

# The Attitudes of Physical Education and Sport Students towards Information and Communication Technologies

By Zekeriya Goktas  
Balikesir University

## Abstract

Studies that examine the attitudes toward information and communication technologies (ICT) among physical education and sport students, pre-service teachers and teachers are fairly limited, even though the investments in information and communication technologies at schools and universities have reached an efficient level. This study investigates the attitudes of physical education and sport students and pre-service teachers towards ICT, and the relationship between their attitudes and certain variables such as age, gender, departments, computer familiarity, frequency of computer use and computer ownership. Computer attitude scales were administered to 337 students and pre-service teachers of physical education and sports, and the data collected were analyzed statistically. It was found that the students and pre-service teachers of physical education and sports have positive attitudes toward information and communication technologies, and there are significant correlations between their attitudes and certain variables such as gender, grade, computer ownership, and computer instruction. Recommendations are provided.

**Keywords:** Physical education and sports; attitudes; information communication technologies

**R**apid developments in information and communication technologies (ICTs) have resulted in a society that can adapt well to such developments. As the human factor plays

an important role in the use, prevalence and instruction of generated information, human resources constitute one of the cornerstones of the information society. The impact of ICTs in our daily lives has been steadily increasing, which has, in turn, influenced the change in attitudes toward ICTs. Similarly, rapid developments in science and technology influence education systems and other fields. It is therefore evident that ICTs necessitate the implementation of new technologies into the education system to improve the quality of education (Akkoyunlu and Tuğrul, 2002; Aktümen and Kaçar, 2003). However, the integration of technology into the school curriculum is a complex and challenging process (Cooper, 1998) that requires taking into account numerous socio-technical factors such as teachers' computer skills as well as their confidence and attitudes toward ICTs, the use of ICTs in the teaching and learning process, the technology infrastructure within the school, and the school environment (Papanastasiou, and Angeli, 2008).

Before discussing the attitudes of physical education and sports students toward ICTs, it is beneficial to present some basic information about ICTs. It is clear that new technologies have been used in every field of education. Computers enable students to study individually, and to overcome disadvantages that may arise from their individual differences. Thus, computers provide fast and permanent learning using elements such as sound and animation. In addition, the Internet facilitates access to and

sharing of information (Varol, 1999). Thus, incorporating ICTs, particularly the Internet, into teaching and learning in higher education has become an important issue in both economically developed and rapidly developing countries (Li and Kirkup, 2007).

Many countries consider ICTs a potential means for changes and innovations in the field of education (Eurydice, 2001; Papanastasiou and Angeli, 2008), and huge investments have been made to incorporate ICTs into these countries' educational institutions. For example, Turkey allocated 11.7 % of its budget to ICTs, an equivalent of \$400 per capita, in 2006. However, this amount is less than the amount allocated by European and Central Asian countries, which allocated 22% of their budget to ICTs, but higher than the amount spent by developing countries (The World Bank, 2007). The number of Internet and personal computer users has been increasing gradually, although the level of use continues to be low in developing countries. According to research carried out by the Turkish Statistical Institute, only 3% of the 21 million primary school students use the Internet, compared to 69% of the 3.5 million university graduates. These research results clearly indicate that Internet use increases education levels (State Institute of Statistic, 2008).

Currently, the Turkish Ministry of National Education is attempting to disseminate ICTs in schools for innovation in the education system and to better address educational problems. In accordance with the objectives of EU Lisbon Summit 2002, information based economy and the digital knowledge of the society has improved in schools (Commission of European Communities, 2000). To this end, computer labs and Internet connections are now readily available in schools. Internet connections in schools, for example, have increased from 40% in 2005 (World Bank) to 68% in 2006 (SPO, 2008). Furthermore, 67% of 520,000 teachers enrolled in computer courses in 2001. Apart from the instruction at local levels, the Ministry of National Education also financed 6412 computer labs and delivered 124,000 computers to schools. By the end of 2007, the number of computers in schools had increased to 604,000. Under the current plans, 87% of the 45,973 formal education schools (MNE, 2002; 2008a; 2008b) and 96% of the students in these schools will be given access to the Internet in 2010 (SPO, 2006). In sum, investments in ICTs are included in the policies of both developing and developed countries as these countries now recognize the need raise individuals equipped with the knowledge of information technologies

(Tondeur, van Braak and Valcke, 2007).

In a broader sense, although the use of ICTs undoubtedly offers new educational experiences for both teachers and students, how teachers and students perceive such reform efforts – their thoughts and experiences about ICTs, their levels of ICTs knowledge, their attitudes toward instructional applications and their expectations – are important factors in the plan for increasing ICTs in education (Lim, and Khine, 2006; Schug, 1988; Smerdon et al., 2000; Kozma, 2003; Thomas and Stratton, 2006). In other words, successful integration of computers into educational settings depends, to a great extent, on teachers' and students' attitudes toward ICTs and computers (Selwyn, 1999). It is clear that the investments in ICTs require integrations of programs in classrooms and orienting students toward determining their knowledge and their attitudes toward these technologies.

