THE IMPACT OF EDUCATIONAL TECHNOLOGY ON THE ACHIEVEMENT IN THE GENERAL SCIENCE SUBJECTS OF THE 6th GRADE STUDENTS

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Abstract

The purpose of this study was to investigate the impact of educational technology (El-Gazzar's model) on the achievement in the general science subjects of the 6th grade students.

The sample of the study consisted of (54) students – males and females – from 6th grade – Abu Deis Coeducation school.

The researcher assigned two groups randomly (control and experimental) group.

To achieve the objective of the study, the researcher collected information by using a multiple choice test of (40) items. Students were given pre-test and post.

. The test was subjected to validity, reliability, and level of difficulty and discrimination measures

The Data were analyzed by using (SPSS) with ANCOVA, the results showed following:-

There was a statistically significant difference at the level ($\alpha \leq 0.05$) in achievement of science due to the method of teaching in favor the group which is experimental, There was no statistically significant difference at the level ($\alpha \leq 0.05$) in achievement of science due to the interaction between teaching method and gender.

Based on these results the researcher recommends the use of Educational Technology (El-Gazzar's Model) in teaching and. especially in teaching science, for the purpose of raising the level of students' achievement. And performing similar studies on other grades, and other units, with larger groups and samples and in several areas in order to generalize the results of this study.

Keywords

Impact, Educational Technology, El-Gazzar's Model, Achievement

1.**Introduction:**

One of the modern and important methods of teaching, computer education and software, through the educational software can learner master the educational goal according to speed and potential, as the learner is the one who controls the presentation of the program and the transition from one screen to another depending on the time that suits him and according to his speed, The learner may be encouraged by his colleagues in the event that he has made a mistake, but learning through computer programs will keep the learner away from the learner. On the embarrassment of the teacher as it is in traditional education, and stimulates his motivation to learn (Farr, 2002).

The program is based on the principle of the uniqueness of education, the interest of modern education, is to teach the learner how to learn, and became interested in the direction of self-learning, where it was usual for most students to take the order of their education after they have the basics of knowledge, and self-learning prevented them from meeting their professors Listening to them, and being guided by their opinions and experiences. Among these Ibn Sina, where he learned by books, as well as Mohammed bin Malik, and others taught themselves through self-learning (Qamber et al., 1995).

The computer has received great attention by educators and specialists in the educational and educational process in our time, and was the prominent interest in computer and software and employment to serve the educational process, and this is evident through the recent educational trends towards the computerization of curricula and subjects, where the goal of preparing computerized programs, Educational programs programmed to offer an interesting presentation and logical sequence, to achieve the desired educational objectives, and give the necessary exercises and examples and educational activities and questions and exercises for the learner, , Providing instant feedback while giving continuous reinforcement. As well as the use of audio, image, video, multiple forms and animation to attract the attention of the learner towards the educational material and provide clarifications, so practiced by the learner self without the need to help the teacher (Hersh et al., 2006).

Al-Gurf (2006) stated that "e-learning programs that replace the traditional curriculum are flexible and provide opportunities for enrichment and revision. The teacher can use multiple teaching methods such as simulation and learning by exploration, experience-based learning and therapy. From diagnosing difficulties that prevent students from mastering a specific point, and offering them additional and alternative explanations and training until they have mastered that point or goal to be achieved.

1.1 Statement of the Problem :

The problem of the study focused on the impact of educational technology on the achievement , of the 6th grade students in the general science subject.

1.2 Questions of the Study : The study tried to answer the two questions:

What is the impact of the educational technology on the achievement of the 6th grade students in the science? Is this impact different depending on the method of teaching, gender and interaction between them?

1.3 Objectives of the Study:

The aim of this study was to investigate the impact of the use of educational technology (El-Gazzar's Model) on the achievement of the 6th grade students in the science.

1.4 Significance of the Study:

The importance of the study became from its attempt to reveal the importance of the use of educational technology as a teaching method, and to employ models of educational design in the educational process.

1.5 Limitations of the study:

This study identified the following determinants

- Human frontiers: Sixth grade students
- Conceptual Limits in the Microbiology Unit of the General Science Book Part II

1.6 Terminology of the Study:

Education technology is an integrated process based on the application of a structure of science and knowledge on human learning and the use of sources of human and non-human learning emphasizes the activity of the learner and his individual system methodology to achieve educational goals and to reach more effective. (El-Gazzar, 2000).

