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DESIGN, IMPLEMENT AND TEST AN EFFECTIVE ELECTRONIC EDUCATIONAL GAME

Dr. Tareq Saeed Ali Thabet*

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***Corresponding Author**
Dr. Tareq Saeed Ali Thabet

ABSTRACT

this research aimed to design, implement and test an effective electronic educational game and investigate the effectiveness of using electronic educational game of primary school Students in Yemen on direct achievement of fifth grade students in mathematics' regular fractions (remembering, understanding and practicing) skills. For some mathematical concepts of the fifth grade compared to the traditional method. The research sample consisted of (30) students as an experimental group and (30) students as a control group. The experimental group studied using electronic educational game, while the control group studied the units same as in the traditional way. A pre-exam was conducted to measure the achievement of the two groups before conducting the study, and there was no differences between them. An achievement test had been developed in the same units of mathematics to measure direct assessment. The results indicated that there were statistically significant differences in direct achievement, attributable to the method of teaching, and in favor of Experimental group. The research recommends using electronic educational game in teaching mathematics at the basic education stage.

Index Terms: Design, Implement, test, An Effective Electronic educational game, Control group, Experimental group, Mathematical concepts, Pre-test, Post-test, Students' Direct Achievement, T-test.

I. INTRODUCTION

Psychologists agree that play is an important method for understanding and confronting the world, and this is achieved to a degree great for children who often find play a way to unleash their fertile imagination, The user finds more enjoyment in the games he plays and learns a lot

from them, which reflects on him thoughts, influences his directions increases his ability to pay attention, and encourages his imagination.[1]

By combining the idea of educational games with computer programs, it was the educational computer games, which provide productivity and enjoyment to students from all over the world Ages, these games are often in the form of educational matches that keep the student going While he spends his time playing, he is actually learning new information and skills, which connects Between learning and playing, the learning process is accompanied by enjoyment in gaining experience.[2] The "Shawaheen" experiment is one of the experiments that used computer games in Education, where he designed educational games using Flash software, covering some areas Science (human body parts game).[3] The learning results were amazing.

This method reduced time and effort and produced high-quality results efficiency.

There are many educational computer programs that the student can practice on Form a game, in order to achieve the goal for which it was designed. There may be two parties in the game Two competitors, one of whom wins and the other of whom loses. The student may play the game with his colleagues in groups Small, or sometimes competes with the computer program itself.[4]

And witness the games There has been great development and expansion in this field, as it is now benefiting from enormous computer capabilities Represented by using multimedia to present and interact with the investor while playing and learning, In addition to the possibility of conducting tests to evaluate the student's level and providing him with rich statistics Its results at every stage of play, therefore, Computer education has become an alternative to most technology Popular education, and although most computer games rely on foreign languages, And English specifically, some companies have begun to look to wider markets to sell their products It is now offering games in several languages, including Arabic, and some Arab companies have also begun offering games that depend on the Arabic language in dealing, the most important of which is teaching the Arabic language and practicing its rules Grammatical and morphological, and composing poetry using prosodic rules and choosing appropriate rhymes, Educational games are generally included in most educational programs either as part of dictionaries Computer games, such as word and letter games, or by allocating paragraphs and exercises to them after learning Facts, concepts and principles. These games are used to reinforce and make learning more important Attractiveness, training for higher levels of

thinking.[5]

These educational games are designed so that the student feels that he is playing, but with scale Learning has been found to learn creativity and innovation, so if we want to add excitement to the educational process We can use many educational programming styles called educational games, or Simulation games. Current developments in the computer, its components and programs have facilitated the improvement Educational programs, and making education more interesting, which contributed to the motivation of many young students And adults to continue learning through it, regardless of place, time, and age of the student.

