

# Effectiveness of Using Computerized Educational Packages in Teaching Math Curriculum on the Learning of Student in Eighth Grade at Ma'an City

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## Abstract

The study aims to identify the effect of using computerized based education on Eighth grade achievement in Math. In addition the study aims to identify the effect of gender on students' achievement who received computerized education. The study was based on the selection of students from two schools in Ma'an City one for females and the other for males. The selection was based on the availability of computer labs and a teacher who has technological experience in class. Two groups were chosen in each school; one was a controlled group and the other was the experimental group which used computerized education. The total number of selected subjects was 109 students. The four groups undertook a pretest and comparative analysis showed that there was no similar correspondence between males and females and so a t-test was carried out on the results. The results show differences in performance between the controlled group and the experimental group. The experimental group showed more improvement terms of achievement, for the average score in the post test was (27.444). As for the controlled group, the average score was (24.955). The findings indicated that there were no differences in terms of achievements between female and male students.

**Keywords :** Effect, achievement, computerized education, Ma'an.

## 1. Introduction

Mathematic science rose during ancient ages to face the need of the society to organize his life, treatments and private affairs. Since this science established it is still developing and expanding and its methods are changing and developing as the needs of life in our age (Abu Zina, 2004). We see that math invade the other branches of science, daily life of people and the use of computer expanded in work, industry and trade.

Math methods have several developments where these developments, in addition to the scientific new inventions related to it, affects on teaching mathematics and many of mathematic pedagogy start to exert more efforts to develop it (Al-Sadiq, 2001).

So, development and reform of education received high concern from most of the world states as the base of the human development and put policies and plans which could imitate the economic future of the societies. This arises from principle says that the efficient and trained human resources and scientific brains are the able entity to build and develop society in addition to achieve its welfare. This concern arises through application of comprehensive quality principle in the field of education and concern with the first beneficiary of the service who is the student and the second beneficiary who is the employer who uses the expert and efficient persons after their graduation (Ahmed, 2003).

The comprehensive quality, in the field of educational administration, means the total exerted efforts by workers in the education field to raise the level of the educational product and achieve the highest satisfaction degree of who benefited from the service which are both student and employer. This will lead to increase motivation of students to learn and increase the concern with educational methods and strategies, consider individual differences and concern with talented. In this time where the requirements of knowledge increase we see that the provision of suitable methods, tools and environment for many educational concepts is very difficult matter in the level of schools.

### 1.1 The general purposes of math teaching

The general purpose of education as whole: preparation of the individual for the public and private life to benefit himself and his society.

The general purpose: raise the student level in math especially and in education process generally.

### 1.2 Purposes of math teaching:

The purpose of teaching math are:

- Development of scientific and practical capacities for math teachers.
- Raise education level and evaluate its methods to achieve the best educational result.
- Simplify and facilitate any difficulties may face the teacher.
- Find relations and interrelations among math teachers and with the department to facilitate transmission of educational experiences.

- Provision of chances to exercise good thinking methods and acquire skills to use solves problems method.
- Now the impact of math in civilizational development of man and ensure on its importance in servicing the society.
- Acquire the required skills to understand and discover new relations.
- Formation of proper attitudes and tendencies toward math.
- Self dependency in study math.
- Formation of desired and critical habits.

Computer has high technical properties could facilitates the user way in treatment information by the learner which showed by the media. In some times the presented information may need to show a picture or audio media to achieve the best way for learning (Ke, 2008).

So, to ensures that use of computer as an assistant factor in education will provide a suitable chance to enable each student to learn according to his character and educational environment. A study (Sobh & AlAjlonj, 2003) explained that education by using computer may help to represent the concepts as imagine of triple dimensions, moved pictures and audio media.

Where the internet provides expand services in the field of education, learning, gain information and achievement of communication among users, this leads to create a new view to education in relation to its organization and provision to students. Education doesn't restricted with what done inside the class under supervision of the teacher but the internet provides education chance at everywhere wanted and suitable by the student.