El-Gazzar's Model (2000) : One of the models of education design according to systems approach, which includes five stages (Analysis, Design, Production, Evaluation and Usage).

2. Theoretical Framework and Previous Studies: This contains

2. 1 Theoretical Framework: This categorize to:

2.1.1 Concept Models

The introduction of design models in the preparation of modules and computerized lessons in the educational process and learning to facilitate the design process and preparation in accordance with clear and interrelated steps, facilitated the

educators and teachers to prepare programs and educational units, including computer programs.

Mustafa (1997) cited the advantages of using the design models of education. It aims at unifying teachers 'and teachers' views on the steps needed to plan any share or unit of study. Thus, a systematic method is adopted in planning and evaluating lessons. Learning Objectives.

The education design process of modern science, which has emerged in recent years in the field of education, led to the emergence of different theories of learning such as procedural, cognitive and human theories. These theories aimed at interpreting learning and proposed models of learning. , "The design of education is a science and technology that seeks to describe the best educational methods that achieve the desired educational output and develop, under certain conditions, a link between theoretical and applied sciences in the field of education" (Haila and Ghazawi, 2003).

2.2 Previous studies :

Mujahid (2006) conducted a study aimed at investigating the impact of the computer by revealing the effect of the use of interactive multimedia in the teaching of general science in the ninth grade students on achievement and direction. The results of the study showed that there were statistically significant differences at the level of ($\alpha = 0.05$) in the achievement of the ninth grade students in science due to the teaching method for the experimental group that used the interactive media , Where it achieved an efficiency of achievement equal to (0.6) as measured by the rate of gain for MacGujian. It also achieved an efficiency of achievement equal to (1.2) as measured by the rate of gain for Black, where the size of the impact on students is higher than (0.14) on the achievement of students. The results of the study showed that the use of computer-based interactive multimedia was not effective in female students 'attitudes, as measured by the percentage of MacGujian's gain, as well as for MacLack, where the effect on students was average on female students' attitudes.

Al-Ajlouni and Abu-Zayneh (2006) conducted a study aimed at identifying the effect of both the method of teaching (the design of a computerized teaching bag and the usual ones) and the study of its effect on the achievement of secondary students in the scientific branch in physics, 78 students were divided into three secondary schools. The researchers randomly divided the sample into four groups, two groups of the first (20) students, the second (19) students and two experimental groups (20 students) and 19

students , Where an optical properties module for the two groups was taught The two groups were taught in the traditional way.

The results of the study showed that there are statistically significant differences in the achievement of the sample students due to the method of teaching and the method of teaching using the computerized educational bag. The results of the study showed that there were no statistically significant differences in the achievement of the sample students due to the interaction between teaching method and gender. Males and females were positive, and the results did not reveal the existence of statistically significant differences in the attitudes of the students of the experimental group toward the computerized learning bags with physics due to gender.

Al-Bawi (2006) studied the purpose of the study of the effectiveness of the use of computer multimedia on students' physics achievement and their attitudes towards computer use. The sample was randomly selected from the Eastern Secondary School for Girls of the General Directorate of Education Baghdad / Rusafa II, divided into two sections,) To be the experimental group that was studied using a multimedia computer and has 29 students, and Division B to be the control group, which was studied in the usual way and contains (27) students.

The results of the study showed that there were statistically significant differences at the level of significance ($\alpha = 0.05$) between the mean scores of the experimental group of students who studied using computer multimedia and the students of the control group which is taught in the usual way for the benefit of the students of the experimental group. The results also showed that there are statistically significant differences At the mean level ($\alpha = 0.05$) between the mean scores of the students of the experimental group taught using computer multimedia and the students of the control group, which is taught in the usual way on the measure of the trend towards computer use in learning,

Siskos et al. (2005) examined the effect of MCAI on the achievement of physical education students in Greece. The study sample consisted of 248 students from the fifth and sixth grades of primary schools Serres, Greece, were randomly selected from 10 randomly selected schools (Serres) into three groups, the 64th group using the MCAI. The second experimental group (TA) used the traditional view of teaching, where 88 students and the 96 students were used.

The results of the analysis showed differences in achievement among the three groups in favor of the MCAI experimental group. The researcher shows the importance of employing multimedia and its positive impact on achievement.

