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Effects of Computer Assisted Instruction on Preschool Students' Attitudes Towards Computer

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ABSTRACT

In our day, computers are being effectively used in almost every aspect of life. Their utilization is at an increasing rate in Pre-School Education in the recent years. Computer instructed learning is able to make great contribution to improving standards in Pre-School Education. However, the children must be interested in computer centered learning and enjoy their experience with it. Therefore, the main objective of this research is to study the effect of computer instructed learning on the students' attitude towards computer. The research is carried out within the framework of pre-test and post-test. The workgroup is composed of 60 pre-school student. The measuring tool used is Evaluation Form For Attitude Towards Computer (EFFATC). In the research, after the pre-test was done, post-test has been applied to students who were given Computer instructed education along 10 weeks. After all, it was evident that computer assisted instruction had positive impact on childrens' attitudes towards computer.

Keywords: Preschool education, Computer Assisted Instruction, Students' Attitudes
The type of research: Research

Bilgisayar Destekli Öğretimin Okul Öncesi Öğrencilerinin Bilgisayara Yönelik Tutumlarına Etkisi

ÖZET

Günümüzde bilgisayarlar hayatın her alanında etkin olarak kullanılmaktadır. Okul öncesi eğitimde de kullanım oranı son yıllarda giderek artmaya başlamıştır. Bilgisayarla desteklenen öğretim, okul öncesi eğitimde niteliğin artırılmasına önemli ölçüde katkı sağlayabilir konumdadır. Bununla birlikte bu katkının tam olarak sağlanabilmesi için çocukların bilgisayarın merkeze alındığı öğrenim sürecine ilgi duymaları, bilgisayarla yapılan etkinliklerden hoşlanmaları, zevk almaları temel koşul niteliği taşımaktadır. Bu yüzden bu araştırmanın amacı, bilgisayar destekli öğretimin okul öncesi çocuklarının bilgisayara yönelik tutumlarına etkisini incelemek olarak belirlenmiştir. Araştırma ön test–son test kontrol gruplu deneme modeli çerçevesinde yürütülmüştür. Araştırmanın çalışma grubunu 60 okul öncesi öğrencisi oluşturmaktadır. Araştırmada ölçme aracı olarak Bilgisayara Karşı Tutumu Ölçmeye Yönelik Gözlem Formu (BKTÖYGF) kullanılmıştır. Araştırma sürecinde ön testlerin ardından deney grubunu oluşturan çocuklara 10 haftalık bilgisayar destekli öğretim verilmiş ve son testler uygulanmıştır. Elde edilen bulgular göre bilgisayar destekli öğretim, çocuğun bilgisayara yönelik tutumunu olumlu yönde etkilediği yönündedir.

Anahtar Kelimeler: Okul Öncesi Eğitim, Bilgisayar Destekli Öğretim, Öğrenci Tutumları
Çalışmanın Türü: Araştırma

1. INTRODUCTION

Pre-school education is a very important stage in a child's development. At this stage, child goes through a rapid development in terms of physical, emotional, social, mental/cognitive and psychical behaviour. A reasonable approach that helps the child at this stage will have a positive impact on his future life. Providing rich stimulants to the education environment allows better quality education. In this process, computer is seen as an increasingly important educational tool in pre-school education (Edwards, 2005) and is being helpful in various pre-school education programmes (Chen & Chang, 2006). Children who become part of educational activities demonstrate higher educational level and can thoroughly understand the concepts which makes them more willing to overcome complex questions (Roschelle et al., 2000; 81).

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Effective use of Computer in education gave birth to the concept of Computer-assisted Instruction (CAI). Computer-assisted instruction is defined as the students interacting computers in their educational process and making use of computers as an educational tool (Erişen & Çeliköz, 2011). In pre-school education CAI alone can not match traditional learning (Peng, Wah & Ishak, 2009; 1493) and is more helpful when combined with traditional learning (Vernadakis et al., 2005; 99).

