

Effects of Multimedia Education on Learning Level of Long-Distance Education Students

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Abstract—The goal of the present research is to study the importance of multi-media used in education, particularly in long distance education. Therefore, two groups of students were compared, as one of them received education via multi-media software and the second received traditional education by lecture. For that purpose, a group consisting 40 students in third grade of junior high school in long-distance education system were taught experimental science course. The subjects were divided into two groups, 20 students each. The methods used in this research are semi-experimental with pre and post tests. The results of research showed that learning degree of students that received education via multi-media way was significantly different from those who received traditional education.

Keywords: Long-distance education, multi-media, learning

INTRODUCTION

In present era with respect to increasing expansion of science and need to access to scientific information in minimum possible time, attention to communication and the need for modern education system is felt more than any other times. Education is one of the areas that have been receiving greatest influence from “revolution of knowledge” that has been governing the whole world in recent years, particularly the last decades. This issue has brought up the necessity of some modern techniques and methods such as computer and using technology in educational courses in a way that would facilitate learning process and enable achieving the most effective learning goals with least efforts [1].

Role and importance of educational technology in realizing the needs of learning is giving meaning to the emotional, social, mental and physical growth of highly sensitive children and with respect to the progress and expansion of educational technologies in recent decades, new horizons have been opened before planners and educational specialists and educational managers have replaced traditional methods of teaching with modern educational methods by using those facilities [2].

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By advancement of modern technologies, computer application in education, particularly in long-distance education has been increased and the educational contents are usually developed in multi-media. In Burn’s view, the

term “multimedia” refers to collecting different types of audio-visual technologies that aim at establishing communication. Different types of multimedia include text, sound, graphic and animation. Hank Malinda and Russell believe that multimedia is a combination of several Medias such as text, graphic, sound, fixed pictures video and animation that are shown in computer. Mayer [3] in a research titled “Multi-media Learning” explains using similar educational methods in various media. The results of designing educational multimedia in Santa Barbara university lab showed that students in both textbook-based environments: 1. Students learn better when words are with pictures than words alone (multimedia effect), 2. Omitting additional and unnecessary subjects leads to better learning (integrity effect), 3. Students learn better when words are close to pictures (local adjacency effect), 4. Learning becomes deeper when words are in daily dialogue forms (principle of personalization). In computer-based environments, words were presented in dialogue forms and in textbook-based environments; words were presented in written dialogue forms. The results showed that the four methods of education plans are effective in the both books-media and multi-media tools.

Changes of educational approaches into information and technology and need to transform from traditional education system to active personalized learning has provided a suitable condition for realizing the macro goals of education in today conditions. Long distance education as a communicating factor provides learning opportunities for every person in any time and using educational multi-media leads to establishing effective communication between teacher and learner and prevents communication barriers such as lack of attention and daydreaming by the audience. This media causes deep learning.

Multi-media plans are usually similar to computer games and for this reason, students show great enthusiasm towards them [4]. In a research by Barati [5] it has been

explained that using modern technology in learning environments helps tutors to perceive their difficult situation. In this regards, role of educational multimedia includes a large range of activities; however, special attention should be made for their production.

Since multimedia education contents are used for long-distance education in form of text, picture, animation and graphic and involves few senses at the same time, the multimedia has provided the learner with the opportunity of mixing sound and picture with self-control to use the contents as per his needs. The educational specialists have found the chance of involving students in learning with explicitly as one of the highly interesting advantages of multimedia.

In a research by Shah Jafari [6], it has been said that educational multi-media could create a flexible and interactive learning environment for learners by benefitting from learning psychology principles or on the contrary, present the very traditional education in a new form.

Multimedia absorbs learners' attention and interests and makes learning faster, more effective and durable. The actual, real world and objective experiences are put in access of learners and they find themselves in situations that could not be received in any other means [7].

Bayractor [8] in his research which was a post-analysis on impacts of computer aided education in science teaching found out that computer aid education had a generally positive impact on progress of students in teaching high school and university sciences compared to traditional education form.

In a research by Karami [9], the impacts of multimedia in learning level of students in fifth grade of an elementary school for girls were tested. The subjects were 56 students in test group and 39 students in control group. After studying the post-test results, the two groups showed significantly different scores in tests; therefore, with respect to the significance of the post-test result, it was concluded that there was significant differences between scores of test group and the control group.