The researcher designed an electronic educational game consisting of an explanation of the lessons as well as exercises for each lesson. He used the Visual Basic 6 programming language to do the exercises and the Camtasia 8 program for visualization and Windows Paint to explain the lessons according to the mathematics curriculum in the fifth grade in the regular fractions unit in the Republic of Yemen. the idea of educational games with computer programs, it was The good of educational computer games, which decades of this century witnessed many successive developments in scientific research, technological and educational fields, and this development shows impact on various educational fields, as the bright face of technology would show its fruits in the education process if it is used in the correct manner that meets the needs, capabilities and requirements of students and also suits with the experiences of teachers and with the educational environment.

The more development of technologies the easier learning for the students as we can see in our daily life the majority of children using their tablets or any electronic devices to solve puzzles or play games to reach the target and score points so in this research we are trying to convey this technology to make the students learn to do mathematical operations based on the technology of games, it is an easy way to make them understand mathematics fractions and get used to it by easy way that is why we had seen a great impact of students' performance after learning the technique by playing electronic game.

Education was developed in several stages, the first of which was before 1983, where education was using traditional methods, in that stage communication between teachers and students in the classroom was according to specific criteria. The second stage was between 1984 and 1993, the use of multimedia through operating systems and CDs began Which was the main tools for the development of education, and then the third stage started until the year

2000 when the global information network (the Internet) appeared widely, and since 2001 the second generation of the global information network appeared, as the design of websites on it became more advanced, electronic educational game is one of the methods of education in delivering information to the learner, in which modern communication mechanisms are used; From a computer, networks, multimedia, search mechanisms, electronic libraries, as well as Internet portals, whether in the classroom, during or outside the teacher's working hours, to achieve the main objective of using these technologies in education, which is to deliver information to the learner in the shortest time, least effort and greatest benefit.[6]

The information revolution and globalization have also provided modern methods of teaching, discussion and communication instead of traditional methods based on indoctrination, memorization, pressure and stifling students' talents, by providing teaching methods that take into account talents and abilities, achieve flexibility in performance development and achieve individual learning.[7]

In this era, children of todays are growing and they have to deal with a huge amount of information and are exposed to complex daily problems through what technology provides them with unprecedented thinking tools that provide them with strong opportunities to learn and understand the concepts of their age by experimenting with technology and using it in the learning process. It is known to us that teachers are always looking for ways to help them perform their educational functions in order to access to better education, and some of them use the means of technology, including the computer and the Internet. The computer provides an interactive learning environment, and the Internet helps to deliver knowledge as quickly and easily as possible, enabling learners to deal effectively with information. Rather, the matter extended to entertaining and exciting electronic games that provoke Children's Attention.[3]

It is known that play is an innate tendency that exists in most of the individuals, especially the early stages of life, and is considered an important educational mediator that contributes tremendously to the formation of the child's personality as it gives him the opportunity to use his mind and increase his ability to understand with the presence of the factor of suspense and attraction to the child's attention, and he can learn the concepts of counting, arithmetic operations, weight, size and belonging recognize shapes, knows the concepts of right and wrong, and a lot of other things.

Principles and concepts, as the child can express himself and his needs that he cannot express

in reality through play.

Some games are free and are under the supervision of the teacher and without guidance from him, and some are directed to be played by him. The student is under the supervision and direction of the teacher; these games often follow organized steps and rules.[8]

Mathematics is one of the most important subjects, and perhaps the most difficult of all other subjects, due to their educational nature, are focused on them on numbers and abstracts. It becomes more acceptable to learners, especially at the stage of learning Elementary if it depends on tangible things by which the learner can perceive the truth Mathematical knowledge and uses it in his daily life.[9]

The subject of regular fractions is one of the most difficult topics that students face in mathematics because of the change in the method of arithmetic.