## 2. Importance of the Study

Due to rapid change in educational thinking methods, pedagogy and used tools and strategies in addition to rapid change in employment and application of assessment and evaluation tools, some educational organizations start to apply these procedures without ensure in their results or test it to ensure the extant of its efficiency which may negatively reflects on the total educational efforts and produce negative or reflect results. In light of the huge expansion in using this type of education packages, I found it is important to study the impact of these educational programs on student learning and to what extent it achieves the education purposes in addition to study the negative impacts which may produced as a result of influence with other educational programs may be found inside the class (Shadifat & Arsheid, 2007).

## 3. Problem of the Study

It is noticed that there are rapid development in employing the educational computerized packages in schools related to ministry of education in Jordon for deferent specializations and ages without presence of studies prove the extent of success of these packages in achievement of the educational purposes especially where these packages are used in purposes of collective education, individualize education and the programmed education on teaching computerized mathematics which depends upon principle of stimulus and respond. The study problem defined as trying to know the effectiveness of using computerized educational packages in learning of students in the eight class in mathematics curriculum in Maan governorate through answer the following questions:

## 4. Research Questions:

Are there functional statistical differences at ( $\alpha \leq 0.005$ ) in learning mathematics curriculum refer to employment of computerized educational packages comparing with traditional educational method.

Are there functional statistical differences at ( $\alpha \leq 0.005$ ) in learning of the students in mathematics curriculum refer to gender.

Are there functional statistical differences at ( $\alpha \leq 0.005$ ) in learning of the students in mathematics curriculum refer to interaction between gender and educational method.

## 5. Review of Literature

A study prepared by Nour (2003) aimed to compare between the method of using educational computer in teaching mathematics and traditional methods and impact of it on learning of student in the fourth basic class. The study sample consisted of 74 student from Heli application school in Ain town which followed to Ain educational administration for year 2002/2003. The sample individuals distributed on four groups: two control groups and two experimental groups. The experimental groups studied two units of numbers, addition and subtraction from the mathematics curriculum of the fourth basic class by using computerized educational program. While the two control groups were taught by using traditional method. The researcher did both previous and after tests on the study sample. After the end of study the researcher applied a learning exam to ensure the equivalence the two groups in the mentioned units also it is applied a postponed exam on this sample after one month after application of direct learning exam. To analyze the data the researcher used T-test. The test

indicated that the two sample study were equivalent before start in the study and there are functional differences at functional level in the learning of students in mathematics refer to the educational method in favor of the two experimental groups in the direct exam. Also there are functional differences at functional level in the learning of students in mathematics refer to the educational method in favor of the two experimental groups in the postponed exam. The study recommended to do more studies to determine the effectiveness of using computer as an assistant tool in education for different educational levels and provide more computers in addition to encourage student to increase their computer experience and culture.

In study of Afaneh (2003) which aimed to know the impact of using computer as an educational instrument on student learning in the fifth class on the area unit. The study aimed to inspect impact of using computer as an educational instrument on student learning in the fifth basic class in area unit in comparing with two traditional methods (working papers and traditional educational method). The study tries to answer about question related to impact of using computer in the educational process on learning of the fifth basic class students. The study sample consisted of 86 students (boys and girls) from private schools in Ramala governorates where they are randomly chosen from three schools. They were distributed on three groups: two control groups and one experimental group where both boys and girls are taught together. The researcher used an educational program prepared by him as a power-point file where he showed the material as it was in the curriculum book of the fifth basic class. The student receives some lessons from (10) lessons in the unit with ratio 5 classes per week and totally 12 lessons. All groups study with the same number of lessons and the same subject. The results shows presence of functional differences in favor of the experimental group which studied by using the computer and presence of difference in learning by using computer refers to gender in favor of females.

