

Investigation of Teachers' Computer Usage Profiles and Attitudes toward Computers

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Abstract

The purpose of this study is to determine the status of computer usage and the attitudes toward computers of teachers and to investigate of several variables on their attitudes. For this purpose, "Information form about using computer" and "Scale of the attitudes for computers" was applied to 172 teachers. This study was conducted with survey methods). The data is analyzed through standard deviation and mean value as well as t-test and one way ANOVA for group comparison, besides to find which group causes the difference in the group comparison, a post hoc Tukey HSD test is employed. At the end of the study it is determined that the teachers use computers more at home and internet cafes and their levels of using computer programme are intermediate or upper. It is also determined that there is a significant difference according to the variables of taking computer classes, having a computer, level of using a computer, frequency of using computer, experience of using computer and class of the scores of attitudes toward computers.

Keywords: Computer attitudes, computer usage, teachers

INTRODUCTION

The use of computers in education is steadily increasing. In this context, it is essential for educational researchers to investigate the extent of computer integration and the factors influencing computer implementation. The actual use of computers in education can be defined and determined in different ways. Many researchers measure computer use by reporting the percentage of teachers who use computers in their classroom, or the amount of technology used in the classroom, or the time teachers and pupils spend working with computers, etc (Hsu, Wu and Hwang, 2007; Tondeur, Van Braak and Valcke, 2007). Although these indicators are valuable, they hardly help to understand the educational use of computers in the classroom.

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Specifically, for the appropriate use of computers in school education, teachers should be able to select and use developmentally appropriate programs and make use of the computers in promoting the development fields of the students. Teachers must play an important role in using computers to enhance the learning of children. In this way, prospective teachers and teachers become an important element in the education of students in the use of computers. For this reason, the faculties of education in which teachers are trained turn out to be important in that teachers should develop positive attitudes towards computer use and should be able to make the most of computers in education.

Attitude is one of the determining factors in predicting people's behavior. That is to say by understanding an individual's attitude towards something, one can predict with high precision the individual's overall pattern of behavior to the object (Ajzen and Fishbein, 1977: as cited in Yushau, 2006). Attitude has been defined as "a learned predisposition to respond positively or negatively to a specific object, situation, institution, or person" (Aiken, 2000: as cited in Yushau, 2006). Therefore, attitude affects people in everything they do and in fact reflects what they are, and hence a determining factor of people's behavior (Yushau, 2006). Computer attitude has been defined as a person's general evaluation or feeling of favour or antipathy toward computer technologies and specific computer related activities (Smith, Caputi and Rawstorne, 2000). Computer attitude evaluation usually encompasses statements that examine users' interaction with computer hardware, computer software, other persons relating to computers, and activities that involve computer use. Computer-related activities examined are either single instances of behavior (e.g. specific software use) or classes of behavior (e.g. attaining computer related courses) (Smith, Caputi and Rawstorne, 2000). Various computer attitudes scales have been developed (e.g. Selwyn, 1999; Smith, Caputi and Rawstorne, 2000) but the Computer Attitudes Scale developed by Loyd and Gressard (1984) is one of the most often applied scales to undergraduate students. Computer attitudes are influenced by different variables. Examples from recent research include computer training (Tsitouridou and Vryzas 2003), gender (Bebetsos and Antoniou, 2009), knowledge about computers

(Derscheid, 2003), computer anxiety (Savenye, 1993; McInerney, McInerney and Sinclair, 1994), liking (Deniz, 2007) and computer experience (Sadık, 2006). In most cases, many of these factors interact with one another to impact on attitude towards computers. Several studies reveal that one of the significant problems about the use of computers in educational settings is the teachers' ineptness at computer use (Sadık, 2006). Therefore it is essential to make the users aware of their attitudes toward computer for successful education and teaching. So as to obtain effective results from the computer education that is or will be implemented in educational institutes, the computer attitudes of teachers and pre-service teachers assume great importance.

Research on attitude towards computers have been conducted in Turkey among students (Şerefhanoglu, Nakiboğlu and Gür, 2008); teachers (Erkan, 2004; Çelik and Bindak, 2005; Deniz, 2005; Ocak, 2005) and teacher candidates (Asan, 2002; Deniz and Köse, 2003; Gerçek et al., 2006).

