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## Effects of Multimedia Videos Designed for Computer Package Software Training on Learning

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### Abstract

Use of videos as multimedia materials in class and integration of these materials into education increase the quality of education. This study was conducted with 219 students attending the departments of Elementary School Teaching and Pre-School Teaching at Education Faculty in the academic year of 2011-2012. In order to determine their level of background knowledge, the students were given an achievement pre-test regarding educational subjects. The test questions prepared by the Ministry of Education and private courses given by companies like European Computer Driving License (ECDL) and Microsoft were used to determine the students' levels of knowledge about the package software regarding which training would be given. The results of the study revealed that the courses given using multimedia videos were more successful than those given based on traditional methods.

Keywords: Internet, educational videos, multimedia, package software;

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## **1. Introduction**

Developments in information and computer technologies along with revolutionary innovations in the process of learning took education beyond classrooms and made it accessible from any place (Yalman, 2013). Technology can be defined as the implementation of scientific principles and innovations on problem solving tasks and considered to facilitate people's lives. Besides, it changes interdisciplinary relationships and information areas and has influence on the increasing amount of information (Williams & Kingham, 2003; Erdemir et al., 2009). Along with these changes, thanks to technology, the teacher, rather than merely transferring the information, becomes a facilitator and a guide for students who are willing to learn; the teacher himself or herself becomes a learner; and students move from their traditional position as a student who just receives the information to an active position as a researcher who solves problems (Norton, 1998; Altinisik et.al., 2002).

Multimedia can not only be defined as "materials presented with the use of words and images" or as "files for integrated and interactive application and presentation prepared in various digital environments such as texts, audios and videos used to send a certain message or information to other people" but also be defined as integration of two or more types of information (text, picture, animation, audio, video etc.) within the same application (Mayer, 2001; Neo & Neo, 2004; Davies & Riley, 2008).

Mayer (2001) defined the Derivational Multimedia Learning Hypothesis as the presentation of a material in various ways supported with visuals and texts. In line with this definition, audio visual materials designed with the use of computer software, PowerPoint presentations and movies shown on TV could be given as examples of multimedia (Akkoyunlu & Yilmaz, 2005; Yalman & Kutluca, 2013). It is believed that using multimedia tools as supplementary training materials may have positive effects on students' success (Hopper, 1998; Beacham, 2005). Students can increase their success by reviewing the contents of supplementary teaching materials (course books, workbooks, handouts and so on) outside the classroom. Multimedia can be used in three different ways; namely, as a supplementary material, as a self-study material and as practice and testing materials which could be used by both teachers and students.

Although it was proved by experimental studies that using videos in teaching is effective, it still is not implemented prevalently. The supplementary teaching materials prepared in the past had the opportunity to be improved with the help of studies carried out by knowledgeable scholars. The purpose of this study, to some extent, was to present concrete data regarding the effectiveness of using technology at universities.

## **2. Method**

In this experimental study, a pre-test-post-test model with a semi-experimental control group was used (Erden, 1993). Furthermore, qualitative data were collected and analyzed in the study. The course contents were prepared in accordance with the curriculum designed for universities by the Higher Education Council. The multimedia videos used as the course materials were prepared and checked by faculty members from the field of educational sciences, and the appropriateness of the materials to the learning outcomes was checked by field experts. The multimedia videos were prepared on weekly basis after each training session and uploaded to the education website designed, and the students were trained on how to make use of these resources.

### **2.1. Universe and the Research Sample**

The research universe included students attending the departments of Elementary School Teaching, Pre-School Teaching and Social Sciences Teaching at Education Faculty. The experimental group was made up of 104 male and 115 female participants. There were two classes in each of the departments

involved in the study. While determining the control group, special attention was paid to the fact that each group to be compared in the study included equal number of students. There were 204 students in the control group.

## **2.2. Subjects**

The subjects were freshmen (n=219) attending the departments of Primary School Teaching and Pre-school Teaching at the Education Faculty in the academic year of 2011-2012.

## **2.3. Measurement Tools**

The tests conducted to determine the background knowledge levels of the students regarding computer package software training were designed and prepared by the Ministry of Education and by private computer courses organized by such companies as European Computer Driving License (ECDL) and Microsoft. The features of these tests can be seen below. The Alpha value of the tests used in this study was found out to be 0,845.

## **2.4. Achievement Test**

Several tests were designed for the purpose of determining the knowledge levels of the students regarding the course of "Introduction to Computer." For validity and reliability issues;

➤ A chart table indicating the objectives and the desired outcomes in accordance with the curriculum was prepared.

➤ 300 questions were prepared in line with the curricula of computer courses designed by the Ministry of Education Public Education Centers, European Computer Driving License (ECDL) and Microsoft.

➤ 300 questions were evaluated by experts from the field of Educational Sciences Measurement and Program Development, and the appropriateness of these questions to curriculum was evaluated by the faculty members of the department of Computer Education and Instructional Technologies.