Paul and et al. (2005) studied the purpose of the study of the effect of computer use on the subject of force on students' achievement and their ability to solve physical problems. The study sample consisted of 36 learners in two groups. The experimental group consisted of (11) The textbook and the computer program were computerized. The control group consisted of (25) learners and was taught using the textbook only.

The results of the study showed the superiority of the experimental group that used the computer with the textbook in solving the physical problems, and the students developed the ability to plan and discover.

The study sample consisted of 142 students from several universities and colleges (Brigham Small University, Brin College, Hverford College, Emekolata University, University of Wisconsin, University of Washington, University of Wisconsin, Madison). The sample consisted of a control group and a computer experimental group. The results of this study showed that computer use has a positive impact on language learning, The role of the computer and its importance in the educational process.

Vrtacnik (2000) studied the effect of interactive media on students' perception and knowledge of certain chemical concepts (light, chemical changes, photosynthesis, oxygen and hydrocarbons). The study sample consisted of (50) students of secondary school students in Slovenia (26) students in the experimental group and (24) students in the control group.

The results of the study showed that the multimedia used in the computer has had an impact on students' understanding of and knowledge of chemical concepts. This is evidence of the effectiveness of the computer in the educational process and it is effective in increasing the understanding of concepts and concepts of the units.

3. Methods and Procedures

3.1 Methods:

The researcher used the experimental method.

3.2 Study Sample:

The study population: All sixth grade students in the governorate of Jerusalem and its environs, and The sample of the study consisted of (54) students from the sixth grade in the primary school of Abu-deis primary of the UNRWA as an intentional sample Table of distribution of the study sample for the control and experimental groups.

3.3 Instruments of the Study:

After the analysis of the content and the construction of the table of specifications was presented to the experienced and specialized, and then built the test collection, which included 40 paragraphs of the type of multiple choice.

3.3.1 Validity of the Instruments

To verify their validity, the tool was presented to a number of experts, PhD and Masters and BA in Education and General Science working in the field of teaching at universities to express their opinion on the appropriate tool and the affiliation of paragraphs. And found the reliability value which is (0.86)

3.3.2 Study variables:

* Independent variables:

- Method of Teaching (Traditional Method, Technology of Education)
- Gender (males, females).

* Affiliate variables:

- Achievement of the sixth grade students in the general science.

3.3.3 Statistical Processes: The Statistical Software Package in Social Sciences (SPSS) was used.

4. Results:

To answer Question which says : What is the impact of the educational technology on the achievement of the 6th grade students in the science? Is this impact different depending on the method of teaching and gender and interaction between them?

The mean and standard deviations of the post-test of the experimental and control group were calculated as shown in Table (1).

Table (1): The arithmetical averages and standard deviations of the experimental test of the experimental group and the control.

Group	Mean	Standard Deviation
Experimental	33.74	4.63
Control	29.33	6.86

ANCOVA was performed as shown in Table (2).

Table (2): ANCOVA results

Variance Source	Sum of Square	d_f	Mean Squares	F-value	Significance

Covariant	91.59	1	91.59	9.45	0.004
Methods	129.87	1	129.87	13.40	0.001
Gender	2.26	1	2.26	0.23	0.632
Method*gender	15.52	1	15.52	1.60	0.213
Error	397.37	41	9.69		
Total	55753.0	54			

Table (2) shows that the significance level (0.001) is less than the statistical significance level ($\alpha \leq 0.05$). Therefore, the null hypothesis and the acceptance of the alternative hypothesis are rejected with significant differences in the achievement of the sixth grade students in science due to the teaching method.

Modified computational averages and standard error were found according to the teaching method as in Table (3)

Table(3):Marginal Estimated Means and Standard Deviation Errors for Groups

Group	Mean	Stand. Dev. Error
Experimental	33.01	0.69
Control	29.20	0.78

Table (3) shows that the experimental mean of the experimental group 33.01 is greater than the arithmetic mean of the control group 29.20.

It is clear from Table (2) that the level of significance (0.632) is greater than the statistical significance level ($\alpha \leq 0.05$), i.e, the acceptance of the zero hypothesis that there is no difference in achievement according to the gender variable.

Table (2) shows that the significance level (0.213) is greater than the statistical significance level ($\alpha \leq 0.05$), i.e the acceptance of the zero hypothesis that there are no differences in achievement according to the interaction between gender and the method.