Deniz (2005) found out the computer attitudes of primary school classroom teachers and subject teachers. The sample is consisted of 564 primary school teachers. Some of the major findings are as follows: (a) No differences were found between the attitudes of classroom teachers and subject teachers (b) Significant differences were found computer attitudes of teachers in relation to their ages. In general younger teachers have more positive computer attitudes and less computer anxiety than older teachers. (c) Significant differences were found between the computer attitudes of teachers and their service years. In general teachers who have been serving between 1-5 years have more favorable computer attitudes than the ones who serving 21 and above years; (d) No significant differences were found between computer attitudes of teachers and their computer ownership; and (e) Significant differences ($p < 0.01$) were found between computer attitudes.

Derscheid (2003) examined early childhood educator's attitudes toward and knowledge about computers in the classroom. Results indicated that early childhood educators had a neutral to positive attitude toward computers about computers in an early childhood classroom. Early childhood educators aged 18-30 had more positive attitudes toward computer use than did those aged 41-50 years. Also, educators who used computers in

their classroom had a more positive attitude toward computers than did those who did not use a computer in the classroom.

Erkan (2004) determined the attitudes towards computers of kindergarten teachers and to identified the effects of age, computer experience and have a computer on their attitudes. The sample of the study includes a total of 164 teachers. The data of the study were collected using two tools: general information form and scale of the computer attitudes. Results indicated that kindergarten teachers had positive attitude toward computers. Teachers aged 18-35 had more positive attitudes toward computer use than did those aged 36-40 years. Also, teachers who have computers in home had a more positive attitude toward computers than did those who did not have a computer in home.

Çelik and Bindak (2005) investigated the computer attitudes of primary school teachers according to various variables. For this purpose, an attitude scale to measure attitudes towards computer together with a questionnaire was applied to 261 primary school teachers. According to the results, it was determined that computer attitudes of teachers didn't change according to gender, branch, and work place. Besides, it was determined that the positive attitudes of teachers who had a computer were significantly higher than those who did not have a computer. It was also determined that there were positive and significant relations between computer self-efficacy, and the frequency of computer using with positive attitudes toward computer.

Ocak and Akdemir (2008) investigated the level and frequency of science teachers' use of computer applications as an instructional tool in the classroom. Results demonstrated that positive correlation was also found between science teachers' level of computer use and the integration of computer applications as an instructional tool. Results of this study showed that most of the Turkish science teachers participated in this study show positive attitude toward using computer applications. Internet, email, and educational software CDs found to have high percentage in teachers' use of computer applications in the classrooms. Also, the results found that male teachers expressed greater knowledge about computers than female teachers.

Ocak (2005) investigated the gender, age, and racial and ethnicity on the attitudes of mathematics teachers towards computer use. The participants of the study were mathematics teachers working in a wide range of New York public schools (n=50). The results indicated that there is a significant difference between effects of gender age and race and attitudes of mathematics teachers on the use of the computer. Teachers with high age group experience low confidence while teachers with low age group favor using the computers efficiently. Results demonstrated that mathematics teachers differed by their use of the computers, the confidence in using it, the knowledge about the computers. Implications of the study give valuable insight to the future use of the computers inside mathematics classroom, and teachers' attitudes toward the computers.

Smith (1986) examined computer attitudes of efficacy and sex-typing in relationship to sex, grade-level and teacher influence. A total of 491 students and teachers from levels 1-12 were examined. Elementary level respondents were significantly more confident than junior high or high school level. There were no significant differences between males and females in their attitudes of efficacy or sense of confidence in to use the computer, contrary to expectation. There were no significant grade levels, nor teacher/student differences between males and females with females showing stronger beliefs in equity of ability and competencies in use of the computer.

Teachers' attitudes toward computer are of the most significant (Derscheid 2003; Tsitouridou and Vryzas, 2003). If they view computers unfavorably or with suspicion, the educational use of computers will be limited. Their attitudes can be influenced and changed positively during the early periods of their teacher training. In service of teacher training should create suitable learning environment where teachers could benefit from existing computer tools. Their success will be directly related to the effectiveness of the training provided to them and their own perceptions of the value. Therefore, it is essential to understand how teachers perceive the use of computers into their daily lessons. Their perceptions are of great value to teacher educators, in-service coordinators, and educational software designers. As a result, identifying and understanding their attitudes

is very important as teacher education and training programmes can tackle these attitudes before they have a chance to become problematic.

When the related literature reviewed of teacher's attitudes toward computers and computer use profiles are examined in either a positive or negative situations was important to take necessary precautions against. As a result of teachers' attitudes toward computer users to be examined demographic characteristics and individual differences to be put forward so people will answer, examining these issues is required.

