
<td>1.599</td>
<td>.187</td>
<td>----</td>
</tr>
<tr>
<td>Within-groups</td>
<td>2009698.19</td>
<td>5116</td>
<td>392.826</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>2011583.01</td>
<td>5119</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Variable</th>
<th>n</th>
<th>Mean</th>
<th>Sd</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Not good</td>
<td>767</td>
<td>154.74</td>
<td>19.50</td>
</tr>
<tr>
<td>(2) Good</td>
<td>3359</td>
<td>156.84</td>
<td>19.44</td>
</tr>
<tr>
<td>(3) Very good</td>
<td>994</td>
<td>153.67</td>
<td>21.08</td>
</tr>
</tbody>
</table>

Variance Source | Mean Rank | df | Sum of Ranks | F  | p   | Difference LSD |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Between-groups</td>
<td>8971.41</td>
<td>2</td>
<td>4485.70</td>
<td>11.462</td>
<td>.000</td>
<td>1-2; 2-3</td>
</tr>
<tr>
<td>Within-groups</td>
<td>2002611.60</td>
<td>5117</td>
<td>391.36</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>2011583.01</td>
<td>5119</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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 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 “very 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