The growing process of multimedia in the recent few decades call for much more studies and researches; therefore, present authors have carried out this research with the aim of comparison in learning amount of long-distance students by using the two education methods of multi-media and traditional education.

METHOD

With respect to the nature of subject goals and hypotheses, and due to using the results in education and learning, this research is an applied one and could be considered as a semi-experimental project. In this research, the test plan has been performed by using the two test and control groups with pre and post tests activities. Therefore,

after speaking with teacher of science course and briefing him in relation with subject of research and execution method, two classrooms were selected at random. After executing pre-test, it became clear that both classes were almost in the same level in terms of subject and there were no significant differences in their pre-tests results. The research was commenced and in six sessions in two subsequent weeks, one group received traditional education and the other received multi-media education in school site. In this research, in the classroom, the multimedia education was preformed while in the other class, traditional method and teacher's lecturing were used in order to study the effects of independent variables on the learning amount of students in science course. The statistical society of research consisted of all male students of third grade of junior high school in long-distance education system of Zahedan City in the school year of 2008-2009. In order to test research hypotheses, among long-distance education schools, the researchers chose Karafarin school as it was equipped with computer facilities. The size of the sample was 40 students of third grade of junior high school. The students were divided into two groups, formed at random by 20 students in each group. In the course of research, the author-developed learning test was used. The creditability and reliability of the tests were determined by judgment of specialists and Pierson Correlation Method. In specialists' judgment part, the tests were given to 6 teachers of science course and 2 lectures of teaching methodology of Tarbiat Moalem college that after correcting the problems, in sum, 20 questions were found suitable among the total 30 questions and after discussing the matter with science course teacher and briefing him on the subject of research, a pre-test was taken from both classes, that showed both were almost in one level. Then, a class was chosen as control group and the other class as test group separately. The test group received education in 6 sessions in two subsequent weeks in site and the control group received education in classroom in traditional way. After the end of teaching, the post-test questions were given to the students to measure their learning. In this research, the descriptive statistics including average, variance, criteria bias, and average criteria bias and in deductive statistics, the "t" test was used to compare the two groups. Information processing was performed by using spss software.

RESEARCH PLAN

This research used pre-test and post-test plans in control group. The project was made of two test subjects, both were measured twice. In first measurement, a pre-test was taken and the second measurement was done through a post-test.

In this semi-experimental research, one class received multimedia education and the other class received traditional education by lecture, in order to study the

effects of independent variable on amount of learning in science course. The subjects of the research (with smallest information unit) were students. The project consisted of two test groups, both were assessed twice. The first assessment was by pre-test and the second was post-test (the pre-tests and post-tests were parallel for both groups).

With respect to the subject of research and relevant variables, the present research is considered as quantitative researches. Since this research plans to compare two different forms of one variable, following design was used:

TABLE 1- EXPERIMENTAL PLAN OF TWO GROUPS, PRE-TEST AND POST-TEST WITH TEST GROUPS

Test groups	Number	Pre-test	Independent variable	Post-test
Control group I	20	T1	X1	T2
Test group 2	20	T1	X2	T2

FINDINGS

Findings in general show that there are significant differences between scores of students who were taught by multimedia compared to students who received education in traditional method and providing education subjects by multimedia caused an increase in post-test scores and learning. As a result, students who received education by using multimedia showed more learning compared to students who received education in traditional methods.

As this project focused on comparing the averages of the two groups and the scores of both group was in distance; therefore, independent “t” test was used; of course, the pre-assumption of variances equality by using Levin Test was studied beforehand. In continuation, by expressing hypotheses, the results have been described and analyzed by using tables and diagrams.

Hypothesis 1: Presenting materials in multi-media form increases learning compared to traditional methods.

Hypothesis 2: There are significant differences between scores of students who were taught science course by using educational software and students who were taught by traditional methods.

As table 2 shows, the average multimedia groups compared to traditional education is not much different.

TABLE 2- DESCRIPTIVE STATISTICS OF TWO MULTI-MEDIA EDUCATION AND TRADITIONAL METHODS AFTER POST-TEST LEARNING SCORES

Group	average	variance	criteria bias	average criteria bias
multimedia	15.35	4.23	2.06	1.75
traditional	12.70	5.91	2.43	1.39

As table 3 shows, the average multimedia education is higher than traditional group.