Purpose and Research Problem

The purpose of this study is to determine the profile of computer usage of teacher and the attitudes toward computers of teacher and to investigate of several variables on their attitudes.

In the same line with this aim, the following research questions were asked;

- 1- What are the demographics of the teachers for this purpose?
- 2- What is the level of computer use? Attitudes toward computer, gender, computer use experience, their institution, graduation, age, area and according to the level of computer use is changing?

METHOD

Research Design

The research is a study of survey model. This study is concerned with the determination of attitudes and demographics. One of the main reasons employing survey methodology was that it could enable the researcher to go to the field and to collect data on the question topic from a small sample of the population in a short period as Robson (1997) stated surveys are often cross-sectional studies. That is, the focus is on the make-up of the sample and the state of affairs in the population at just one point in time. Researchers suggest that it is convenient to carry out a survey study when the researcher has time and resource problems (Cohen, Manion and Morrison, 2000). The survey included a section assessing

the independent variables; gender, computer experience, area, graduate, computer ownership, age and dependent variables attitudes toward computer.

Sample

The sample consisted of total 172 teachers selected from several cities in Turkey during 2008-2009 fall semesters. A total of 172 teachers volunteered to participate in the study. 172 teachers were randomly selected from primary and high school.

Data Collection

“Computer Usage Information Form” and “Computer Attitude Scale” developed by Berberoğlu and Çalikoğlu (1992) were used as data collection instruments. In order to collect data about demographic variables of the participants and status of computer usage, it was used a computer usage information form. This form consisted of nine items. In these items teachers were asked to indicate their gender, area, age, computer usage, computer experience, frequency of computer usage, place of computer usage, computer ownership, level of using computer program.

Computer Attitudes Scale, developed by Loyd and Gressard (1984) and translated and validated by Berberoğlu and Çalikoğlu (1992), was employed to determine their attitudes toward computers. The Computer Attitudes Scale consists of 40-items divided into four-10 item subscales: computer anxiety, computer confidence, computer liking, and computer usefulness. The items presented are positively and negatively worded statements such as “computers do not scare me at all” and “working on a computer would make me nervous”. The coefficient alpha reliability for the computer anxiety, computer confidence, computer liking, computer usefulness, and total scores were .90, .89, .89, .82, and .95 respectively. Cronbach alpha coefficient for computer attitudes scale was calculated as 0.93.

Data Analysis

The data from the respondents were analyzed using SPSS (Statistical Packages for Social Sciences) version 15.0. Positive items in the computer attitudes scale survey were assigned with numerical values ranging from 1 = "Strongly disagree", to 5 = "Strongly agree". For negative statements the scoring was reversed. As appropriate for 5 point likert scale at data collection instruments, while scoring and interpreting the findings, the score intervals are respectively 40-71.9 for "very low", 72-103.9 for "low", 104-135.9 for "mid level", 136-167.9 for "high" and 168-200 for "very high".

While analyzing data, descriptive statistics such as frequency, mean and percentage, were obtained and then t-test and variance analysis were employed as statistical procedures. For paired group comparisons, independent t-test was conducted. On the other hand, for comparisons of groups for more than two, one-way ANOVA was carried out. In order to investigate which group caused the difference in the group comparison, a post hoc Tukey HSD test was employed. Computer attitudes are significant at the significant level .05 and 0.01.

RESULTS

Demographic Information

Table 1. Teachers' demographic information

Variables		f	%
Gender	Female	73	42.4
	Male	99	57.6
Age	35 ages and less	84	48.8
	35 ages above	88	51.2
Service time	9 years and less	54	31.4
	10-19 years	50	29.1
	20 years and above	68	39.5
Place of School	Primary school	92	53.5
	High school	80	46.5
Graduate Status	Undergraduate	112	65.1
	Graduate	60	34.9
Area	Pre-Primary	117	68.0
	Secondary	55	32.0

As seen in Table 1, 42.4 % of the teachers are female while the rest, 57.6% are male. Participating in the study of teachers according to age and professional experience, we examine the distribution of 84 (48.8%) "35 years and below", while 88 (51.2%) "35 years on the" as is, 68 (39.5%) "20 years and over", 50 (29.1%) "10-19 years" and 54 "less than 9 years" experience as can be seen. Teachers' graduation status, interests, and serve their institutions were examined 112 "undergraduate" and 60 "graduate" to have graduated; 117 "pre-primary teacher" and 55 as "post primary teachers" and that 92 "in primary education" , 80 "in secondary education" was his/her.

