A STUDY ON COMPUTER USAGE AND ATTITUDES TOWARD COMPUTERS
OF PROSPECTIVE PRESCHOOL TEACHERS

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ABSTRACT

The purpose of this study is to determine the status of computer usage and the attitudes toward computers of prospective preschool teachers and to investigate several variables on their attitudes. For this purpose, "Computer Usage Information Form" and "Computer Attitude Scale" were applied to 126 prospective preschool teachers. This study is conducted with survey methods. The data are analyzed through standard deviation, 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 PostHoc Tukey HSD test is employed. At the end of the study it is determined that the prospective preschool 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 course, computer ownership, level of using computer program, frequency of computer usage, computer experience and class of the scores of attitudes toward computers. On the other hand, there is no significant difference according to the gender. It is recommended that future studies focus on investigating academicians' level of usage of computer program and attitudes toward computer technologies.

Key Words: Prospective preschool teachers, computer attitudes, computer usage, computer program.

INTRODUCTION

The development of technology has changed the environments that children grow up in. Today children experience a wide range of technology from an early age. Research indicates that computers are widespread and becoming an increasingly important part of children's life (Li and Atkins, 2004). With the increased number of computer at home, children are exposed to computers from early childhood. As educators incorporate computers into the curriculum and instruction in school, early childhood educators are emphasizing the importance of appropriate use of computers in early childhood classrooms. Although the effects computers on children's education and development are still discussed, computers are increasingly used in preschool educational institutions. The National Association for Education of Young Children, the leading association and accreditation organization in the early childhood field, strongly suggests that technology should be integrated into early childhood practice physically, functionally and philosophically (NAEYC, 1996: as cited in Işıkoğlu, 2003).

Clements stated that children should start using the computer before age seven. Clements said that there is plenty of research that has indicated the benefits of computer use before the age seven (Clements, 1999: as cited in Derscheid, 2003). Ertmer, Evenbeck, Cenramo and Lehman (1994) suggest that the students who have previous successful experiences with computers can easily adapt to the societies in which computers are frequently used (Ertmer et. al., 1994). Therefore, the kids who are successful in using computers may be expected to be more successful in the societies in which computers are intensively used. Specifically, for the appropriate use of computers in preschool 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, preschool prospective teachers and teachers become an important element in the education of children 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 related to computers, and activities that involve computer use. Computer-related activities examined are either single instances of behaviour (e.g. specific software use) or classes of behaviour (e.g. attaining computer related courses) (Smith et al. 2000). Various computer attitudes scales have been developed (e.g. Smith et al. 2000) but the Computer Attitudes Scale developed by Loyd and Gressard (1984) is one of the most often applied scales with 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), like (Yıldırım, 2000; Deniz, 2007) and computer experience (Sadık, 2006; Deniz, 2007). 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 assume great importance.

Review of the Literature

Lambert, Gong and Cuper (2008) focused on the relationships among preservice teachers' background characteristics as demographic characteristics and previous computer experiences, their perceived computer ability, and attitude toward computers. The study was conducted in four sections of an introductory educational technology course with 62 preservice teachers. Preservice teachers in the present study did not differ in their general computer attitudes based on year of college, or intended level of teaching. However, gender, their self-rated levels of computer experience significantly related to their computer attitude.

Derscheid (2003) examined early childhood educator's attitudes toward computers and knowledge about computers in the classroom. Results indicated that early childhood educators had from neutral to positive attitudes toward 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.

Taghavi (2006) examined undergraduate college students' attitudes toward computers. Attention was given to the relationship between computer attitudes and age, access to a home computer and collegiate classification. Age was not found to be significantly related to computer attitudes on any of the four subscales. The findings showed that subjects with access to a home computer had higher positive attitudes toward learning and working with computers. The findings revealed that there was a small difference between students' attitudes

and their collegiate classification. Senior students significantly expressed more positive attitudes toward computers than sophomore, and junior students.