Stresses play a vital role in educational performance while raising children in their first levels, because of the importance, capabilities and characteristics of this period, it is required to shape the child at this crucial formative stage of his development.[10]

Play is the life of a child that makes him feel happy, and tends to create a world of illusion and imagination. In it, he exercises his pleasurable and confident experiences, without fear of interference others. As stated in psychoanalytic theory, play can be a starting point for exploration and treatment for mental illness, it is a process of pastime and entertainment to help relieve Tension and agitation.[11]

Educational games are among the modern means and methods used in teaching subjects as different as mathematics, sciences, social sciences...etc.[12], Due to the many benefits achieved from its use, especially as we live at the beginning of the century The twenty-first century, in light of the explosion of the technological revolution in various areas of life, and this calls for To the need to work on preparing our children to live with the data of this century.[13]

By increasing their acquisition of knowledge and experience in various educational subjects, especially mathematics, given its importance and its many uses in different areas of life.[14]

This course (Normal Fractions) includes the following subjects: **1**-Review Fraction, **2-** Compare and order fractions, **3-** (Add, Sub, Multiply, Dividing) fractions.[15]

Procedural Definitions

Design: The Researcher defines the design, that phase in which envisages a full programming and project, or the outlines of what should be the content effective electronic educational game. The objectives of the training material and scientific activities,.... etc., it is the process of making decisions on the best ways of Education. It provides appealing to achieve desired change in knowledge and skills for students. The content of a decision math fifth grade through a recognized scientific steps in design, represented in five steps are (analysis, design, development, implementation and evaluation).

Implement: The Researcher Define the Implement is: use an Effective e-learning system for decision of math, level 5, which had been designed in the positions of real educational non-artificial and application with the study groups that have been chosen.

Test: The Researcher defines the test: That expression quantitative value due and remaining on the use of the e-learning, whether they achieve positive or negative.

An Effective Electronic educational game: It is a computer program designed and programmed by the researcher. It was programmed in Visual Basic and Camtasia for making videos, well prepared.

To teach the concepts of multiplication, division and fractions from the mathematics book for the fifth grade in Yemen, where the student was the main element participating in these games.

Direct achievement: It is the result of what students learn after completing the study of the subject directly, and it is measured by the total marks obtained by the student in the test which was prepared for this purpose.

The educational material has a period of up to three weeks, measured by the sum of the marks that were given.

The student obtained it in the first test itself.

Mathematical concepts: a set of concepts of multiplication, division and fractions that students learn From the mathematics book for the fifth grade in Yemen.

The traditional method: It is the method that presents the educational material in the usual ways.

Using the usual teaching aids, such as the board, chalk, paper and pen, and the basic role for the teacher.

The Research problem

This study comes as an attempt to improve the academic reality by using new methods and techniques in this study An attempt to investigate the effectiveness of educational games, their advantages, production methods, and the best programs for designing electronic educational games is an attempt to study the obstacles of employing electronic games in the process Educational.

The Research importance

• Keeping pace with global and local trends that call for the necessity of benefiting from modern technologies and employing them in Educational process .

• Helping students raise their academic achievement by using modern teaching methods Different from traditional methods.

• Providing examples of electronic educational games and their design programs.

• Paying teachers to produce electronic educational games.

The Research aims

• Explaining the benefits of using electronic games in the educational process.

• Explaining the standards and specifications that a successful designer must have.

• Explaining the stages and methods of producing electronic educational games.

• Clarifying the educational theories on which the process of designing and producing educational games is based.

The Research Hypothesis

1-There are significant differences at level of α (0.05) between the mean scores of the direct achievement of experimental group and control in Remembering skills.

2-There are significant differences at level of α (0.05) between the mean scores of the direct achievement of experimental group and control in Understanding skills.

3-There are significant differences at level of α (0.05) between the mean scores of the direct achievement of experimental group and control in Application skills.

The Research Methodology

The research was carried out using the experimental methodology in which the 30 student were treated as an experimental group and 30 students as control groups. This experimental group had studied the course of fraction instrumentation being programmed using electronic educational game, the control group had studied the course of fraction by traditional way.