The studies indicate that teachers' attitudes can be defined as either positive or negative with respect to computer technologies and computer supported applications (Smith, Caputi and Rawstorne, 2000). The earliest research that examined attitudes toward computers was conducted by Lee (1970), who identified two dimensions of attitude: (1) the beliefs in the computer as a beneficial tool and (2) beliefs that computers are autonomous entities. Furthermore, the studies demonstrate that there are several factors that affect the use of ICTs and attitudes of an individual toward ICTs. Among those factors, we consider the knowledge level of teachers about ICTs (Aral and Ayhan, 2006; Aydin, 2007; Teo, Chai, Hug and Lee, 2008a), demographic factors such as gender, age, years of teaching experience (Hartley, and Bendixen, 2001), teachers' levels of self-efficacy, anxiety, and beliefs (Hong and Koh, 2002; Paraskeva, Bouta, and Papagianni, 2008; Teo, Chai, Hug and Lee, 2008a), teachers' experience with the use of ICTs (İşman, Evirgen and Çengel, 2008; ; Paraskeva, Bouta, and Papagianni, 2008), their learning and teaching styles (Niederhauser and Storddart, 2007; Teo, Chai, Hug and Lee, 2008b), and their frequency of access to ICTs (Hong and Koh, 2002). However, a significant point is that studies on the attitudes of physical education and sports teachers toward ICTs seem fairly limited. To provide a few examples of this limited number of studies, Yaman (2007) investigated the attitudes of Turkish physical education and sports teachers towards the Internet, and Bebetos and Antoniou (2009) examined the relationship between the attitudes and some factors such as gender, computer use,

and physical activities of Greek students. As a final note, in recent years, ICTs have been gaining increasing importance in Physical Education (PE) and Sport Science (SS) and have become an integral part of the physical education curriculum and instruction as well as of the everyday work of physical education teachers, athletic coaches and sport managers (Kocak, 2003)

As mentioned above, there exist certain factors influencing the attitudes toward ICTs. One of the main issues regarding the attitudes of physical education and sports teachers toward ICTs was identified to be gender. Research results show that males have better ICT skills, use ICTs more in their leisure time, have more positive attitudes than females, and take on more independent challenges for learning ICTs (Hakkarainen et al., 2000; Papastergiou and Solomonidou, 2005). The study of Palaigeorgiou, Siozos, Konstantakis and Tsoukalas (2005) also confirmed that both men and women had similar engagement with computers and were concerned about the future impact of continuous computer use, but women were more anxious about hardware usage and assessed less positively the consequences of computers in their personal and social life.

Three factors guided the present study: First, though there have been ICT investments at schools and universities, ICT instruction in terms of pre- and in-service teacher education is a problematic area. In a broader sense, political and strategic steps need to be taken with respect to ICTs instruction. Second, although the issues mentioned above have been investigated on a global level, the research activities related to ICTs instruction of physical education and sport students, pre-service teachers and teachers are fairly limited in Turkey. In addition, it should be noted that the studies conducted in Turkey have mainly focused on the relationship between the attitudes toward ICTs and certain variables, such as gender and age. Thus, this study aims to investigate additional independent variables, including ICT familiarity and computer ownership. Finally, the studies mainly examined sample groups consisting of students, and pre-service teachers and teachers have not been included in the sampling. Because of the reasons above, the present study aims to investigate the level of attitudes of physical education and sport students and pre-service teachers and the relationship between their attitudes and certain variables such as age, gender, departments, computer familiarity and frequency of computer use and computer ownership. Therefore, in the study, two research questions were asked:

1. What are the attitudes of physical and sports students and pre-service teachers?
2. Is there a relationship between the attitudes and the variables of age, gender, departments, computer familiarity, instruction, and frequency of computer use and computer ownership?

## Method

The population of the study consisted of 337 freshmen, sophomores, juniors, and seniors at the Departments of Physical Education and Sports, Coaching Education and Sports Management in Balıkesir, Turkey. Their age range was between 18 and 30, with a mean age of 21.49 years. The sample included 202 males (59.9%) and 135 females (40.1%). Of the 337 students, 45.7% (154) were in the Physical Education and Sport Department; 28.8% (97) of the students were in the Coaching Education Department, and 25.5% (86) of the students were in the Sport Management Department. With respect to class, 74 (22%) were freshmen, 104 (30.9%) of the students were sophomores, 80 (23.7%) were juniors, and 79 (23.4%) were seniors. Their average computer use in years was 8.35 years. The average number of computers in school labs was 7.69. Eleven (3.3%) student participants stated they had computers in their class, whereas 326 (96.7%) students claimed they did not have a computer in class. A large majority of the participants, 267 (79.2%), had computers at home and 70 (20.8%) students did not have a computer at home. With respect to computer education, 179 (53.1%) of the students, slightly more than half, stated that they had received computer education and 158 (46.9%) of the students stated that they had not received computer instruction.

In the study, the computer attitude scale (CAS) developed by Papanastasiou and Angeli (2008) was used as the data collecting instrument. The scale measures teachers' beliefs about the computer and the Internet's value in educational use. It is a Likert-type scale that ranges from 1 to 4 (1 = completely disagree to 4 = completely agree). The CAS consists of 15 items developed by Papanastasiou and Angeli (2008). First, the scales were translated into Turkish. Then, the translation was scrutinized by field experts and linguists who examined both Turkish and English versions. In the study, gender, age, department, grade, computer familiarity, and computer instruction were selected as the independent variables.