Tsitouridou and Vryzas (2003) investigate the attitudes of early childhood teachers towards computers and Information Technology. The study examined whether or not attitudes are differentiated by a series of factors, such as: years of previous service, the use of a computer at home, inservice training, and experience of teachers with computers, as well as their views about the introduction of computers into early childhood education. The subjects of the survey were 107 inservice female early childhood teachers. The results show that early childhood educators have limited access and positive attitudes to computers. Teachers' attitudes appear to be influenced significantly by computer use at home, experience with computers and inservice training.

Aral, Ayhan, Ünlü, Erdoğan and Ünal (2006) determined the attitudes of preschool and kindergarden teachers towards computers and identified the effects of several variables on their attitudes. Their results of the study showed that attitude scores of teachers were high and that of the variables tested, prior computer training has positive effects on the attitudes of the teachers. Alabay and Keskinkılıç (2006) identified the views on computer supported teaching of 186 students who are attending pre school teaching in their research. According to results of their research, they have the idea that the candidate teachers consider computers negatively in terms of the social development of the students, and they think that the computers increase the self confidence of the students. Besides, while preschool candidate teachers' opinions about computer-assisted teaching seem to be different according to their class levels, their opinions were actually different.

In the past 10 years, attitudes toward computers have been studied with different samples and instruments. A number of studies have been performed which have aimed at specifying of attitudes of both teachers (Derscheid, 2003; Tsitouridou and Vryzas, 2003; Deniz, 2005; Sadık, 2006) and prospective teachers (Sexton et al., 1999; Deniz, 2007; Akbulut, 2008; Lambert et. al., 2008). Some studies have shown that the use of computers in education has the potential of changing teachers' and prospective teachers' attitudes positively towards computers. However, studies determining and comparing how prospective preschool teachers' attitudes towards computers are limited (Sexton et al. 1999; Alabay and Keskinkılıç, 2006). For this reason, it is important to identify the factors that affect prospective preschool teachers towards computers as a means for effective development of teacher training curriculum that will prepare teachers to face the challenges in the information age.

The purpose of the study
The purpose of this study is to determine the status of computer usage of prospective preschool teachers and the attitudes of prospective preschool teacher toward computers and to investigate several variables on their attitudes**.**

Research problem
With this framework, the research problem of this study is; "What is the status of the prospective preschool teachers' attitudes towards computers?" To illuminate this issue following sub-problems were set:
1. What is the profile of the prospective preschool teachers' attitudes towards computers?
2. Is there a significant difference between the prospective preschool teachers' attitude scores towards computers and computer experience?
3. Is there a significant difference between computer attitudes and frequency of computer usage, computer ownership and taking a computer course, genders, grade and level of using computer program of prospective preschool teachers?
4. What is the level of using computer program of prospective preschool teachers in specific tasks (such as word processing, spreadsheets etc.)?

METHOD

Research Design

The research is a study of survey model. This study is concerned with the determination of attitudes and demographics. The survey included a section assessing the independent variables; gender, grade, frequency of computer usage, computer experience, computer competency, computer ownership and taking computer course.

Participants

The sample consisted of total 126 prospective preschool teachers selected from a faculty of education in Turkey.

Table 1
The Profiles of the Participants

Gender	f	%
Female	115	91.2
Male	11	8.8
Grade	f	%
1st grade	44	34.9
3rd grade	40	31.8
4th grade	42	33.3
Total	126	100

As seen in Table 1, 91.2 % of the participants are female while the rest, 8.8 % are male. In terms of grade, the distribution is that 34.9 % of the participants are at the 1st grade, 31.8 % are at 3rd grade and 33.3 % are at 4th grade. The scarce number of male pre-service teachers here stems from the fact that male students rarely prefer pre-school education departments. The 3rd and 4th year students in this study previously attended the "Basic Computer Science" course, whereas 1st year students are new in the faculty and have not taken the course yet. The 2nd year students are still taking that course. Since this paper compares the cases before and after taking the computer course, the 2nd year student teachers were not included in the study.