➤ Accordingly, 100 questions were eliminated, and the remaining 200 questions were equally divided into two: one half was used in the pretest and the other half in the posttest.

The questions chosen were used to determine the achievement levels of the pre-service teachers regarding the use of package software to be taught in the course of "Introduction to Computer".

## **2.5. Experimental Process**

In the study, lesson videos related to the Microsoft package software found in the curriculum were prepared for the pre-service teachers. In the trainings given with the multimedia videos, the process described below was followed:

- 1- An application directive for teaching was prepared,
- 2- Course materials were developed,
- 3- Educational videos prepared by various companies were analyzed and the proper ones were chosen
- 4- Educational curriculum-based videos to be used during teaching were prepared with Camtasia Studio.

### 3. Finding

In order to find out the effectiveness of the multimedia videos on learning which were used for the computer package software training based on the curriculum of basic computer courses given to freshman students at Education Faculty, the mean scores and standard deviations obtained via the pre-test and post-test conducted were determined. The findings are presented in Table 1 below.

**Table 1. Mean scores and standard deviations in the pre-test and post-test for the experimental group of pre-service teachers.**

	N	Mean	Ss
Pre-test	219	36,97	20,91
Post-tests		65,26	14,20

The achievement mean scores of the pre-service teachers participating in the study were calculated as 36,97 in the pre-test and as 65,27 in the post-test. Approximately 90% difference was found between pre-test and post-test mean scores of the students.

**Table 2. The distribution of the pre-service teachers with respect to gender, their pre-test and post-test mean scores and the related standard deviations**

Group	N	Pre-test Mean Score		Post-test Mean Score		Difference Mean Score
		Mean	S	Mean	S	SH
Female	115	33,33	20,96	63,90	14,34	30,57
Male	104	41,00	20,20	66,77	13,96	25,77

The experimental group was made up of 115 female and 104 male students. The mean scores in the achievement pre-test were  $\bar{X} = 33,33$  for the female students and  $\bar{X} = 41,00$  for the male students. Likewise, the mean scores in the post-test were  $\bar{X} = 63,90$  for the female students and  $\bar{X} = 66,77$  for the male students. The difference between the mean scores in the pre-test and posttest was 30,57 for the female students and 25,77 for the male students. In order to find out whether the difference was statistically significant or not, Paired-Sample t-test was applied.

**Table 3. Paired-Sample t-test results for the pre-test and post-test mean scores of the female students.**

Measurement	N	Mean	Ss	Sd	t	p
Pre-test	115	33,33	20,96			
Post-test	115	63,90	14,34	114	-17,396	.000

The mean score of the female students in the achievement pre-test was ( $Ave_{pre-test} = 33,33$ ,  $Ss=20,96$ ), while it was ( $Ave_{post-test} = 63,90$ ,  $Ss=14,34$ ) in the achievement post-test. The difference between the pre-test and post-test mean scores was found to be significant ( $t_{(115)} = -17,396$   $p > .05$ ). It could be stated that the significant difference revealed was in favor of the achievement post-test and that the multimedia videos had positive influence on the achievement levels of the female students.

**Table 4. Paired-Sample t-test results for the pre-test and post-test mean scores of the male students.**

Measurement	N	Mean	Ss	Sd	t	p
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Pre-test	104	41,00	20,20	103	-17,525	.000
Post-test	104	66,77	13,96			

The mean score of male students in the achievement pre-test was ( $Ave_{pre-test}=41,00$ ,  $Ss=20,20$ ), while it was ( $Ave_{post-test}=66,77$ ,  $Ss=13,96$ ) in the achievement post-test. The difference between the pre-test and post-test mean scores was found to be significant ( $t_{(104)}= -17,525$   $p>.05$ ). Similarly, it was seen that the significant difference revealed was in favor of the achievement post-test and that the multimedia videos used had positive influence on the achievement levels of the male students.

**Table 5. Pre-test and post-test achievement mean scores of the experimental and control groups**

Groups	n	Pre-test Mean Score		Post-tests Mean Score	
		Mean	S	Mean	S
Experimental Group	170	33,20	20,75	64,48	14,50
	49	39,65	21,46	67,98	12,89
	219	36,97	20,91	65,26	14,20
Control Group	53	29,38	16,13	50,83	9,89
Classical Learning Group	51	31,76	17,39	57,61	10,47

The experimental group included 219 students. The meanscores of the students from the department of Elementary School Teaching were ( $Ave_{post-test}=36,43$ ,  $Ss=21,10$ ) for the achievement pre-test and ( $Ave_{post-test}=66,23$ ,  $Ss=13,69$ ) for the achievement post-test. The control group was made up of 204 students. The mean scores of the students in the control group were ( $Ave_{post-test}=29,38$ ,  $Ss=16,13$ ) for the achievement pre-test and ( $Ave_{post-test}=50,83$ ,  $Ss=9,89$ ) for the achievement post-test. In order to determine whether there was a statistically significant difference between the pre-test and post-test achievement scores, ANCOVA was conducted.