After piloting the study, the scale was administered to the sample group. Kaiser-Meyer-Olkin (KMO) coefficients were .815 and .865,

and the Barlett Sphericity test values of the two scales were significant ( $p < 0.000$ ). The results of Varimax rotation performed on the CAS revealed two factors that explained 56.946% of the variance in these 15 items. The factor numbers were the same, but item numbers and items in factor results were different from those calculated by Papanastasiou and Angeli (2008). The first factor, which explained 30.96% of the variance, is composed of 7 items, and the second factor, which explains 25.98% of variance, is composed of 8 items. The alpha reliability coefficient of the CAS was calculated at .92. The Cronbach coefficients of sub-scales were .93 and .93. Finally, variance analysis, correlation analysis, and T-tests were used to reveal the correlations.

## Findings

The mean scores for the students' attitudes are given in table 1. The highest attitude mean value belongs to the item "The computer is a valuable tool for students" (mean= 3.42). The second highest attitude mean value belongs to "I feel comfortable with the idea of the computer as a tool in learning" (mean=3.31) followed by "The computer helps me learn because it allows me to express my thinking in better and different ways" (mean=3.20). The students were all positive in these three attitudes. The negatively-worded attitude statements have lower mean scores, but these scores are interpreted positively. For example, "The use of computers scares me" (mean=1.73) and "The computer is not conducive to good learning because it creates technical problems" (mean=2.29).

The students had negative attitudes toward the statement "I can do what the computer can do equally as well" (mean=1.82). This means that the students appreciate the importance of computers. The remainder of the attitude means seems moderately positive.

## Correlations among Age and Attitudes

Correlation analysis indicates both the strength and the direction of the relationship between variables. For example, as can be seen in Table 2, "The computer is not conducive to good learning because it creates technical problems" and "I do not use computers because they are not easy to use" are moderately-highly and positively correlated ( $r = 0.70$ ). Correlations among age and attitudes are low; there is no significant correlation between age and attitudes at the 0.001 level. The correlation between "I feel comfortable with the idea of the computer as a tool in learning" and "The use of computers in learning activities prevents me from getting stressed"

Table 1. The Attitudes of the Students of the School of Physical Education and Sport Toward Computers

Statements (N=337)	Mean	Std. Deviation
1. I feel comfortable with the idea of the computer as a tool in learning.	3.31	.70
2. The use of computers in learning activities prevents me from getting stressed.	3.03	.84
3. If something goes wrong with the computer, I know how to fix it.	2.79	.90
4. I am skeptical of the idea of learning and using a computer.	2.10	.82
5. The use of the computer as a learning tool excites me.	2.82	.87
6. The use of computers scares me.	1.73	.83
7. The computer is a valuable tool for students.	3.42	.73
8. The computer will change the way I learn.	2.81	.95
9. I can do what the computer can do equally as well.	1.82	.80
10. I do not use computers because they are not easy to use.	2.04	1.13
11. The computer helps me understand concepts in more effective ways.	3.06	.78
12. The computer helps me learn because it allows me to express my thinking in better and different ways.	3.20	.73
13. The computer helps students learn in more effective ways.	3.00	.77
14. The computer is not conducive to good learning because it creates technical problems.	2.29	1.08

4-point scale (1=completely disagree, 2=disagree, 3=agree, 4=completely agree).

Table 2. Correlations among variables

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Age	1														
2. I feel comfortable with the idea of the computer as a tool in learning.	-.03	1													
3. The use of computers in learning activities prevents me from getting stressed.	-.04	.58	1												
4. If something goes wrong with the computer, I know how to fix it.	-.02	.28	.35	1											
5. I am skeptical of the idea of learning and using a computer.	.03	.04	.18	.04	1										
6. The use of the computer as a learning tool excites me.	-.13	.36	.37	.23	.10	1									
7. The use of computers scares me.	-.10	-.08	-.07	-.23	.43	-.04	1								
8. The computer is a valuable tool for students.	.02	.36	.32	.12	.00	.36	-.24	1							
9. The computer will change the way I learn	-.04	.10	.12	.08	.10	.14	-.06	.12	1						
10. I can do what the computer can do equally as well.	-.05	.01	.04	.08	.28	.13	.30	-.15	.20	1					
11. I do not use computers because they are not easy to use.	-.13	.12	.15	.06	.27	.30	.36	.10	-.38	.19	1				
12. The computer helps me understand concepts in more effective ways.	.06	.34	.43	.20	.13	.33	-.11	.39	.08	-.02	.18	1			
13. The computer helps me learn because it allows me to express my thinking in better and different ways.	-.05	.40	.39	.23	.06	.37	-.08	.39	.08	-.06	.25	.47	1		
14. The computer helps students learn in more effective ways.	.12	.15	.14	.03	.10	-.00	.03	.17	.44	.07	.34	.18	.21	1	
15. The computer is not conducive to good learning because it creates technical problems.	-.17	.16	.20	.12	.23	.37	.24	.08	-.37	.15	.70	.19	.26	-.30	1

Correlations greater than 0.22 are significant at 0.001, and those greater than 0.11 are significant at 0.05.

is moderately positively correlated ( $r=0.58$ ). A few more correlations exist among attitudes at the 0.40 level and the rest of the correlations are moderately low.