In Abu Raya (2003) study with address reality and expectations using computer in teaching mathematics in the governmental schools in Jordon. The study sample consisted of 182 of teachers (male and females) of mathematic teachers in the governmental schools related to Aman city. The sample individuals represent 15 of the study population. The second study sample consisted of 81 teachers (male and females) from computer teachers in the governmental schools in Aman city. They represent 23% of the study population. The researcher chose third sample from specialist and officials in the field of educational computer and mathematics. The study reached to the ratio of number of computer labs and the number of computers decreased the acceptable number. Also the decrease of educational programs either ready or locally made for mathematics in the mentioned schools. The results also include that the computer supported the effective teaching of math through diversification of methods and enrichment of teaching mathematics. The computer helps in supporting learning of the student through increase the effectiveness and motivation of students to learn mathematics through precisely and rapidly execute procedures in addition to choose representing examples and figures more than which could be done manually.

Al-Sherif (2002) execute a study aimed to inspect impact of using computer in teaching geometry on learning female students in the eighth class. The study sample consisted of female students in the eighth class in the model school in AlYarmouk University through educational year 2001/2002. The sample individuals were 45 students were divided into two groups: experimental group studied by using computer and consisted of 23 students. The second group was the control group studied through traditional method. The number of the second group was 22 students. The statistical analysis of the results showed that there are functional statistical differences due to the educational method in favor of using educational computer. This proved the effectiveness of educational computer as an educational method. The results of postponed exam showed that there are functional statistical differences refer to the educational method in favor of educational computer. This proved that students who taught by using computer keep the mathematics concepts for longer period more than those who taught without using educational computer. The results also showed that there are functional statistical differences between the two groups on the attitudes measurement in favor of experimental group.

Al-Far (2001) executed a study under title "using computer in teaching". The study aimed to determine the impact of using private teaching type as one of learning types which supported by using computer on student learning in the first preparatory class in subject of groups and their attitudes toward mathematics. The study sample consisted of 240 students from the first preparatory class. The study individuals distributed into two groups (experimental and control). Each group consisted of 120 students. The study results showed presence of functional statistical differences between the means of the two groups in learning in favor of the experimental group in addition to presence of functional statistical differences between the student grades of their attitudes towards using computer in teaching math in favor of the experimental group.

Hamilton (recorded in Gebeily, 1999) had a study aimed to compare studies from 1982-1993 concern with inspection of effectiveness of teaching math by using computer as assistant tool with the traditional teaching method and their impact on student learning in both elementary and secondary levels where the researcher used meta-analysis method to compare. The results compared with Meta analysis similar to the Meta analysis used by Bums on 1981 to compare studies before this year where chose 41 studies contain standard

implications. The results showed functional differences in learning for students in elementary and secondary levels included all capabilities in favor groups who studied by using computer as assistant tool. There weren't functional statistical differences between the sub-groups who had low level in both elementary and secondary levels and high capabilities level for students. There were not functional statistical differences among groups of both female and male.

The study of Gebeily (1999) aimed to study effectiveness of using educational computer in direct and postponed learning of mathematics. The study applied on 65 students (males and females). The study sample was divided into experimental group, received the educational material by using computer, and control group received the educational material by using the traditional method. The study applied on students in the fifth elementary class. The results showed that the experimental group exceeds the control group in learning. The researcher recommended with the necessary to use educational computer in the educational process due to the positive impact of it in fixing the concepts on the long term in addition to benefit from this educational advantage in teaching the basic requirements of the educational material.

Al-Ali (1996) studied the effectiveness of teaching mathematics by using computer for the basic fifth class students. She selected study sample consisted of 44 students (males and females). They were distributed into two groups: experimental and control groups. Each group consists of 22 students (11 males, 11 females). The study subject was geometric shapes unit. The experimental group was taught by using computerized educational program while the control group was taught by the traditional method. The students in both groups subjected to pre and after exams designed by the researcher. Students were given a questionnaire to measure their attitudes towards the computer. The results indicates that there were functional statistical differences in student learning in mathematics at level ( $\alpha=0.05$ ) in favor of the experimental group. There were also functional statistical differences in students' attitudes toward computer in favor of the experimental group. The researcher recommended doing more studies and concerning more modern education methods which depends upon technology in addition to held more qualification sessions for teachers to enable them with high use of those devices.

## 6. Study Sample

The study population consisted of students of the eighth basic class in the education administration of the Ma'an governorate during the educational year 2014/2015. The study applied on the mathematics curriculum. The researcher selected a sample consists of two schools one for males and the other for females with two groups for year school according to the following distribution.