Computer allows children to enjoy their learning experience however, main questions in its use and age of initiation of computer must be considered. According to some educationists, children must meet computer in pre-school time since it is a stage in which children are very much interested in discovering things around them (Yaşar, 2002). However, children who spend long hours with computer may become no more willing to spend time with traditional playing tools (Yelland, 2005; 203). Thus causing physical and social problems in his development. Children spending long hours with computer as well as activites not appropriate and without adult supervision may lead to undesired consequences (Kol, 2012; 888). Oktay, (2007) it seems not possible to determine an initiation age for children; it is an inevitable fact that children are facing computers more and more in their living environment and being attracted more.

Use of computers in pre-school education is essential since it provides learning environment appropriate to their learning speed and needs. The researches show that the children who started using computers when they are 3-4 years old demonstrate better development than the children in similar classes who never used computer (Ataizi, 2002). Thanks to the motivation and opportunities brought in by computer, it has a great importance in childrens' language learning development. For example; The children can make more complex and longer phrases with the help of appropriate software (Akkoyunlu & Tuğrul, 2002). It also adds to childrens' individual learning skills and concept development (Roschelle et al., 2000; 82).

It is important to choose the appropriate programmes having appropriate language and visual quality in order to maintain the education and reach its goals by allowing the children to interact with computer. Using appropriate software in pre-school activities helps reaching the goals and enhances them. It also helps the children to improve their skills in terms of independent thinking, taking responsibilities and ability to work together (Anderson, 2000). The researches show that, when the appropriate software is used, it adds to the childrens' cognitive, social and motor development (Nikolopoulou, 2007). As pre-school education is identified with game-based education (Edwards, 2005) the Computer-instructed education software are mostly play-based. As the children enjoys playing games on the computer, they also interact with CAI and are given the intended education and basic computer skills.

The childrens' attitudes is very important in terms of their computer skills development. The individuals daily simple thoughts, his likes and dislikes are indicators of his attitude (Hannula, 202; 25). Attitude is defined as the tendecy that organizes his possible behaviours, thoughts and emotions related to a psychological object (Aydın, 2004; 281). It is obvious that the children who obtained basic computer skills in pre-school age and who demonstrated good attitude towards computer will be more successful throughout their life since they have continous interaction with computer. The researches show that the more experience they have the more positive attitute they demonstrate (Potosky & Bobko, 2001; 391).

The objective of this research is to study the effect of Computer-assisted instruction on pre-school students' attitudes towards computer. Below are given the hypothesis.

a. Is there a significant difference between control group of students in terms of attitude towards computer?
b. Is there a significant difference between students in the experimental group in terms of attitude towards computer?
c. Is there a significant difference between both students in the experimental group and control group in terms of attitude towards computer?

2. MATERIAL AND METHODS

2.1. Research model

In this research pre-test, post-test control group experimental model was used. In pre-test, post-test control group model, there are two groups whose elements are randomly assigned. One group is used as

experimental group and the other as control (Karasar, 2009). Pre-test, post-test pattern is a widely used mixed control group pattern. Participants, before experimental process, are göne through independent variable measurement. If the pre-test datas of experimental control groups are similar before experimental process and the post-test results are different from each other after experimental process it means that the experimental process affected the independent variable (Büyüköztürk, 2007).

2.2. Working group

The working group is composed of 60 pre-school students who were studying in Adapazarı İsmet İnönü Primary School in 2011-2012 academic year. These 60 students were selected using cluster sampling method. Working group genearally consists of clusters with similar purposes made up of various elements. The research can be made over the sets chosen from universe. Sampling in which each single set can be selected as equal is called cluster sampling (Karasar, 2009). The experimental control groups are selected using random method. The distribution of experimental and control group students by gender is shown on Table 1.

Table 1. Distribution by gender of control and experimental group students

Gender	**Experimental Group**		**Control group**	
	n	%	*n*	%
Male	23	77	20	67
Female	7	23	10	33
Total	**30**	**100**	**30**	**100**

The working group of the research is composed of 30 experimental and 30 control group students which adds up to a total of 60 students. The students who make up the working group are 60-72 months old children. There are 23 male and 7 female students in the experimental group while 20 male and 10 female in the control group. The research after pre-tests showed that the experimental and control groups are similar and they demonstrated no significant difference in attitude towards computer. Table 2 shows the comparison of pre-test attitude scores between experimental and control group students.