### Gender and Attitudes

T-tests were conducted to determine whether there is correlation between the attitudes and gender. The values in the table indicated that nine items in the questionnaire had significant correlation with gender while there was no significant correlation with five statements in the questionnaire in terms of gender.

For “I feel comfortable with the idea of the computer as a tool in learning”, females (mean=3.43) have a higher mean score than males (mean=3.23), ( $t= -2.539$ ,  $p= .012$ ).

Females have higher mean scores (mean=3.26) for “The use of computers in learning activities prevents me from getting stressed” than males (mean=2.87), ( $t= -4.311$ ,  $p= 0.000$ ). Females (mean=3.00) are more excited about us-

ing computers as a learning tool than males are (mean=2.70), ( $t=-3.175$ ,  $p=0.002$ ). For “The computer is a valuable tool for students”, females (mean=3.53) have higher mean scores than males (mean=3.35), ( $t= -4.311$ ,  $p= 0.000$ ). For the statement, “The computer will change the way I learn” males (mean=2.90) have higher mean scores than females (mean=2.67), ( $t= 2.158$ ,  $p= 0.032$ ). Females (mean=2.19) have higher mean scores than males (mean=1.94), ( $t= -2.011$ ,  $p= 0.045$ ) for the statement “I do not use computers because they are not easy to use.” For “The computer helps me understand concepts in more effective ways” females (mean=3.22) have higher mean scores than males (mean=2.96), ( $t= -3.041$ ,  $p=0 .003$ ). For “The computer helps me learn because it allows me to express my thinking in better and different ways”, females (mean=3.34) have higher mean scores than males (mean=3.10), ( $t= -3.053$ ,  $p= 0.002$ ). In the last attitude statement “The computer is not conducive to good learning because it creates technical problems”, females (mean=2.55) have higher mean scores than males (mean=2.11), ( $t=-3.686$ ,  $p=0.000$ ). In conclusion, the findings indicated that gender constitutes a significant variable in terms of the attitudes towards the use of ICTs.

### Departments and Attitudes

ANOVA was performed to examine whether the attitudes of students towards computers varied according to their departments. As seen in the F-tests and in the related significance levels, significant differences were observed between the means of the students’ departments and the means of the attitudes (nine significant differences out of 14 are shown in table 4).

Turkey’s HSD post-hoc test was used to determine which attitude levels differed according to the students’ departments. These differences are shown in the last two columns. For example, for the attitude “The use of computers in learning activities prevents me from getting stressed”, physical education and sport students have significantly higher mean scores (mean=3.18) than both sport management (mean=2.88) and coaching students (mean=2.93).

### Grade and Attitudes

An analysis of variance test indicated only one significant difference between the attitudes and years of study among the students ( $F=3.92$ ,  $p=0.009$ ). According to the results of Tukey’s HSD post-hoc test for “The computer helps students to learn in more effective ways”, juniors have significantly higher mean scores (mean=3.25) than both freshmen (mean=2.86) and sophomores (mean=2.94).

Table 3. Gender and Attitudes towards Computer Use

Attitudes	Gender	N	Mean	Std. Deviation	t-value	Sig.
I feel comfortable with the idea of the computer as a tool in learning.	Male	202	3.23	.705	-2.539	.012
	Female	135	3.43	.686		
The use of computers in learning activities prevents me from getting stressed.	Male	202	2.87	.891	-4.311	.000
	Female	135	3.26	.682		
If something goes wrong with the computer, I know how to fix it.	Male	202	2.82	.877	.930	.353
	Female	135	2.73	.939		
I am skeptical of the idea of learning and using a computer.	Male	202	2.14	.792	1.110	.268
	Female	135	2.03	.867		
The use of the computer as a learning tool excites me.	Male	202	2.70	.887	-3.175	.002
	Female	135	3.00	.824		
The use of computers scares me.	Male	202	1.68	.789	-1.130	.259
	Female	135	1.79	.890		
The computer is a valuable tool for students.	Male	202	3.35	.739	-2.259	.025
	Female	135	3.53	.699		
The computer will change the way I learn.	Male	202	2.90	.897	2.158	.032
	Female	135	2.67	1.013		
I can do what the computer can do equally as well.	Male	202	1.84	.84915	.463	.644
	Female	135	1.80	.741		
I do not use computers because they are not easy to use.	Male	202	1.94	1.072	-2.010	.045
	Female	135	2.19	1.206		
The computer helps me understand concepts in more effective ways.	Male	202	2.96	.809	-3.041	.003
	Female	135	3.22	.719		
The computer helps me learn because it allows me to express my thinking in better and different ways.	Male	202	3.10	.781	-3.053	.002
	Female	135	3.34	.614		
The computer helps students learn in more effective ways.	Male	202	3.06	.740	1.871	.062
	Female	135	2.90	.818		
The computer is not conducive to good learning because it creates technical problems.	Male	202	2.11	.970	-3.686	.000
	Female	135	2.55	1.194		

## The Relationship Between Computer use by Years and Attitudes

The results of the ANOVA test demonstrate that there are two significant differences between attitudes and the duration of computer use. According to the results of Tukey's HSD post-hoc test for "I do not use computers because they are not easy to use", the students who have used computers for five years have significantly higher mean scores (mean=2.56) than the students who have used computers for ten years (mean=1.85). This means that more experienced students have less difficulty in using computers.