Data Collection

"Computer Usage Information Form" and "Computer Attitude Scale" developed by Berberoğlu and Çalıkoğlu (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 prospective teachers were asked to indicate their genders, grade, computer usage, computer experience, frequency of computer usage, place of computer usage, computer ownership, taking a computer course, level of using computer program

For more than 20 years, attitudes toward computers have been studied with different samples and instruments. The mostly used scale was developed by Loyd and Gressard (1984) for university students' computer attitudes scale were used in this study. In order to measure attitudes toward computers, Likert type attitude scales were developed, validated, and used in much of the published research. The Loyd's and Gressard's Computer Attitude Scale is the most extensively used scale with four effective dimensions: computer anxiety, computer confidence, computer liking and computer usefulness.

Computer Attitudes Scale, developed by Loyd and Gressard (1984) and translated and validated by Berberoğlu and Çalıkoğlu (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 .89.

Data Analysis

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 PostHoc Tukey HSD test was employed.

FINDINGS

The profiles of the participants in this study are illustrated in Table 2.

Table 2
The Profiles of the Participants

Computer Ownership	f	%
Yes	66	52.4
No	60	47.6
Computer Usage	f	%
Yes	125	99.2
No	1	0.8
Place of Computer Usage*	f	%
Home	74	58.7
Student dormitory	13	10.3
Faculty	11	8.7
Internet café	85	67.5
Other	6	4.8
Computer Experience	f	%
2 years and less	30	23.8
3-5 years	55	43.7
6 years and above	41	32.5
Frequency of computer usage	f	%
3 hours and less	37	29.4
3-6 hours	38	30.1
7 hours and above	51	40.5

*** This question was marked more than one**

As seen in Table 2, 52.4 % of the participants have a computer while the rest, 47.6 % do not have a computer. All of the most them (99.2%) use computer and 67.5% of the participants use in internet cafe and 58.7% at home while the rest in faculty, his/her friends' house, student dormitory.

It was found that out of the pre-service teachers, 23.8 % were cognizant of computers for two years, 43.7 % used computers for 3–5 years and 32.5 % for more than six years. When the weekly hours of computer usage were examined, it was found that among the pre-service teachers, 40.5 % use computers for over seven hours a week, 30.1 % for 3–6 hours a week and 29.4 % for less than three hours a week.

Table 3
Distribution of Prospective Preschool Teachers' Attitudes Towards Computers

	N	Minimum	Maximum	Mean	Std. Deviation
Attitudes Toward Computer Score	126	117	198	159.54	18.32

The mean value score for student prospective preschool teachers' views about computer attitudes was found as 159.54, standard deviation as 18.32, the maximum score as 198 and the minimum score as 117. The lowest and highest attained score were 117 and 198, respectively. Based on these findings, it could be claimed that the prospective preschool teachers who participate in this study have "high level" attitudes toward computers and views about computer attitudes were regarded as positive.

A one-way ANOVA was performed for the perception scores of prospective preschool teachers' computer attitudes for the frequency of computer usage and computer experience variables. PostHoc analyses were conducted by Tukey's HSD test. Results of ANOVA are presented in Table 4 and Table 5.

Table 4
ANOVA Results According to the Computer Experience

Group	Computer Experience	N	Mean	SD	df	F	p	Difference
(A)	2 years and less	30	139.70	14.74	(2-123)	16.93	.000	A-B
(B)	3-5 years	55	150.52	16.59				A-C
(C)	6 years and above	41	162.31	17.00				B-C

As shown in Table 4, a significant difference was found in terms of computer experience [$F_{(2-123)}$ = 16.93, 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 5
ANOVA Results According to the Frequency of Computer Usage

Group	Frequency of computer usage	N	Mean	SD	df	F	p	Difference
(A)	2 hours and less	37	135.54	13.98	(2-123)	42.27	.000	A-B
(B)	3-6 hours	38	151.60	14.65				A-C
(C)	7 hours and above	51	163.70	13.97				B-C

As shown in Table 5, a significant difference was found in terms of the frequency of computer usage [$F_{(2-123)}$ = 42.27, p<.001]. Using the Tukey's HSD test, it was found that significant differences in terms of frequency of computer usage were between groups A–B, A–C and B–C.