Table 2. Using computer programs concerning the percentage level values

Using Computer Programs	Using Level (%)							
	Low		Middle		Good		Very good	
	f	%	f	%	f	%	f	%
Word processing	9	5.2	52	29.9	77	44.3	34	19.5
Spreadsheet	49	28.2	61	35.1	56	32.2	6	3.4
Graphics	89	51.1	58	33.3	25	14.4	0	0
Presentation	32	18.4	94	54.0	46	26.4	0	0
Communication	37	21.3	77	44.4	58	33.3	0	0
Database	159	91.4	13	7.5	0	0	0	0
Programming	135	77.6	35	20.1	2	1.1	0	0
Create web page	140	80.5	29	16.7	3	1.7	0	0

As seen in Table 2, 94.8% of teachers a text program, 81.6% a presentation program, 78.7% sending and receiving electronic mail program, 48.9% graphics and 71.8% use the spreadsheet program to intermediate levels and is observed above. Besides, 80.5% of the teachers' web design program, and 91.4% a database program and 77.6% in the programming did not know if it is understood.

Table 3: Distribution of teachers' attitudes towards computer

	n	Minimum	Maximum	Mean	Std. Deviation
Attitudes Toward Computer Score	172	107	192	152.77	19.37

The mean value score for teachers' views about computer attitudes was found as 152.77, standard deviation as 19.37, the maximum score as 192 and the minimum score as 107. The lowest and highest attained score were 107 and 192, respectively. Based on these findings,

it could be claimed that the teachers who participate in this study have “high level” attitudes toward computer and views about computer attitudes were regarded as positive.

Table 4. Independent *t*-test analysis for computer attitudes by gender

Gender	n	Mean	SD	df	t	p
Female	73	150.10	17.82	170	1.558	.345
Male	99	154.74	20.31			

As it is seen in Table 4, the average attitudes toward computer scores of male and female teachers were 150.10 and 154.74 respectively. This means that there is no significant difference between attitude toward computer scores of male teachers and female ones [$t_{(170)} = 1.558, p > .05$].

A one-way ANOVA was performed for the perception scores of teachers' computer attitudes for the frequency of computer experience variable. Post hoc analyses were conducted by Tukey's HSD test. Results of ANOVA are presented in Table 5.

Table 5. ANOVA results according to the computer experience

Group	Computer Experience	n	Mean	SD	df	F	p	Difference
(A)	4 years and less	82	145.62	16.01	(2-169)	16.52	.000	A-B
(B)	5-9 years	56	155.21	19.11				A-C
(C)	10 years and above	34	166.02	19.72				B-C

As shown in Table 5, a significant difference was found in terms of computer experience [$F_{(2-169)} = 16.52, p < .001$]. Using the Tukey's HSD test, it was found that significant differences in terms of computer experience were between groups A-B, A-C and B-C.

Table 6. Independent *t*-test analysis for computer attitudes by area

Place of school	n	Mean	SD	df	t	p
Primary	92	162.42	15.11	170	8.263	.000
Secondary	80	141.68	17.79			

As it is seen in Table 6, the average attitudes toward computer scores of primary and high teachers were 162.42 and 141.68 respectively. This means that there is significant difference

between attitude toward computer scores of primary teachers and high ones [$t_{(170)} = 8.263$, $p < .001$].

Table 7. Independent *t*-test analysis for computer attitudes by graduate

Graduation	n	Mean	SD	df	t	p
Undergraduate	112	146.87	18.76	170	5.991	.000
Graduate	60	163.80	15.36			

As it is seen in Table 7, the average attitudes toward computer scores of undergraduate and graduate teacher were 146.87 and 163.80 respectively. This means that there is no significant difference between attitude toward computer scores of teachers' have graduate and teachers' have undergraduate [$t_{(170)} = 5.991$, $p < .001$]. Independent *t*-test results to determine whether "computer ownership" variable has effect on attitude toward computer scores tabulated in the Table 8 below.

Table 8. Independent *t*-test analysis for computer attitudes by computer ownership course

Computer Ownership	n	Mean	SD	df	t	p
Yes	123	159.56	15.99	170	8.725	.000
No	49	135.75	16.54			

As it is presented in Table 8 there were significant differences between attitude toward computer scores of the ones who own computers ($\bar{x} = 159.56$) and the ones with no computers ($\bar{x} = 135.75$) [$t_{(170)} = 8.725$, $p < .001$]. Independent *t*-test results to determine whether "age" variable has effect on attitude toward computer scores tabulated in the Table 9 below.