For "The computer is not conducive to good learning because it creates technical problems", the students who have used computers for five years have significantly higher mean scores (mean=2.75) than the students who have used computers for seven years (mean=2.02) and the students who have used computers for nine years (mean=1.77). This means that the students who have used computers for longer periods think that computers are more conducive to good learning than less experienced students do.

## The Relationship Between Computer use at Home and Attitudes

The relationship between computer use at home and attitudes T-tests were performed to determine whether computer use at home results in differences in attitude means. It was found that the means of 14 attitudes varied according to computer use at home. It was found that the means of 14 attitudes varied according to computer use at home. As seen in Table 7, for the statement "If something goes wrong with the computer, I know how to fix it", students who have a computer at home have higher mean scores (mean=2.87) than the students who do not have a computer at home (mean=2.47) ( $t= 3.359$ ,  $p=0.001$ ). Again, for the attitude "The computer helps me learn because it allows me to express my thinking in better and different ways", students who have computers at home have higher mean scores (mean=3.24) than the students who do not have a computer at home (mean=3.04) ( $t= 2.061$ ,  $p=0.040$ ).

The students who have computers at home are less likely to feel scared or anxious using computers than the students who do not have a computer at home.

## The Relationship Between Computer Courses Taken and Student Attitudes

T-tests were used to determine whether means of the attitudes and participation of stu-

Table 4. Analysis of Variance test for attitudes and departments

Items	Departments	N	Mean	F	Sig.	Difference (Turkey)	Difference p-value
The use of computers in learning activities prevents me from getting stressed.	1-Physical education and sport	154	3.18	4.68	.010	1-2	.021
	2-Sport management	86	2.88			1-3	.048
	3-Coaching	97	2.93			2-3	.931
The use of the computer as a learning tool excites me.	1-Physical education and sport	154	3.03	7.89	.000	1-2	.002
	2-Sport management	86	2.63			1-3	.006
	3-Coaching	97	2.68			2-3	.910
The computer is a valuable tool for students.	1-Physical education and sport	154	3.56	5.41	.005	1-2	.005
	2-Sport management	86	3.25			1-3	.087
	3-Coaching	97	3.36			2-3	.586
The computer will change the way I learn.	1-Physical education and sport	154	2.61	6.94	.001	1-2	.051
	2-Sport management	86	2.90			1-3	.001
	3-Coaching	97	3.04			2-3	.596
I do not use computers because they are not easy to use.	1-Physical education and sport	154	2.45	20.1	.000	1-2	.000
	2-Sport management	86	1.78			1-3	.000
	3-Coaching	97	1.64			2-3	.654
The computer helps me understand concepts in more effective ways.	1-Physical education and sport	154	3.20	4.84	.008	1-2	.054
	2-Sport management	86	2.96			1-3	.016
	3-Coaching	97	2.9278			2-3	.944
The computer helps me learn because it allows me to express my thinking in better and different ways.	1-Physical education and sport	154	3.33	4.57	.011	1-2	.039
	2-Sport management	86	3.09			1-3	.030
	3-Coaching	97	3.09			2-3	1.000
The computer helps students learn in more effective ways.	1-Physical education and sport	154	2.82	7.75	.001	1-2	.001
	2-Sport management	86	3.18			1-3	.010
	3-Coaching	97	3.11			2-3	.795
The computer is not conducive to good learning because it creates technical problems.	1-Physical education and sport	154	2.68	21.21	.000	1-2	.000
	2-Sport management	86	1.90			1-3	.000
	3-Coaching	97	2.01			2-3	.775

Table 5. ANOVA for attitudes and years of study

Attitude	Year	N	Mean	F	Sig.	Difference (Tukey)	Difference p-value
The computer helps students learn in more effective ways.	1	74	.86	3.92	.009	1-2	.910
	2	104	.94			1-3	.011
	3	80	.25			1-4	.904
						2-3	.036
	4	9	2.96			2-4	1.000
			3-4	.066			

dents in computer courses differ. The table shows that out of 14 items, the means of 9 attitudes significantly differ according to whether students had taken a computer course. There is no difference between computer instruction and the rest of items.