Independent t-test results that determine whether "computer ownership" and "taking a computer course" variables have effect on attitude toward computer scores tabulated in Table 6 below.

Table 6
Independent *t*-test Analysis for Computer Attitudes by Computer Ownership and Taking a Computer Course

Variable		N	Mean	SD	df	t	p
Computer Ownership	Yes	66	155.60	18.82	124	2.51	.013
	No	60	147.58	16.82			
Take a Computer Course	Yes	82	158.04	16.35	124	5.90	.000
	No	44	140.13	15.94			

As it is presented in Table 6 there were significant differences between attitudes toward computer scores of the ones who own computers ($\overline{x}$ = 155.60) and the ones with no computers ($\overline{x}$ = 147.58) [$t_{(124)}$ = 2.51, p<.05] and between attitudes toward computer scores of taking a computer course ($\overline{x}$ = 158.04) and those who do not take a computer course ($\overline{x}$ = 140.13) [$t_{(124)}$ = 5.90, p<.001].

An independent t-test was applied to determine whether there is a gender based difference on attitude toward computer scores. The results of the test are demonstrated in Table 7.

Table 7
Independent *t*-test Analysis for Computer Attitudes by Gender

Gender	N	Mean	SD	df	t	p
Female	112	159.00	18.29	124	-.948	.345
Male	14	163.92	18.66			

As it is seen in Table 7, the average attitudes toward computer scores of male and female candidates were 159.00 and 163.92 respectively. This means that there is no significant difference between attitude toward computer scores of male candidate teachers and female ones [$t_{(124)}$ = -.948, p>.05].

In order to see whether the students' attitudes towards computer varied in accordance with the grade levels, a one-way between-groups ANOVA followed by Tukey's HSD PostHoc test was used. Results of ANOVA are presented in Table 8.

Table 8
ANOVA Results According to Grade

Grade	N	Mean	SD	df	F	P	Difference
1st Grade	44	140.13	15.94	(2-123)	16.81	.000	1st Grade - 4th Grade
3rd Grade	40	154.25	18.47				1st Grade - 3rd Grade
4th Grade	42	160.88	15.07				

When Table 8 is examined, it could be seen that the scores of prospective preschool teachers' attitudes toward computer differ in terms of grade levels. Among the groups, the fourth grade participants have the highest mean value (160.88), whereas first grade participants have the lowest mean value (140.13). Furthermore, it is observed that the mean values increase as the grades rise. Tukey's HSD test showed that there was a significant grade level difference between 1st and 3rd grade in favor of 3rd grade prospective teachers in terms of year. There was also a significant difference between 1st and 4th grade one in favor of 4th grade prospective teachers in terms of year.

The frequency results that determine the levels of using computer programs of prospective preschool teachers in this study are illustrated in Table 9 below.

Table 9
Percentages of Levels of Using Computer Programs

Using Computer Programs	Percentages (%)				
	Never	Low	Medium	Medium-High	Very High
Word processing (MS Word, Wordperfect)	0	5.6	23.8	48.4	22.2
Spreadsheets (as MS Excel)	4.0	28.6	34.8	27.0	5.6
Presentation programs (as MS PowerPoint)	0	7.9	38.9	33.4	19.8
E-mail (as Hotmail, Yahoo)	4.8	2.4	21.4	34.2	36.2
Database programs (as MS Access)	82.5	13.5	3.2	0.8	0
Multimedia programs (as Mediaplayer)	4.6	11.2	25.4	30.2	28.6
Web design programs (as Frontpage, Dreamwaver)	85.7	11.1	3.2	0	0

As indicated in Table 9, regarding the level of prospective preschool teachers' use of computer programs, email (36.2%), multimedia (28.6%), word processing (%22.2) and presentation (19.8%) were scored as "very high" level of use. Other computer programs like presentation (72.3%), word processing (72.2%), spread sheets (61.8%), e-mail and multimedia (55.6%) were scored as "medium and medium high" level of use. However, web design (85.7%) and database (82.5%) programs were indicated as "never been used".