II. EXPERIMENTAL DESIGN

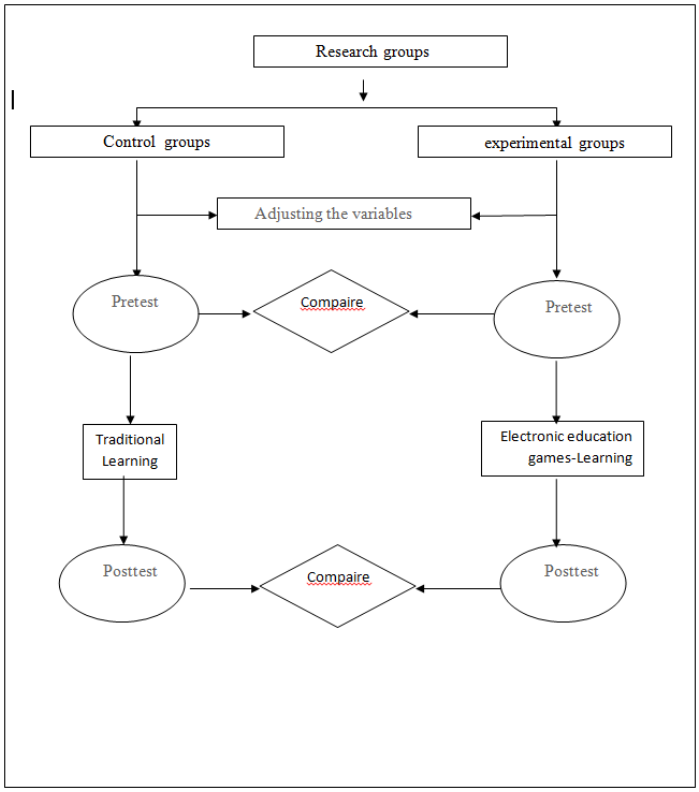


Fig.1: Experimental Design Research.

A. Variables Calculations and Statistical Processing Research Importance.

Elements of electronic educational games.

Each electronic game generally consists of the following elements.

-Game Idea: describes the goal of the game and its basic points.

-Start game : describes the contents of the game's start screen.

-Game stages: describe how the game becomes more difficult as it progresses, and how the user completes each stage and achieves its objectives.

-Game Events: explain the game points for which the player is rewarded or punished.

-End of the game: explains what happens when the player loses, wins, or gets the highest score.

-Game Inputs: describe the way the player communicates with the game, through the buttons used on the keyboard, mouse, or joystick.

-Game graphics: which depict the characteristics of the game's components and parts.

-Game Sounds: Musical sounds and sound effects that are issued during the events and stages of the game.

-Game screens: that is, the visual and audio components that describe the game during its various stages. The main screens in any game are: the title screen, the gameplay screen, and the win or lose screen.

-Game Guide: It explains how to deal with the game.

Stages of designing electronic educational games

First: Analysis stage.

1. Task analysis: In which the general objectives of the educational game program are determined, which are the objectives that The game seeks to achieve this.

2. Analysis of learners: such as their ages, educational levels (grades), and cultural levels, Social, economic, as well as their previous knowledge, skills and attitudes towards the educational subject and their psychological characteristics, it is also important in the design of electronic educational games to be determined the skills and knowledge that the learner must have before using it, such as the skill of using the device the educational or language skill used.

3- Content analysis: Here the content is identified and selected.

4. Analysis of resources and limitations: such as the availability of a certain authoring program and the unavailability of another or difficulty in using it.

Second: The design stage

This stage includes the following steps

1. Setting procedural goals: These are behavioral goals that can be measured, where the goal is transformed General refers to a set of procedural objectives that each contain one simple point that can Measure it.

2. Determine the authoring program and the device on which it will be used: such as using PowerPoint, Micromedia Flash, or Jclic to produce educational games for devices running Windows, or using XCode or GameSalad for devices running iOS, such as the iPhone and iPad.

3. Determining patterns of response and feedback: that is, determining how the learner responds (with the mouse - with a keyboard).Keys - by touching the screen) depending on the type of electronic device and the capabilities of the software used to produce the game. As well as determining the type of feedback (only he will be informed of the correctness or error of his answer or whether he will be commented on). on her) .