Table 6. ANOVA for years of computer use and attitudes

Attitudes	Year	N	Mean F		Sig.	Difference	Difference p-value
I do not use computers because they are not easy to use.	5	41 2	.56	2.50 .	.031	5-10 .	.010
	6	25 1	.96				
	7 3	8	1.97				
	8	55 2	.05				
	9	18 1	.93				
	10 9	4	1.85				
The computer is not conducive to good learning because it creates technical problems.	5	41 2	.75	3.18 .	.008	5-7	.027
	6	25 2	.16			5-9	.014
	7 3	8	2.02				
	8	55 2	.41				
	9	18 1	.77				
	10 9	4	2.29				

Table 7. T-tests for computer use at home and attitudes

Computer use at home and attitudes	Do you have a computer at home?	N	Mean	Standard Deviation	t-value	p-value
If something goes wrong with the computer, I know how to fix it.	Yes	267 2	.87	.887	3.359 .	.001
	No 7	0	2.47 .	.896		
The use of computers scares me.	Yes	267 1	.68	.817	-2.093 .	.037
	No 7	0	1.91 .	.863		
The computer helps me learn because it allows me to express my thinking in better and different ways.	Yes	267 3	.24	.723	2.061 .	.040
	No	70 3	.04	.731		

For all attitude means, students who have taken computer courses have higher mean scores than the students who have not taken computer courses. If one wants to indicate this in a statistical term, for example, for the attitude of “I feel comfortable with the idea of the computer as a tool in learning”, students who have taken computer courses (mean=3.44) have higher mean scores than those who have not (mean=3.16), ( $t=3.671$ ,  $p=0.000$ ). For the negatively-worded statement, “The use of computers scares me”, the students who have taken a computer course are less likely to feel anxious using computers than the students who have not taken a computer course.

## Conclusions and Discussion

The following conclusions were reached based on the study: First, physical education and sport students have mainly positive attitudes toward computers. Second, age does not have a significant effect on the attitudes of physical education and sport students toward computers. Third, gender is a significant factor that affects the attitudes towards computers. Interestingly enough, female students have more positive attitudes toward computers than their male counterparts. On the other hand, a finding in one item suggests that male students believe more strongly that computers will change their way of learning. Furthermore, it was found that the students’ grade is a significant factor that affects the attitudes in terms of stress among coaching students. Fourth, it was shown that computer experience in years helps students use the computer easier and learn better. It was also found that computer ownership reduces stress, improves thinking skills and encourages students to learn how to fix computers. Finally, those students who received computer instruction feel comfortable when they use computers as a learning tool, feel less stressed during computer use, are capable of fixing their computers in case of a technical problem, believe the computer is a valuable learning tool and that it can improve their thinking and conceptual skills.

Below, some implications are presented for a brief comparison of the study’s findings to the results of previous studies. First, as found by Lee (1970), the results in the study reveal that physical education and sport students have positive attitudes toward computers and believe the computer is a beneficial learning tool. Furthermore, it was determined that factors such as gender, age, and years of teaching experience affect attitudes toward computers, as previously found by Aral and Ayhan (2006) and Aydın (2007). In addition to the results of the limited studies (Yaman, 2007; Bebetos and Antoniou, 2009) that used physical education and sport students as sample groups, the present study also found that computer familiarity and computer ownership are significant factors that affect attitudes. Finally, the results of the present study indicate that female students have more positive attitudes toward computers, though prior studies have shown that female learners have less positive attitudes than males, a finding reported by Palaigeorgiou, Siozos, Konstantakis and Tsoukalas (2005).

In relation to the conclusions of this study, some recommendations can be noted. First,

since physical education and sport students have positive attitudes towards computers, educators need to improve the use of ICTs in educational settings and incorporate ICTs as a regular part of the physical education and sport management curriculum. In other words, educators should be aware of the positive attitudes towards the use of ICT, and seek the ways of integrating into their educational settings. Moreover, they need to use educational software, applications and games to support their educational activities. By using ICTs in teaching and learning context, it will be possible to enable students to acquire required skills and knowledge to be successful in their careers. Second, because ICTs are evolving at an ever-increasing pace, continuous effort should be made to increase the use of ICTs in the schools. That is, as the students in the department are mainly planning to become teachers in their future life, not only the educators should focus on only using ICTs in learning activities but giving instruction on the integration of ICTs on teaching context. Third, it is suggested that educational and training programs conducted by ICT experts would enhance physical education and sport students knowledge and expertise in the area of ICT. In other words, software developers should work on software that can be used in both teaching and learning environments. This will be very helpful to facilitate future sport management educators in preparing their own educational style and materials, a much-needed skill in this information and technology laden era.

The study is limited to 337 physical education and sport students studying at Balıkesir University. It is also limited to the computer attitude scale developed by Papanastasiou and Angeli (2008). Finally, the independent variables examined in the study include gender, age, department, grade, computer familiarity, and computer instruction. Further studies are needed in the same area using different samples so that more valid and reliable conclusions may be drawn.