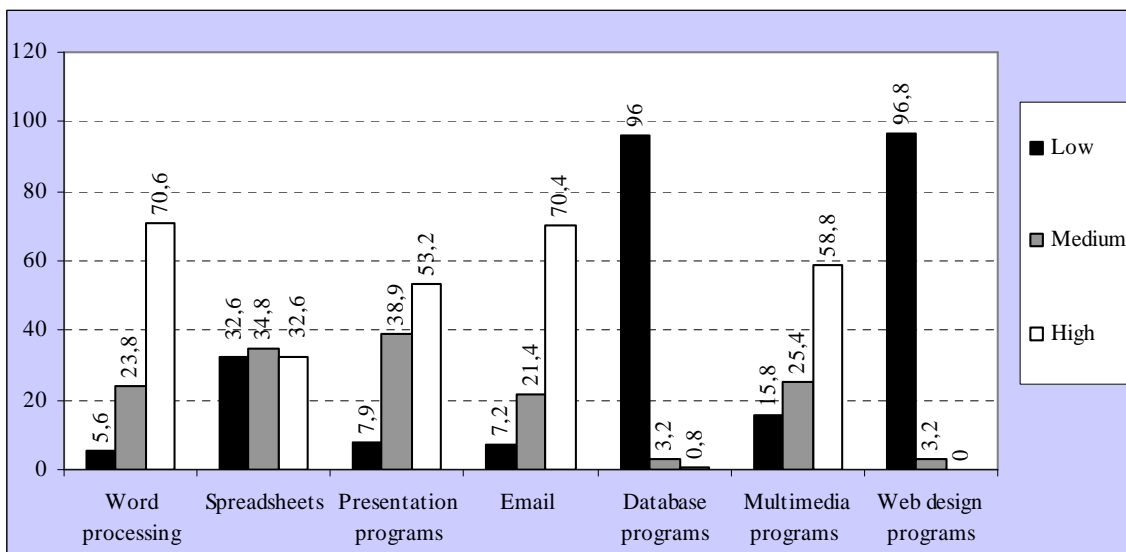Figure 1: Percentages of Values on Levels of Using Computer Programs

Figure 1 showed that prospective preschool teachers' use of computer programs, word processing (70.6%), e-mail (70.4%), multimedia (58.8%) and presentation (53.2%) were scored as "medium high and above" level of use. On the other hand prospective preschool teachers' use of computer programs, web design programs (96.8%) and data base (96%) were scored as "low and less" level of use.

A one-way ANOVA was performed for the attitude scores of prospective preschool teachers towards computer for the level of using computer program variables. PostHoc analyses were conducted by Tukey's HSD test. Results of ANOVA are presented in Table 10.

Table 10
ANOVA Results According to the Level of Using Computer Program

Level	N	Mean	SD	df	F	p	Difference
Low	36	135.00	14.25	(2-123)	56.46	.000	Low- Medium
Medium	49	151.16	11.56				Low-High
High	41	167.26	14.34				Medium-High

As shown in Table 10, a significant difference was found in terms of the frequency level of using computer program [$F_{(2-123)}$ = 56.46, p<.001]. Using the Tukey's HSD test, it was found that significant differences in terms of frequency level of using computer programs were between groups Low-Medium, Low-High and Medium-High.

DISCUSSION, RESULTS AND RECOMMENDATIONS

It was found in the study that 52.4 % of preschool pre-service teachers owned a computer and 99.2 % were regular computer users. This finding can be interpreted that computer ownership is not very effective on the computer use of pre-service teachers. When the places where pre-service teachers used computers were examined, it was found that more than half of the preschool pre-service teachers used computers at internet cafes (67.5%) and home (58.7%), and 8.7 % used computers at faculty. Similarly İşman and Çelikli (2009) showed that 64.3% of the participants have their own computer at home and Deniz (2000) reported that 8.7% of prospective class teachers use computer at school. Deniz (2007) said that 62% of prospective class teachers have computer at home; 50% of the computer owners have computers for less than three years.