Table 9. Independent *t*-test analysis for computer attitudes by age

Age	n	Mean	SD	df	t	p
34 years and less	84	166.90	13.08	170	13.308	.000
35 years and above	88	139.82	14.07			

As it is seen in Table 9, the average attitudes toward computer scores of "34 years and less" and 35 years and above teacher were 139.82 and 166.90 respectively. This means that there were significant difference between attitude toward computer scores of 34 years and less teachers ($\bar{x} = 166.90$) and 35 years and above ($\bar{x} = 139.82$) ones [$t_{(170)} = 13.308$, $p < .001$].

Independent t-test results to determine whether “Area” variable has effect on attitude toward computer scores tabulated in the Table 10 below.

Table 10. Independent *t*-test analysis for computer attitudes by area

Area	n	Mean	SD	df	t	p
Pre-Primary	117	144.04	15.51	170	11.439	.000
Secondary	55	171.36	12.44			

As it is seen in Table 10, the average attitudes toward computer scores of primary teachers and secondary teachers were 144.04 and 171.36 respectively. This means that there were significant difference between attitude toward computer scores of secondary teachers ($\bar{x} = 171.36$) and primary teachers ($\bar{x} = 144.04$) [$t(170) = 11.439, p < .001$].

DISCUSSION AND CONCLUSION

Deniz (2005), in primary schools serving the area of classroom and on teachers in his study, classroom and field teachers attitudes toward computers and computer possession and does not change according to the industry, while sex, age, tenure of office and computer self-sufficient in the sight of variables vary was found that. Çelik and Bindak (2005), classroom teachers, and industry on their study of teacher attitudes toward computers and gender, industry and the role of the residential units did not vary, the computer having the frequency of use of the computer attitudes positively influences are revealed. In conclusion, the positive attitudes of teachers to computers and attitudes that scores were found to be in good level. According to teachers' computers in the classroom environment, the application will be successful when they can be said about them they trust. Sexton et al. (1999), they have the attitudes of teachers to computers, the computers in the classroom are directly related to the use and negative attitudes of teachers who prefer to use computers in educational activities were not specified.

It is seen that attitude scores about computer show a no meaningful difference in the direction of female students' teachers (Asan, 2002; Çobanoğlu, 2008; Birgin, Kutluca and Çatlıoğlu, 2008; Oosterwegel, Littleton and Light, 2004; Tılfarlıoğlu and Ünaldı, 2006; Yuen

and Ma, 2002). It is expressed that a meaningful difference is seen in some studies by sexes when the literature is studied (Ocak, 2005; Sadık, 2006). As a result of these studies attitudes toward the computer scores differed significantly according to gender was not understood.

It is also determined that attitudes toward computer depend on the frequency of computer usage. Wozney, Venkatesh and Abrami (2006) express that the strongest forerunner of teachers' using computers in the classroom teaching activities is usage of computers outside the classroom. It is seen that there is a meaningful difference between teacher candidates who receive computer courses and teacher candidates who don't receive (Dupagne and Krendl, 1992) however it is seen that it doesn't make a difference by the situation of owning a computer and computer usage age (Çobanoğlu, 2008; Gerçek et al., 2006). On the other hand, it is seen that attitudes of teacher candidates toward computer don't depend on the situation of owning a computer and computer usage age. Although Erkan (2004) and Çobanoğlu (2008) tells that there is no difference between teachers who have computers and teachers who don't have computers, Birgin, Kutluca and Çathioğlu (2008) tell that teachers who have computers have more positive attitudes toward computer than teachers' candidates who don't have computers.

However, the positive attitude that this study will increase with experience, the results can be regarded as an acceptable result. On the other hand from research about the computers built abroad by teachers teaching classes with the teacher's most important determinants of integrating computer technology is understood to be related to their education (Dupagne and Krendl, 1992).

This study of teacher candidates enrolled in the program according to their attitudes about computer-aided education vary not been identified. Physics, chemistry, biology and math program for students enrolled in computer courses they considered to be close to one another if differences can not quit as a result is acceptable. One of the other results were found for computer-assisted education teacher candidates to have their computer attitudes and computer use to the state was determined to vary by year. Positive attitudes expedite learning, student achievement and teacher raises and increased the effectiveness of the

program; negative attitudes that prevent the learning, therefore, reduce the success of students and teachers and that it reduces the effectiveness of the program can be said (Selvi, 1996). Successfully conduct computer-assisted training activities, will take on this role of the computer-assisted education teacher candidates to have more positive attitudes and perceptions of self-efficacy is possible.

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