**Zekeriya Göktaş (Ph.D.)** is an assistant professor in the Department of Physical Education at Balıkesir University. His research has mainly been in personal and professional qualities, individual differences, and technology in physical education. His articles have appeared in national and international journals. Göktaş teaches courses for pre-service English teachers. Correspondences can be addressed to: Zekeriya Göktaş, Balıkesir Üniversitesi, Beden Eğitimi ve Spor Ülkokulu, 10100 Balıkesir Turkey; Phone: 00 90 266, 239 18 38, 00 90 532 568 50 78; Fax: +90 266 239 02 85; E-mail: [zgoktas@balikesir.edu.tr](mailto:zgoktas@balikesir.edu.tr)

Table 8. T-test for computer courses and attitudes

Attitudes	Have you taken computer courses?	N	Mean	Standard Deviation	t-value	p-value
I feel comfortable with the idea of the computer as a tool in learning.	Yes	179	3.44	.654	3.671	.000
	No	158	3.16	.730		
The use of computers in learning activities prevents me from getting stressed.	Yes	179	3.18	.824	3.61	.000
	No	158	2.86	.817		
If something goes wrong with the computer, I know how to fix it.	Yes	179	3.03	.850	5.647	.000
	No	158	2.50	.879		
The use of the computer as a learning tool excites me.	Yes	179	2.96	.914	3.078	.002
	No	158	2.67	.801		
The use of computers scares me.	Yes	179	1.62	.742	-2.603	.010
	No	158	1.85	.908		
The computer is a valuable tool for students.	Yes	179	3.54	.712	3.353	.001
	No	158	3.28	.723		
The computer helps me learn because it allows me to express my thinking in better and different ways.	Yes	179	3.31	.737	3.171	.002
	No	158	3.06	.696		
The computer is not conducive to good learning because it creates technical problems.	Yes	179	2.46	1.191	3.097	.002
	No	158	2.10	.918		
The computer helps me understand concepts in more effective ways.	Yes	179	3.17	.772	2.858	.005
	No	158	2.93	.779		

## References

- Akkoyunlu, B., Tuğrul, B. (2002). Okul öncesi çocuklarının ev yaşantısındaki teknolojik etkileşimlerinin bilgisayar okuryazarlığı becerileri üzerindeki etkisi [The effect of preschool children's technological interactions at home on their computer literacy skills]. *Hacettepe Üniversitesi Eğitim Fakültesi Dergisi*, 23, 12-21.
- Aktümen, M., Kaçar, A. (2003). İlköğretim 8. sınıflarda harfli ifadelerle işlemlerin öğretiminde bilgisayar destekli öğretimin rolü ve bilgisayar destekli öğretim üzerine öğrenci görüşlerinin değerlendirilmesi [The role of computer-assisted teaching in the instruction of statements in letters and operations among 8<sup>th</sup>-grade primary school students and an evaluation of student opinions about computer-assisted teaching]. *Kastamonu Eğitim Dergisi*, 2, 339-358.
- Aral, N., Bütün-Ayhan, A., Ünlü, Ö., Erdoğan, N., and Unal, N. (2006). Anaokulu ve anasınıfı öğretmenlerinin bilgisayara yönelik tutumlarının incelenmesi [Determining the attitudes of preschool and kindergarden teachers towards computers], *Elektronik Sosyal Bilimler*, 5(17), 25-32. Retrieved from: <http://www.e-sosder.com/dergi/1725-32.pdf>