5. Discussions:

The results of the analysis showed that there were statistically significant differences in the level of significance ($\alpha \leq 0.05$) in the achievement of the sixth grade students in science due to the teaching method in favor of the experimental group. Students are the sixth grade in general science.

This demonstrates the role of education technology in raising student achievement. The use of educational technology, if well prepared, and based on models of

education design, influences achievement raising, as it is effective in student learning and makes the learning process more exciting and exciting. Make students participate effectively by providing each learner with the opportunity to progress according to their own speed and ability in a flexible and easy way, This proves that their use has an effect on raising students' achievement compared to the traditional teaching method. It contributes to increasing the learner's self-confidence, providing him with immediate feedback and according to his response to the educational situation. The use of these strategies helps to implement the strategies of teaching and learning to better.

The results of the study showed that there were no statistically significant differences at the level of ($\alpha \leq 0.05$) in the achievement of the sixth grade students in science due to gender and the interaction of the teaching method and the gender together, that is, the education technology is good for both genders, Whether male or female,

In addition, both males and females receive the same educational opportunities within the classroom. In addition, both genders receive the same support, encouragement and material and moral incentives from parents, educational institutions or the community. Education technology achieves effective learning for both genders and increases attention and enjoyment of the learning process.

6. Recommendations

In light of these findings, the study recommends:

1. Urge teachers to use the technology of education because of its impact on improving and increasing student achievement.
2. Educational technology contributes to increasing the effectiveness of the education process.
3. Conducting similar studies on other classes and other subjects,

References:

Al - Bawi, M. (2006). *Effectiveness of using computer multimedia on students' achievement of physics and their attitudes toward computer use in learning and teaching*, University of Baghdad, Iraq.

Al-Far, I. (2002). *Computer Use in Education*, Dar Al-Fikr, Amman, Jordan.

Al-Gurf, R. (2006). The effectiveness of e-learning in teaching English at the university level in Saudi Arabia, *Saudi Society for Educational and Psychological Sciences*. Saudi Arabia. http://www.gesten.org.sa/default.asp?pageno=14&iPro=194&iType=16.25/9/2007

Ajlouni, K., Abu- Zayneh, M. (2006). Design of a teaching bag and the study of its impact on the achievement of high school students in physics, *Journal of Educational and Psychological Sciences*, Bahrain, 7 (3), pp150-173.

Al-Haila, M., Al-Ghazawi, M. (2003). *Design of Education*, , Issue 2. Dar Al-Masirah for Publishing and Distribution Printing, Amman, Jordan.

El-Gazzar, A. (2000). *Introduction to Educational Technology*. Girls College, Ein Shams, Egypt.

Hersh, A., ed, Ababneh, Z. (2006). The Effect of Using Two Different Educational Programs in the Achievement of First-Grade Students in Mathematics, *Tishreen University Journal for Studies and Scientific Research*, 28 (1), 55-66 Lattakia, Syria.

Mujahid, M. (2006). *The Impact of the Use of Interactive Multimedia on the Collection of Ninth Grade Students in the General Sciences and their Attitudes towards them*, Unpublished Master Thesis, Al-Quds University, Palestine.

Mustafa, Sh. (1997). *Practical applications on the design of education*, educational qualification (Ed.4 / 97), Institute of Education, UNRWA / UNESCO, Amman, Jordan.

Qamber, M., Al-Sawy, M. and Aliblawi, H. (1995). *Studies in the Origins of Education*, Dar Al-Thaqafa, Doha, Qatar, Issue 4.

Siskos, A., Antoniou ,P., Laparidis, K. & Papaioannou, A.(2005).*Effects of multimedia computer-assisted instruction (MCAI) on academic achievement in physical education of Greek primary students*, Interactive Educational Multimedia, (10).61-77. http://www.ub.edu/multimedia/iem/down/c10/MCAI_and_achievement.pdf.10/11/07

Tawah, M (1993). *Analysis of educational learning process* (E / 44), Education Institute, UNRWA / UNESCO, Amman, Jordan.

Vrtacnik, M.(2000). *An Interactive Multimedia Tutorial Teaching Unit and Its Effects on Student Perception and Understanding of Chemical Concepts*, Westminster Studies In Education.