TABLE 3- COMPARING THE AVERAGE OF TWO MULTIMEDIA AND TRADITIONAL EDUCATION GROUPS IN PRE-TEST SCORES

Dependent variable	Levin	T		Freedom degree	significance (P)	Certainty distance 95%	
	F	Significance				up	lo
scores	0.35	0.56	0.1	34	0.0001	13.28	5.1

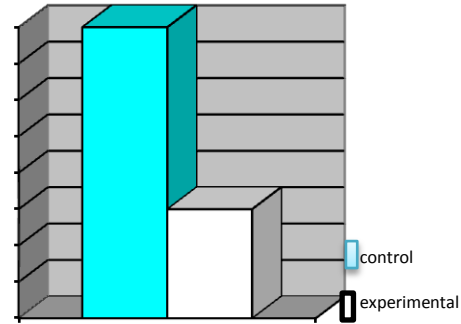


Diagram 1- Average scores of students in pre-test

As table 3 shows, it could be seen that since the significance level of Levin test; that is (0.56) is higher than criteria significance level; that is 0.05; therefore, with 95% certainty it could be said that the variances equality pre-assumptions in both groups have been observed and there is no significance difference between the variance of both groups. Thus, the independent "t" test could be used.

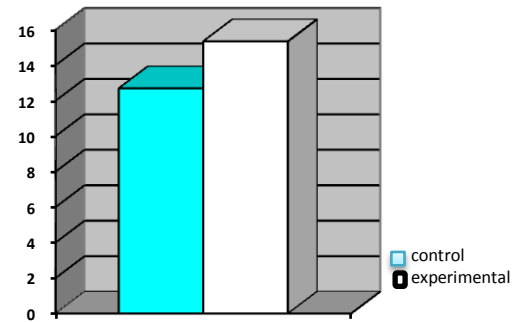


Diagram 2- Average scores of students in post-test

As table 3 shows, in averages comparison test, there is a significant difference between the two groups of multimedia and traditional education methods. In another word, the value of t (0.13) significantly $\alpha=0.01$ with 34 degree freedom is smaller than "t" value of the table (2.42); and therefore, there is no significant difference between the two multimedia and traditional education methods in pre-test scores.

Now, with respect to the significance level obtained for those tests; that is 0.001, since this level has less criteria than 0.01; based on the research hypothesis is confirmed with 99% certainty. Thus, with 99% certainty, it could be said that there is no significant difference between the average of the two groups in pre-test scores and this shows that there are no much differences between the two groups in pre-test scores.

By studying the above diagrams, we could see that there are not many differences between the average scores of the two groups in pre-tests of science. In addition, the criteria bias of the two groups shows not much differences either. However, in order to know if the difference of the averages is significant in post-test scores, the "t" test along with Levin test is used.

TABLE 4- THE INDEPENDENT T TEST FOR COMPARING THE POST-TEST SCORES AVERAGE

Dependent variable	Levin	T		Freedom degree	significance (P)	Certainty distance 95%	
	F	Significance	up			lo	
scores	9.38	0.004	3.	18.28	0.033	11.	0.

Table 4 shows that since the significance level of Levin test is 0.004 and this value is less than 0.05; therefore, in this case, the pre-assumptions of variance equality are not observed and there is a significant difference between the two groups in terms of variance; therefore, the results of "t" test in case of inequality of variances have been presented.

As table 4 shows, there is a significant difference between the two multimedia and traditional education methods in the average comparison tests. In another word, the amount of t (3.63) in significant level $\alpha=0.05$ with 18.28 degree freedom is bigger than amount of t in the table (1.72) and therefore, there is a significant difference between the multimedia and traditional education groups in the post-test. Now, with respect to the significance level that has been obtained for this test;

that is 0.033, since this significance level is less than 0.05; therefore, the research hypothesis is confirmed with 0.95 certainties. Therefore, with 0.95 certainties it could be said that there is a significant difference between post-test scores of students that were taught via multimedia and students who were taught in traditional education methods and presenting subjects by multimedia increased the post test and learning scores. As a result, students who were taught by multimedia, compared to students who received traditional education methods, showed higher learning.

DISCUSSION AND CONCLUSION

The results obtained in this research show that in general, students who received education via multimedia methods show higher learning than students who receive traditional education.