- Aydin, S. (2007). Attitudes of EFL learners towards the Internet. *The Turkish Online Journal of Educational Technology – TOJET*, 6 (3), 18 – 26.
- Bebetsos, E and Antoniou, P. (2009). Gender differences on attitudes, computer use and physical activity among Greek university students, *The Turkish Online Journal of Educational Technology – TOJET* April 2009 ISSN: 1303-6521 volume 8 Issue 2 Article 6
- Cooper, J. R. (1998). A multidimensional approach to the adoption of innovation. *Management Decision*, 36(8), 493–502.
- Commission of European Communities (2000). Communication from the commission: e-Learning-designing tomorrow's education. Brussels, 24. 5. 2000, 318 final. Retrieved from: <http://ec.europa.eu/education/archive/elearning/comen.pdf>
- Eurydice. (2001). ICT@Europe.edu: Information and communication technology in European education systems. Eurydice: the information network on education in Europe. Retrieved from: <http://www.mszs.si/eurydice/pub/eurydice/ICTpdf>
- Hartley, K. and Bendixen, L. D. (2001). Educational research in Internet age: examining the role of individual characteristics. *Educational Researcher*, 30(9), 22-26.
- Hakkarainen, K., Ilomaki, L., Lippinen, L., Muukonen, H., Rahikainen, M., and Tuominen, T.(2000). Students' skills and practices of using ICT: results of a national assessment in Finland. *Computers and Education*, 34, 103-117.
- Hong, K-S. and Koh, C. K., (2002). Computer anxiety and attitudes towards computers among rural secondary school teachers: A Malaysian Perspective. *Journal of Research on Technology on Education*, 35(1), 27-48.
- İşman, A., Evrigen, H. and Çengel, M. (2008). Sakarya ili milli eğitim müdürlüğünde çalışan öğretmenlerin internet kullanma bariyerleri [The barriers of Internet use of the teachers employed in the directorate of national education in Sakarya]. 8<sup>th</sup> *International Educational Technology Conference Proceedings*. Retrieved from: <http://ietc2008.home.anadolu.edu.tr/ietc2008/29.doc>
- Kocak, S. (2003). Computer attitudes and competencies in physical education and sport. *International Council for Health, Physical Education, Recreation, Sport and Dance*, 39(1), 49–52.
- Kozma, R. B. (ed.) (2003). Technology, innovation, and educational change: A global perspective. Eugene, OR: *International Society for Technology in Education*.
- Lee, R. (1970). Social attitudes and the computer revolution. *Public Opinion Quarterly*, 34(1), 53–59.
- Li, N. and Kirkup, G. (2007). Gender and cultural differences in Internet use: A study of China and the UK. *Computers and Education*, 48, 301–317.
- Lim, C.P., and Khine, M. S. (2006). Managing teachers' barriers to ICT integration in Singapore schools. *Journal of Technology and Teacher Education*, (14)1, 97-125.
- Ministry of National Education (MNE) (2002). Education statistics of 2002 year. Retrieved from: <http://www.meb.gov.tr/stats/apk2002/61.htm>
- Ministry of National Education (MNE) (2008a). The project of Internet access (Internet erişim projesi). Retrieved from: [http://www.meb.gov.tr/ADSL/adsl\\_index.html](http://www.meb.gov.tr/ADSL/adsl_index.html)
- Ministry of National Education (MNE) (2008b). Education statistics. Retrieved on October 15, 2008 from: <http://www.meb.gov.tr>
- Palaigeorgiou, G. E., Siozos, P. D., Konstantakis, N. I., and Tsoukalas, I. A. (2005). A computer attitude scale for computer science freshmen and its educational implications. *Journal of Computer Assisted Learning*, 21(5), 330–342.
- Papanastasiou, E. C., and Angeli, C. (2008). Evaluating the use of ICTs in education: psychometric properties of the survey of factors affecting teachers teaching with technology (SFA-T3). *Educational Technology and Society*, 11 (1), 69-86.
- Papastergiou, M., and Solomonidou, C. (2005). Gender issues in Internet access and favourite Internet activities among Greek high school pupils inside and outside school. *Computers and Education*, 44, 377–393.
- Paraskeva, F., Bouta, H., and Papagianni, A. (2008). Individual characteristics and computer self-efficacy in secondary education teachers to integrate technology in educational practice. *Computers and Education*, 50, 1084–1091.
- Schug, M.C. (1988). What Do Social Studies Teachers Say About Using Computers? *In The Social Studies*. 112-115.
- Selwyn, N. (1999). Students' attitudes towards computers in sixteen to nineteen education. *Education and Information Technologies*, 4(2), 129–141.
- Smerdon, B., Cronen, S., Lanahan, L., Anderson, J., Iannotti, N., and Angeles, J. (2000). Teachers' tools for the 21<sup>st</sup> century: A report on teachers' use of technology. Statistical Analysis Report. (ERIC Document Reproduction Service No. ED 444 599).
- Smith, B., Caputi, P., and Rawstorne, P. (2000). Differentiating computer experience and attitudes toward computers: An empirical investigation. *Computers in Human Behavior*, 16(1), 59–81.
- State Institute of Statistic (SIS) (2008). ICT usage survey on household and individuals 2008. Information Bulletin, 138. Retrieved from: [http://www.tuik.gov.tr/PreTablo.do?tb\\_id=60andust\\_id=2](http://www.tuik.gov.tr/PreTablo.do?tb_id=60andust_id=2)
- State Planning Organization (SPO) (2006). Information society strategy 2006-2010. Ankara: State Planning Organization. Retrieved from: [http://www.bilgitoplumu.gov.tr/eng/docs/Information%20Society%20Strategy\\_Turkey.pdf](http://www.bilgitoplumu.gov.tr/eng/docs/Information%20Society%20Strategy_Turkey.pdf)
- State Planning Organization (SPO) (2008). OECD-IT Policy Questionnaire 2008-Turkey. Retrieved from: <http://www.bilgitoplumu.gov.tr/yayinlar.asp>.
- Teo, T., Chai, C. S., Hung, D., and Lee, C. B. (2008a). Beliefs about teaching and uses of technology among pre-service teachers. *Asia Pacific Journal of Teacher Education*, 36(2), 165-176.
- Teo, T., Lee, C.B., and Chai, C. S. (2008b). Understanding pre-service teachers' computer attitudes: Applying and extending the Technology Acceptance Model (TAM). *Journal of Computer-Assisted Learning*, 24, 128–143.
- Thomas, A., and Stratton, G. (2006). What we are really doing with ICT in physical education: A national audit of equipment, use, teacher attitudes, support, and training. *British Journal of Educational Technology*, 37(4), 617-632.
- Tondeur, J., van Braak, J. and Valcke, M. (2007). Curricula and the use of ICT in education: Two worlds apart. *British Journal of Educational Technology*, 38(6), 962-976.
- Varol, A. (1999) "Bilişim alanındaki eğitimcilerin eğitimi" [Educating the educators in the information field], *btie'99, bilişim teknolojileri ışığında eğitim konferansı ve sergisi* [A conference and exhibition on education in the light of information technologies], 13-15 May 1999, *Bildiriler Kitabı*, S:99-104, Ankara.
- Yaman, M. (2007) The attitudes of the physical education students towards The Internet, *The Turkish Online Journal of Educational Technology - TOJET* July 2007 ISSN: 1303-6521 Volume 6, Issue 3, Article 8.
- The World Bank (2007). 2007 world development indicator. Washington, D.C.: The World Bank. Retrieved from: <http://www.worlddeconomy.org.cn/UploadFiles/2008351252658.pdf>.