The low level of computer use found in this study may be attributed to insufficiency of computer usage settings that can be used by pre-service teachers in their faculties. Thus, İmer (2003) stresses the effect of sufficient level of computer equipment in faculties of education on giving pre-service teachers the necessary computer skills. Therefore pre-service teachers should be presented with appropriate settings in their faculties where they can access computers easily.

When the computer usage experiences of the preschool pre-service teachers are examined, it was determined that 23.8 % used computers for 2 years or less, 43.7 % used computers between 3–5 years, 32.5 % used computers for more than 5 years; and when their frequency of computer usage are examined, it was found that 29.4 % used computers less than 2 hours weekly, 30.1 % used computers between 3–5 hours and 40.5 % used computers for more than 5 hours a week. Similarly some studies (Derscheid, 2003; Deniz, 2005) concluded that younger educators have more positive attitudes toward computer than older educators. The results of this study show that most of the preschool pre-service teachers knew computers and used them efficiently. From this point of view, the majority of pre-school pre-service teachers are using computers effectively, which is a promising situation.

In this study prospective preschool teachers have "high level" attitudes toward computers and their computer attitudes are quite positive Similarly some studies (Sexton et al., 1999; Derscheid, 2003; Ocak and Akdemir, 2008) concluded that participants have more positive attitudes toward computer.

In this study there are significant differences between frequency of computer usage, computer experience and attitudes toward computer by prospective class teachers. According to the results, prospective teachers who frequently used computers and computer experience had a more positive attitude toward computers than did those who did not frequently used computers and had computer experience. The results of this study are consistent with the results of prior studies (Mitra, 1998; Tsitouridou and Vryzas, 2003) implicating that there is meaningful difference between frequency of computer usage and attitudes toward computers. On the other

hand, Gerçek et al. (2006) did not find a meaningful difference between frequency of computer usage and attitudes toward computers.

Specifically, the research literature now abounds with reports demonstrating a positive relation between computer attitude and computer experience, where computer experience is defined, at least implicitly, as the amount of computer experience a person acquires over time (Ertmer et. al., 1994). Research indicates that computer experience positively correlates with computer attitude (Loyd and Gressard, 1984; McInerney et. al., 1994). The results show a remarkable consistency with the results of prior studies in related literature. Furthermore, a meaningful difference between computer experience and attitudes toward computer is found (Savenye, 1993; Khine, 2001; Tsitouridou and Vryzas, 2003; Aral et. al., 2006; Lambert et. al., 2008).

Results indicated that prospective preschool teachers had positive attitudes toward computers about taking computer course and computer ownership. Similar results were obtained in other studies that the prospective teachers who have taken computer course develop more positive attitudes towards computers when compared with the prospective teachers who have not taken a computer course (Sexton et. al., 1999; Aral et. al., 2006). While some studies (Sexton et. al., 1999; Yıldırım, 2000) have put forward statistically significant differences between taking computer course or not, some other studies (Deniz, 2000; Gerçek et al., 2006) have not revealed any statistically significant differences in favor of taking computer course and attitudes toward computers.

The results of this study is consistent with results of some prior studies (Deniz, 2000; Khine, 2001; Taghavi, 2006; Akbulut, 2008) implicating that there is meaningful difference between computer ownership and attitudes toward computer. Similarly Sexton et al. (1999) found that prospective early childhood students who had access to computers at home were more positive toward computers. On the other hand, a meaningful difference between computer ownership and attitudes toward computer is found (Deniz, 2005; Aral et al., 2006).

Research has reported significant differences in male and female attitudes toward computers. According to the computer attitudes score averages, the positive attitude scores of male pre-service teachers outperform the positive attitude scores of females, though this attitude score difference among genders was found statistically insignificant. It is determined in similar studies that attitudes toward computers do not depend on sexes (De Blassio ve Bell, 1981; Oosterwegel, Littleton and Light, 2004; Deniz, 2007; Akbulut, 2008; Bebetsos and Antoniou, 2008). These results have the qualities which support the results obtained from this study. On the other hand, a meaningful difference between the gender and attitudes toward computer is found (Ray, Sormunen and Haris, 1999; Sadık, 2006). For example, Yıldırım (2000) reported that early childhood teachers significantly differed in their attitudes toward computers on the basis of gender and years of teaching experience.