Table 1. Distribution of study sample according to gender and educational method

<b>Educational method gender</b>	<b>control</b>	<b>Experimental</b>
<b>Males</b>	27	26
<b>females</b>	28	28

We selected those two schools in light of the allowed capabilities to produce this study where it should have computer labs equipped by the necessary devices with sufficient numbers and suitable educational experience for teacher in applying those programs. Due to presence two groups in each schools we should ensure the desire to cooperate and provide the necessary facilities by the teachers and administration of both schools.

## 7. Study Procedures

### 7.1 Procedures of preparing the computerized educational program

This package was selected from the packages prepared by ministry of education as part of Intel program; education for future with provision that subjected to arbitration and had excellent evaluation for its containing the basic elements and employing computerizing to serve the educational process. The package should contain evaluation tools prepared according to correct standards as content analysis and according to standard table. The paragraph should enjoy with suitable validity and have clear educational plan, procedures and time plan. The package was re-arbitrated by experts outside the educational administration.

## 8. Study Tools

The researcher prepared pre and after learning exam according to vision of teachers who teaching this curriculum of this class to know the extent of equivalence of both the control and experimental groups before the applying of the program starts.

The researcher built after learning exam according to vision of number of teachers who teaching the curriculum of this class according to the following steps:

- Content analysis of the educational material which will be taught.
- Define the educational aims which will be measured.

- Prepare standards table and distribution of paragraphs.
- Draft and arbitrate of paragraphs.
- Ensure the stability of exams through applying it on future sample from the study sample by using internal consistency test (alpha Cronbach).
- Prepare and edit the instructions related to the exam.
- We ensured the validity of the exam through calculation of the difficulty, bias and opinion of arbitrators in addition to high stability factor.
- Procedures of study application:
- Held meeting with the teachers concerned with applying the program to train them on the application and learn them with the study procedures.
- Apply the pre exam on the study sample.
- Start to apply the program on the experimental sample while the control group will continue to learn by using the traditional method. Supervision on application will be directly with teachers.
- Application process continued four weeks.
- After end of application of the program we applied the after exam on both experimental and control groups.

### 9. Statistical Treatment:

Because the groups weren't selected with complete randomly method, we used dual deviation analysis to inspect the equivalency of the groups where table (3) explains the results of this analysis which showed that there were statistical differences among groups especially between male and female groups this may impose in-equivalency by using dual deviation analysis (Two-way-ANCOVA) to inspect the differences between the two methods and gender in addition to the interaction between them. Table (2) explains the means which explained the difference between the two means which was for males (7.9811) while it was for females (11.50).

Table 2. Results of dual test of the impact of both gender and teaching method variables related to pre exam

Deviation source	Squares collection	Freedom degrees	Means of squares	F	Functional level
<b>gender</b>	333.77	1	333.77	12.656	0.001
<b>method</b>	0.27	1	0.27	0.01	0.974
<b>Gender* method</b>	89.916	1	89.916	3.41.	0.068
<b>Error</b>	2769.55	1.5	26.372		
<b>Collection</b>	13641.0	1.9			

Table 3. Mean and standard deviation of the pre exam distributed according to gender and teaching method

Gender	Method	Mean	Standard Deviation
<b>Males</b>	Control	7.741	6.28139
	experimental	8.9231	4.65552
	collection	7.9811	5.56946
<b>Females</b>	Experimental	12.3929	4.82539
	Control	1.6.71	4.6.547
	collection	11.5...	4.75968
<b>Collection</b>	experimental	9.7818	6.15146
	Control	9.7963	4.66371
	collection	9.789.	5.44..3

Table 4. Results of dual deviation analysis of the student performance in the study groups in the after exam.