4. Make a preliminary outline of the frames (screens) of the educational game: which is everything that appears in front of the learner in a certain moment, and you will interact with it,

and all the menus and buttons drawn. When designing the screen, you must taking into account the technical and educational standards together until it comes out in a decent and simple way.

Classification of educational software screens

-The start screen shows the name of the game, and often this screen does not require the learner's response, but rather moves automatically for the next screen.

- The introduction screen, which aims to excite the learner to play the game, either by the presence of a welcoming cartoon character It is a symptom of a problem with the game, and we may dispense with it depending on the design and topic of the game.

- Menu screen: It is considered the main screen of the game and contains a number of buttons to move from one part to another else, the buttons can be divided into stages or steps that range in levels with their goals.

5. Structural evaluation: It is the continuous evaluation of each of the steps that the designer finishes preparing It is presented to a group of experts in the subject, such as teachers and specialists in the field Instructional design and educational technology. Based on their opinions, the design phase is modified and developed.

Third: production and development stage.

At this stage, the chosen authoring program is used to convert the initial screen layout into.

An electronic educational game by following the following steps.

1. Preparing the required multimedia: by collecting ready-made media, selecting them from the Internet, or producing them Accurately if not available. All media (ready and produced) are placed in one folder Facilitates the production process.

2. Producing the game in its initial form: by designing the frames, frame by frame, and connecting the frames And the branches.

3. Structural evaluation of the game: After completing the design of the educational game in its initial form, it is presented

Experts must make adjustments. The program is tested on a sample similar to the target sample In order to collect their opinions and make the necessary amendments.

4. The game is in its final form: it is being tested on several devices to ensure it works with procedures Amendments when any error is discovered. Thus, the electronic educational game is ready in its form Final publication.

Characteristics of electronic games

There are a variety of electronic games in general and educational ones in particular Features, most of which revolve around attracting the user's attention and arousing his desire to move forward towards achieving the goal and overcoming the challenge, Sufi et al. mentioned.

Factors, the most important of which are

1. Movement: Moving things attract the learner’s attention more than static things.
2. Novelty: New stimuli attract the learner's attention more than familiar stimuli.
3. The nature of the stimulus: The picture is more arousing the learner’s attention than the writing, and so are pictures of people more interesting than pictures of inanimate objects.
4. Change of stimulus: A changing stimulus is more arousing the learner’s attention than a stimulus that is fixed in place, or on one speed, a specific color, or a specific size.
5. Synchronization: Stimuli of all kinds, including image, sound, and text, must overlap in front of the learner In a parallel and consistent manner, and proportional to the speed of his use of the electronic game.
6. Sequentially: The association between two stimuli must correspond to the temporal order of the information contained in them Scientific subject, as this facilitates the process of integrating new experiences with previous experiences for the learner Its cognitive structure, which leads to the learning effect remaining as long as possible.
7. Discrimination: The presentation of stimuli in front of the learner must be based on the principle of contrast, which...

It includes the processes of comparison, selection, sorting and classification, which prompts the learner to develop concepts Within its correct methodological framework.

8. Re-presentation: Re-presenting the stimulus attracts the learner’s attention and focus again. Thus, to fix the information in his mind.

Educational computer games are the most common and interesting interactive software, as the computer is based on...

The way the software excites the students and motivates them to learn by playing, so the game is entertaining on its surface, but at its core, it includes a specific concept or skill.

Fig.2: Process of Building Electronic courses Model(ADDIE)[15]

Challenges of employing electronic educational games.

Despite the various features and multiple benefits of using electronic educational games in The learning process, but there are some drawbacks to it, including what was mentioned by (Al-Harbi 1020 AD, p. 31).

Which

After completing the experiment, I have collected the data to be analyzed used SPSS -18, program, two independent groups .The following relations were used in this research to measure the students' gain in achievement after studying fraction course using the electronic educationalgame approach and student studying by traditional way, to compare between them,

1-Effect Size: How much change the independent variable will affect the students' direct achievement. In this research I mean how much change the electronic educational game approach will affect the fraction students' direct achievement. Statistically, t-value with degrees of freedom df.