Table 2. Comparison of Attitudes of Experimental-Control Group Students According to Pre-test results

Groups	*N*	$\bar{x}$	*S*	*sd*	*t*	*p*
Experimental	30	26,43	3,47	58	,878	,384
Control	30	25,66	3,29			

p<0.05

According to the pre-test results of experimental and control group students, no significative difference has been found in their attitudes towards computer (t=,878, p>,05). This shows that the children demonstrate homogenous, or in the other words similar characteristics in terms of attitude towards computer. Thus, differences that could come along the research process can be connected to the experimental process.

2.3. Tools used for collecting data

In our research, Evaluation Form For Attitude Towards Computer (EFFATC) was developed by the second researcher under the supervision of the first researcher and was used as tool for collecting data. In the process of the development of the Evaluation form, a question pool was made at the outset in order to determine the students attitude in the affective level towards computer. Later the scale was studied by 5 Primary school teachers and 7 specialists with doctor's degree in the related field in terms of content validity and adequacy of the form of expression. Taking into account their opinions and suggestions, some items were modified while some of them were removed from the scale.

Scale is finally graded as "I totally agree", "I agree", "I am undecided", "I don't agree", "I totally don't agree". The positive answers start with "I totally agree" and scored from 5 to 1. The negative answers start with "I totally don't agree" and are scored from 1 to 5. The EFFATC made to observe students attitudes towards computer consists of 10 questions.

2.4. Collecting datas

The process of collecting datas took 15 weeks within the 2011-2012 academic year. This process consists of application of pre-test, providing computer assisted instruction to the experimental group and the application of post-test.

Within the period of application of pre-test, the teachers applied Evaluation Form for Attitude towards Computer (EFFATC) to their students and tried to find out their attitudes towards computer. In both experimental and control group classes one computer for each class is disponible and the teachers use computers with limited availability. The teachers completed the EFFATC form during the related activities or by application of different activities from which intended observations could have been obtained and also by observing the students attitude towards computer. Total time for collecting data was 3 weeks. The process of collecting data was carried out by primary school teachers under the supervision of researchers.

2.5. Analysis of the data

SPSS 17 (Statistical Package for the Social Sciences) statistics software was used to analyse the datas. Firstly, arithmetic mean, standard deviation calculations were realized. After these calculations, by use of Kolmogorov-Smirnov (K-S) test it has been studied if the datas showed normal distribution. After it has been found out that the groups showed normal distribution, the groups were compared by using dependent and independent t-test and the results were interpreted based on 0,05 level of significance.

3. RESULTS

Firstly, the attitude achievements of the children were studied in order to find out if there is any change in their attitude towards computer. The t-test results showing comparison of attitude achievements are given in Table 3.

Table 3. Independent t-Test Results Showing Attitude achievements of Control Group Students

Control Group	*N*	$\bar{x}$	*S*	*sd*	*t*	*p*
Pre-test	30	25,66	3,29	29	6,115	,000
Post-test	30	28,00	2,10			

p<0.05

A significant change in attitude achievement (pre-test, post-test) scores of control group students can be seen on Table 3 (t=6,115, p<,05). The average score $\bar{X}$=25,66 of control group students in the beginning of the education period, rised to $\bar{X}$=28,00 after traditional education applications partially including computer applications. Thus, we can conclude that the educational process in which traditional education is dominant but partially includes computer applications had positive impact on the students' attitudes towards computer.

Our second study was to understand attitudes of the experimental group students towards computer. Fort this purpose, the t-test was realized as dependent on difference between pre-test, post-test results. Table 4 shows the comparison results of students' attitudes achievements.

Table 4. Independent t-Test Results Showing Attitude achievements of Experimental Group Students

Experimental Group	*N*	$\bar{x}$	*S*	*sd*	*t*	*p*
Pre-test	30	26,43	3,47	29	33,174	,000
Post-test	30	49,06	1,22			

p<0.05

When we look at the t-test results in Table 4, a significant change in attitude achievement (pre-test, post-test) scores of experimental group students can be seen (t=33,174, p<,05). The score $\bar{X}$=26,43 of experimental group students before Computer-assisted education, rised to $\bar{X}$=49,06 after they were given Computer-assisted education. The increase rate is significant. We can say that Computer-assisted education applications have increased the childrens' interest in computer; they liked the applications and enjoyed learning through computer.