Deviation source	Squares collection	Freedom degrees	Squares means	F	Functional level
<b>Gender</b>	61.25	1	61.25	1,316	0,370
<b>Method</b>	4838.7	2	2419,35	51.97	0.019
<b>Gender* Method</b>	93.1	2	46.55	23.99	0.000
<b>Error</b>	337.5	174	1.94		
<b>Collection</b>	5330.55	179			

Table (4) explains that there are functional statistical differences at level ( $\alpha=0.05$ ) refers to teaching method where f calculated value is (51.97) at functional level (0.019) which indicates that the differences between teaching methods were statistically function and in favor of the two experimental groups the first and the second where their means were ( $M=21.7$ ,  $M=27.05$ ). These means are higher than the control group (14.40) which proves that there is impact of the teaching method on students learning.

## 10. Results and discussion

### 10.1 To answer the first question

Are there statistical functional differences at level ( $\alpha \leq 0.05$ ) in student learning of the mathematics curriculum refers to employment of the computerized educational packages comparing with the traditional teaching method?

The study used dual related deviation analysis. Table (5) explains the analysis result where the statistical function value was (0.035) which less than (0.05) which means presence of impact to use the teaching method this means that the use of computerized educational package impacts the educational process and produces difference between the control and experimental groups in favor of the group which has the higher experimental group (experimental group) where the mean of student learning in the after exam was (27.444) which was less than the control group which reached (24.945).

This means that using of computerized educational packages increases student learning. This may due to the following reasons:

The student feels with motivation toward learning because the use of computerized educational packages represents a new form of learning.

Interaction of student with experiences provided to him through using computerized educational packages which makes him acquires knowledge which depends upon more than one sense which make his learning will stay more time.

Make student more able on thinking, creation, work, production and self search which makes him able to face challenges of learning with confidence.

### 10.2 To answer the second question

Are there functional statistical differences at ( $\alpha \leq 0.05$ ) level in student learning refers to gender?

Table (5) shows that the function level of the gender impact reached (0.344) which is more than (0.05) which means that there aren't difference between males and females in learning. This may refers to number of reasons as the two groups subjected to the same teaching methods in addition to presence of the same social and environmental circumstances and they were taught by teachers subjected to the same training programs. Also there aren't studies justify presence of differences in the mental capabilities between males and females. This result agrees with many previous studies.

### 10.3 To answer the third question

Are there functional statistical differences at level ( $\alpha \leq 0.05$ ) of student learning in mathematics curriculum refers to the interaction between gender and teaching method?

Table (5) explains that there aren't differences between both males and females with different teaching methods. This means that there isn't interaction between the two variables (gender and teaching method) or the teaching method which employee computerized educational packages doesn't affect males with different way of females but it affects the two genders in the same direction. This result is logical in light of similarity in the educational and teaching circumstances and absence of differences in mental capabilities of the two genders. Table 5 .Mean and standard deviation of the after exam distributed according to gender and teaching method.

Gender	Method	Mean	Standard Deviation
Males	Control	23.666	9.834
	experimental	26.614	7.489
	collection	25.132	8.738
Females	Control	26.186	5.457
	Experimental	28.243	7.4671
	Collection	27.164	6.871
Collection	Control	24.955	7.959
	experimental	27.444	7.236
	collection	26.185	7.673

Table 6. Results of dual deviation analysis to the impact of gender and teaching method on student learning (after exam)

Deviation Source	Squares collection	Freedom degrees	Squares means	F	Functional level
Previous Exam	2332.26	1	2332.26	64.773	0.00
Gender	32.581	1	32.581	.95	0.344
Method	165.175	1	165.175	4.587	0.35
Gender* Method	38.693	1	38.693	1.75	3.2
Error	3744.715	1.4	36.7		
Collection	81.96	1.9			

## 11. Recommendations

- Call teacher to use computerized educational packages in teaching.
- Held training session for teachers to be trained on preparing the computerized educational packages.
- Do more studies about effectiveness of the computerized educational packages in the educational process.
- Held training circles to math teachers where they could use computerized educational packages.
- Establishment of internet educational sites for different materials under supervision of education ministry where it becomes allowed by learners and teachers with the ability to be used in teaching.
- Establishment of Arabic educational sites on the internet and continues development of it.
- Publish of guide publications about the main Arabic education sites, on the internet, which could be employed generally in the education.

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