2-Descriptive statistics.

3-t-test: The t-distribution is a bell-shaped, symmetric about the mean distribution, used when the sample size equal or less than 30 and the variance is normally or approximately normally distributed. It is actually a family of curves based on the concept of degrees of freedom, which is related to sample size (df = n-1). As the sample size increases, the t- distribution approaches the standard normal distribution.

III. RESULTS

A. Two independent samples statistics of pretest 1: **Remembering**

To ensure that the two groups of the study were, the arithmetic means and deviations were calculated The standardized marks of the study sample students on the pretest test, according to the different levels of the study variable: the method,and tables (2). It is clear from this table and table (1) that the mean is (3.0756) and (3.2124). The computer t value equal (-0.403) at the degree of freedom equal (55) with statistical significant (0.632). This is greater than the claimed level of significance α (0.05), therefore the two groups are equivalent in Achievement (Remembering).

Table 1: Descriptive Statistics for Achievement (Remembering), pretest

Test	N	Mean	Std. deviation
Experimental	30	3.0756	1.36725
Control	30	3.2124	1.14312

Table 2: Achievement (Remembering) independent two samples t-test, pretest.

Achievement	T-value	df	P-value
Experimental	-0.403	55	0.632
Control			

B. Two independent samples statistics of pretest 2: **Understanding**

To ensure that the two groups of the study were equal, the arithmetic means and deviations were calculated The standardized marks of the study sample students on the pretest test, according to the different levels of the study variable: the method,and tables (4). It is clear from this table and table (3) that the mean is, is (3.2564) and (3.7650). The computer t value equal (-1.621) at the degree of freedom equal (55) with statistical significant (0.087). This is greater than the claimed level of significance α (0.05), therefore the two groups are equivalent .

Table 3: Descriptive Statistics for Achievement (Understanding), pretest.

Test	N	Mean	Std. deviation
Experimental	30	3.2564	1.36725
Control	30	3.7650	1.14312

Table 4: Achievement (Understanding) independent two samples t-test, pretest.

Achievement	T-value	df	P-value
Experimental	-1.621	55	0.087
Control			

C. Two independent samples statistics of pretest 3: **Application**

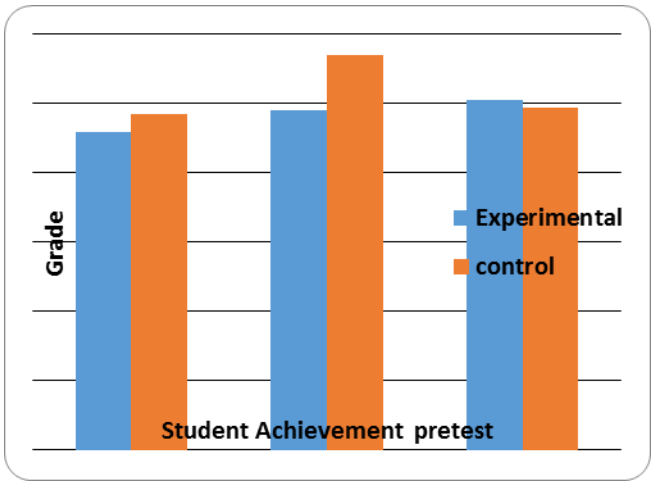
To To ensure that the two groups of the study were equal, the arithmetic means and deviations were calculated The standardized marks of the study sample students on the pretest test, according to the different levels of the study variable: the method,and tables (6). It is clear from this table and table (5) that the mean is (3.4952) and (3.3140). The computer t value equal (0.156) at the degree of freedom equal (55) with statistical significant (0.859). This is greater than the claimed level of significance α (0.05), therefore the two groups are .

Table 5: Descriptive Statistics For Achievement (Application), Pretest.