In connection with first hypothesis, the results obtained showed that presenting subjects in multimedia method increases learning than traditional methods. This result is in agreement with the research conducted by Attaran [10] that showed using multimedia increased motivation and promotes the quality of students' learning. In addition, it helps them to learn concepts and subjects better. In another research, Nadjar believed that students who enjoy multimedia education use multimedia learning subjects that help their learning. The research carried out by Eduardo & Fritz (1997) show that learning becomes more enjoyable and attractive via educational multimedia and leads to different outputs such as learning and applying concepts. For this reason, various multimedia has been developed in science field for various subjects. In addition, the results of this research are in agreement with Bayractor [8] research that was a post-analysis on impacts of computer aid education in science education and concluded that computer aid education has positive impact on student's progress in high school and university science education compared to the traditional education method.

Ebrahimi and Hatami in a research studied the role of educational multimedia in teaching kinetic skills and concluded that using multimedia has more impacts on learning basic kinetic skills than traditional methods which is in agreement with the results of present research.

Regarding the second hypothesis, the results revealed that there is significant difference between scores of students who received education by educational software in science class with students who received traditional education. This hypothesis confirms Karami's research [9] that studied the impacts of multimedia in amount of learning in fifth grade students of elementary school for girls and then, after studying the post-test results, showed that the two groups had significant difference with each other. In addition, the research conducted by Melikan and Akhundi [11] on the impact of educational multimedia in treating dictation disorder of special learning showed significant difference between average of scores between education and control groups. As a result, using educational multimedia is effective in treating the dictation disorder of special learning student.

With respect to the analysis obtained in this research that is in line with other researches, it could be concluded that multimedia education methods could increase learning degree of long-distance education students. Therefore, following suggestions are offered:

The long distance education centers should be equipped with modern educational equipment and devices including computer and education multimedia.

To arrange for providing suitable culture and ground by managers and planners for using education multimedia in long distance education centers.

Education authorities could develop various and suitable multimedia that fit potential and needs of long distance education students.

Teachers' knowledge on the role of multimedia could improve their performance in educational situation. Therefore, it is necessary in educational plans, actions should be made to increase teachers' knowledge in this regards.

In this research, since classes had been already organization and the researcher had no option in making classes and organizing it; it was not possible to place participants in classes at random.

Multimedia Program in Learning Some Basic Motor Skills for the Pre-School Children. *World Journal of Sport Sciences* 3 (5): 247-251, 2010.

[2] Amani Tehrani, Mahmoud (2001), Spectrum Viewpoint rather than Polar Viewpoint in teaching-learning of experimental sciences based on new education plan for teaching science, *Journal of education*, Vol. 9830

[3] Mayer, Richard E. (2003). The promise of multimedia hearing : using the same instructional design methods across different media . *Learning and Instruction* . 1392),125-139 (2003).(full text available in : [http:// www. Citeulike. Org](http://www.Citeulike.Org) .)

[4] Zoufan, Shahnaz (2004), Application of New Technologies in Education, Tehran, Organization for Study and Development of Human Sciences Books of Universities

[5] Barati, Akram (2005), Process of Designing Education multimedia, M.A. Thesis, Tarbiat Moalem University

[6] Shahjafari, Tahereh (2004), Development of Standards for Assessing Education Multimedia, M.A. Thesis, Tarbiat Moalem University.

[7] Fardanesh, Hashem (2003), Theoretical Fundamentals of Education Technology, SAMT Publication, Tehran.

[8] Bayraktar, S. (2001). Ameta-analysis on the effectiveness of computer - assisted instruction in science educathon . *Journal of Research on Technology in Education*,34(2), 163-88.(abstract available in:[http:// www.eric. Ed.gov.com](http://www.eric.Ed.gov.com)).

[9] Karami, J (2004), Studying the Epidemiology of Dictation Learning Disability and Impact of Multi-sensory Treatment Method in Controlling this Disability in Elementary School Students of Ahvaz, Ph.D. thesis, Shahid Chamran University, Ahvaz.

[10] Attaran, Mohammad (2003), Determining Necessary Standards for Design and Assessment of Education Multimedia, Tehran, Office of Education Technology

[11] Malekian, Faramarz; Akhundi, Azar (2010), Effects of Education Multimedia in Treating Dictation Disorder in Special Learning Students in Kermanshah City, *Journal of New Thoughts in Education Sc.* 6th Year, vol. 1, Winter 2011

SOURCES

[1] Ibrahim, A. and Haythem, A.(2010). Effectiveness of Using an Instructional