In order to compare between experimental and control group students' attitudes towards computer, after 10 weeks of education, final test and t-test was realized. T-test was realized in order to compare the test scores of both groups. The results are given in Table 5.

Table 5. Independent t-Test Results Showing Attitude achievements of Control-Experimental Group Students

Groups	*N*	$\bar{x}$	*S*	*sd*	*t*	*p*
Experimental	30	49,06	1,22	58	47,398	,000
Control	30	28,00	2,10			

p<0.05

When we look at the Table 5, a significant difference in attitude achievement scores between experimental group students and control students can be seen (t=47,398, p<,05). The score of experimental group students given Computer-assisted Instruction ($\bar{X}$=49,06), is higher than the score of control group students ($\bar{X}$=28,00) from which we can conclude that they gained better attitude towards computer. In other words, the educational process in which Computer-assisted applications are dominant seems to have a better impact on childrens attitude than the traditional process in which computers are rarely used.

4. DISCUSSION AND REVIEW

In the research process, the attitudes of the students who make up the control group have been observed and the pre-test, post-test studies have been realized.

In the research, it was found out that there was no significant difference between control and experimental group students in terms of their attitude towards computer. Once the datas collected by pre-test were analysed, no significant difference in Evaluation Form for Attitude towards Computer (EFFATC) results have been found. This result could be interpreted as the attitudes of control and experimental group students were similar and good for research.

As the first step of our research, it was checked if there is significant difference between the control group students' pre-test, post-test results. Our research showed that there is significant difference in students attitudes who were not given Computer-assisted education but only given traditional education. The reason for this can be that the students can use computer in their classes -though with very limited availability- and also have high possibility of interaction with computers at home or in other social areas. The children being part of any kind of process related with computers raise their interest in computers at affective level thus making him open-minded, able to realize what he wants to do and grow positive attitude towards such a device that runs every kind of game with animation and music.

Our second goal was to find out if there was any significant difference in attitudes of experimental group students. It is expected that the experimental group students who participated the research have better attitude towards computer after Computer-assisted education. The experimental group students, after 10 weeks of Computer-assisted education seemed to have better computer skills and realized that computer can respond to their needs.

In CAI process, the children who make up the experimental group were given CAI in total of 10 hours in 2 sessions each of 30 minutes. The children were firstly instructed by software that teached them basic computer skills. As the second step, CAI games were introduced so that they could use hand-eye coordination by use of Mouse. The CAI software used was made in compliance with curriculum of Ministry of Education. Familiar images and animations were prefered. The software can ask questions orally and asks for a response. If the answer is correct, the student is directed to the next stage. If wrong, it asks the question again. 10 games including 9-12 stages were used. The students participated the whole experimental process and the ones who couldn't participate at time attended catch-up education. By the nature of the process, after interaction with computers, positive impact on the students' attitudes towards computer was observed.

From test results, it has been found out that experimental and control group students demonstrated no significant difference in terms of their attitude towards computer. It is expected that better performance of the students who make up the control group depend on the time they are going to spend after the CAI.

The students who were shy against computer technology and lacking basic computer skills changed their attitude to positive after their interaction with computer. The attitudes of control group students also showed improvement. The reason for this can be that the students can interact with computers in traditional preschool activities -though very limited- and also have high possibility of interaction with computers at home or in other social areas.

CAI, as different from traditional education, allows learning activity to be entertaining thus making the children more willing to join the activity. At the same time, the ease provided by computer in concretizing their knowledge, making it better understood by colors, shapes, objects, animations or videos thus making information meaningful and lasting are other advantages of CAI over traditional education.

The researcher scanned the literature and found no qualified work studying the pre-school students attitude towards computer. When we look at attitudes of students of different age group; Altun et al. (2011), Kubiatko et al. (2011), Saçkes et al. (2011), Kutluca & Ekici (2010), Duru et al. (2010), Tekindal et al. (2010), Birgin et al. (2008), Donnell (2008), Akbulut (2008), Akçay et al. (2008), Köse et al. (2007), Ateş et al. (2006), Teo (2006), Kacar (2006), Sexton et al. (1999), Leite (1994), Hunt & Bohlin (1991) found out that students demonstrated positive attitude towards computer.

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