Previous research in relation to gender differences in computer related attitudes in general has shown that males have more positive attitudes towards computers than females (Dupagne and Krendi, 1992; Colley, Gale and Harris, 1994; Bebetsos and Antoniou, 2009). Other studies found that females had more positive attitudes than males (Ray, Sormunen and Haris, 1999; Rugayah, Hashim and Mustapha, 2004). In recent studies, however, results begin to show that the gender gap is becoming insignificant (Hunt and Bohlin, 1993; Deniz, 2007). A possible reason for this is the widespread use of computers among a wider cross section of the population to perform ordinary things such as shopping or making reservations for a theater show. These results have led some to conclude that there is a gender gap in attitudes toward computers.

It was found that the prospective preschool teachers' computer attitudes differed significantly in terms of grade level. The results indicate the increase of mean scores from the first grade to fourth grade and the significant difference in favor of 3rd grade ($\bar{x}$ = 154.25) and 4th grade ($\bar{x}$ = 160.88) rather than 1st grade ($\bar{x}$ =

140.13) lead a conclusion that the grade level is an important variable for the level of prospective preschool teachers' computer attitudes. This result may explained with the fact that the 3rd and 4th year students in this study previously attended the "Basic Computer Science" course and completed several tasks such as homework and projects using computers. Similarly, in a number of studies computer attitudes were found to differentiate with respect to year of study variable (Alabay and Keskinkılıç, 2006; Taghavi, 2006). Opposite results were obtained in Gerçek et al. (2006). They did not find a meaningful difference between taking computer course and attitudes toward computer.

This study found that the level of prospective preschool teachers' use of computer programs, word processing, e-mail, multimedia and presentation scores as "medium high and above" level of use. However, prospective preschool teachers' web design and data base programs were indicated as never been used. On the other hand, regarding the frequency of using computer applications, Ocak and Akdemir (2008) found the Internet (%49.2), emails (%47.6), and educational software CDs (%14.3) as applications used most frequently by the teachers. Other software programs like word processing (34.7%), spread sheets (36.5%), desktop publishing (36.5%), and presentation (30.2%) were scored as medium level of use. Similar results were obtained in another study (Ocak and Akdemir, 2008) as well. It would be facilitating to see how using the computer enables prospective teachers to use the computer programs in advanced level computer and computer assisted instruction lessons except "Basic Computer Science" course.

In this study, the computer attitude score averages of the preschool pre-service teachers with high ($\bar{x}$=167.26) or medium ($\bar{x}$=151.16) level of computer knowledge were determined to be higher than their counterparts with a low level ($\bar{x}$=135.00) of computer knowledge. Some studies reported that exposure to a variety of computer applications, word processing in particular, seemed to also have an effect on attitude change (Hunt and Bohlin, 1993; McInerney et al., 1994; Mitra, 1998). In terms of computer literacy and the use of specific applications, prospective class teachers reported that they are least competent in using web design and database while they are most competent in word processing. Differences have been found, however, in computer attitudes and their self-reported using computers. The results show that prospective preschool teachers who are more competent in using computers have also more favorable attitudes towards computers. This result shows a consistency with results of some prior studies (Deniz, 2007). Why should educators be concerned with how children are using their computers at home? Lauman (2000) said that students who have a computer at home may have the advantage of bringing skills to the learning situation that will set them apart from others who are fortunate, particularly if students with home computers have developed using the power and capabilities of the word processing, database, spreadsheet and multimedia programs as well as effective searching, analyzing and synthesizing information available on the internet.

The data used in this study were collected from prospective preschool teachers in a Faculty of Education in Turkey. It is recommended that similar studies be conducted to test undergraduate students from different teacher education programs so that results of similarity and disparity could be sought. Like other empirical studies, this study is not without its limitations: the study can be strengthened by increasing the sample size and including participants in other universities and with different variables.

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