Regarding the use of multimedia videos in teaching the computer package programs to the students within the scope of the courses of Computer-i and Computer-ii at Education Faculty, it could be stated that there was a significant difference between the achievement scores of the experimental and control groups in favor of the students who were taught via instructional multimedia videos.

**Table 6. ANCOVA Results Regarding the Corrected Post-test Scores Compared to Pre-test**

Source of variance	Sum of Squares	Sd	Mean Square	F	p
Pre-test	3373,151	1	3373,151	37,279	.000
Method	5562,625	2	2781,312	30,738	.000
Error	13482,007	149	90,483		
Total	531551,000	153			

The influence of multimedia videos used in package software training in computer courses were found to be significant at the level of ( $F_{(2-149)}=37,279$   $p<.05$ ). Likewise, it was seen that there was a significant difference of ( $F_{(2-149)}=30,738$   $p<.05$ ) regarding the experimental method applied in the training sessions. This significant difference could be said to be in favor of those who received training with multimedia videos.

#### 4. Discussion and Conclusion

In this study, the purpose was to determine the effectiveness of multimedia videos used in computer package software training on the achievement levels of students from the departments of Pre-school Teaching and Elementary School Teaching at the Education Faculty. Of all the pre-service teachers, 16,44% of them received a score of 61 and higher (Chart 1). In addition, 34,7% of them who

continued their training with the use of multimedia videos based on the curriculum received scores below 61 in the posttest, while 65, 3% of them made a progress and received scores higher than 61 (Chart 2). Studies conducted in related literature demonstrate that teaching with multiple learning environments lead to more permanent and rapid learning (Raupers, 2000; Shepherdson, 2001; Sezgin, 2002; Tsou, Wang, Tzeng, 2004; Akkoyunlu & Yilmaz, 2005). It was found out that the method of supplementing lessons with multimedia materials is more effective than other teaching methods and techniques (application-aided instruction and traditional method of instruction). The students attending the departments of Pre-school Teaching and Elementary School Teaching, who were assigned as the experimental group, had an achievement posttest mean score of  $\bar{X}=65,26$ , while it was  $\bar{X}=50,83$  for the control group and  $\bar{X}=57,61$  for the group taught with the traditional method of instruction.

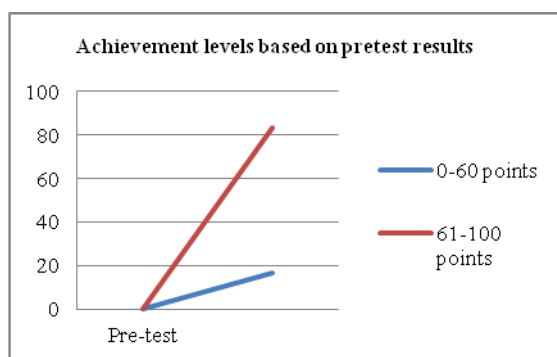


Chart 1. Achievement levels based on pre-test results

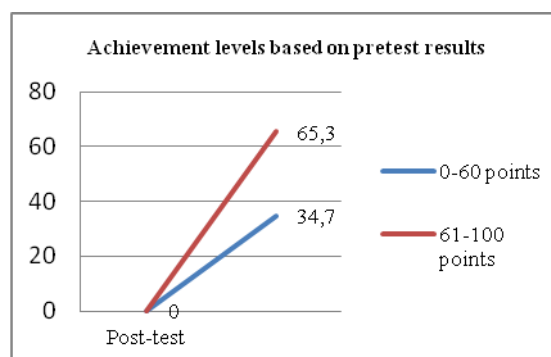


Chart 2. Achievement levels based on post-test results

According to the results of the questionnaire administered to investigate the students' preferences in choosing multimedia videos, 95,89% of the participants preferred videos prepared by their course teachers. Choosing proper course materials facilitates learning and helps make learning permanent. Since courses taught at universities depend heavily on technology, it will help preservice teachers become more qualified in using technology (Collier et. al., 1971; Alkan et. al., 1995; Fisher, 2000; Erdemir et. al., 2009).

In the present study, 87, 21% of the students believed that watching course-related videos throughout an academic year helped them increase their achievement levels. However, 52,05% of the participants stated that these videos might not be sufficient enough alone. Of all the participants, 92,24% of them reported that repeatedly watching the videos uploaded on the webpage designed is beneficial to understand the course subjects. Widespread learning environments facilitate the learning process of students and are likely to affect their approach to use of technology. In these kinds of educational environments, teachers play the most important role. However, a number of studies demonstrate that some academicians and teachers are not well-prepared for the integration of technology into the education system and that they regard this integration as a waste of time (National Science Board, 2002; Christanse, 2002; Arslan, 2006; Erdemir et al, 2009). Teachers and academicians who do not have sufficient knowledge about use of technology might be given proper training to overcome this problem.

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