Test	N	Mean	Std. deviation
Experimental	30	3.4952	1.36725
Control	30	3.3140	1.14312

Table 6: Achievement (Application) Independent Two Samples T-Test, Pretest.

Achievement	T-value	df	P-value
Experimental	0.156	55	0.859
Control			



D. Two independent samples statistics of posttest 1: Remembering

With regard to the first hypothesis: a statistically significant difference was found at the level of α (0.05) between the mean of the direct test due to treatment (teaching method In favor of the experimental group, from table(8) and table (7) its mean was (5.2743) compared to In the control group, whose mean was (4.2741) The computer t value equal (3.015) at the degree of freedom equal (57.899) with statistical significant (0.006). this is less than the claimed level of significance α (0.05), the collection Direct mathematical concepts by the students of the experimental group and who learned Using computerized educational games was better than

the students of the control group .And those who learned the same subject in the traditional way, which means Accept the hypothesis .

Table 7: Descriptive Statistics for Achievement (Remembering), posttest.

Test	N	Mean	Std. deviation
Experimental	30	5.2743	1.36725
Control	30	4.2667	1.14312

Table 8: Achievement (Remembering) independent two samples t-test, posttest.

Achievement	T-value	df	P-value
Experimental	3.015	57.899	0.006
Control			

E. Two independent samples statistics of posttest 2: Understanding

With regard to the second hypothesis: a statistically significant difference was found at the level of α (0.05) between the mean of the direct test due to treatment (teaching method In favor of the experimental group, from table(10) and table (9) its mean was (6.8200) compared to In the control group, whose mean was (5.3541) The computer t value equal (4.319) at the degree of freedom equal (55.121) with statistical significant (0.00). this is less than the claimed level of significance α (0.05), the collection Direct mathematical concepts by the students of the experimental group and who learned Using computerized educational games was better than the students of the control group. And those who learned the same subject in the traditional way, which means Accept the hypothesis.

Table 9: Descriptive Statistics for Achievement (Understanding), posttest.

Test	N	Mean	Std. deviation
Experimental	30	6.8200	1.21343
Control	30	5.3541	1.51960

Table 10: Achievement (Understanding) independent two samples t-test, posttest.

Achievement	T-value	df	P-value
Experimental	4.319	55.121	0.000
Control			

F. Two independent samples statistics of posttest 3: Application

With regard to the third hypothesis: a statistically significant difference was found at the level of α (0.05) between the mean of the direct test due to treatment (teaching method In favor of the experimental group, from table(12) and table (11) its mean was (7.5100) compared to In the control group, whose mean was (5.4321) The computer t value equal (4.608) at the degree of

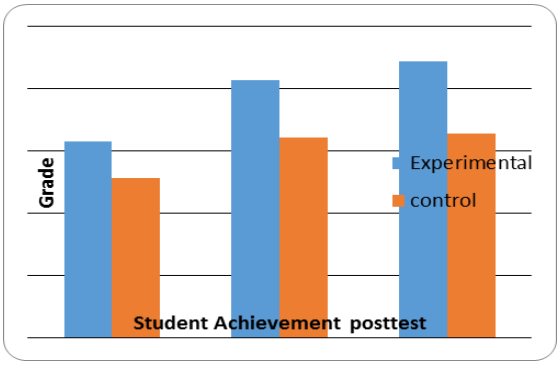
freedom equal (57.214) with statistical significant (0.00). this is less than the claimed level of significance α (0.05), the collection Direct mathematical concepts by the students of the experimental group and who learned Using computerized educational games was better than the students of the control group. And those who learned the same subject in the traditional way, which means Accept the hypothesis.

Table 11: Descriptive Statistics for Achievement (Application), posttest.

Test	N	Mean	Std. deviation
Experimental	30	7.5100	1.48742
Control	30	5.4321	1.65807

Table 12: Achievement (Application) independent two samples t-test, posttest.

Achievement	T-value	df	P-value
Experimental	4.608	57.214	0.000
Control			



IV. CONCLUSIONS

The goal of any learning activity is for learning to take place. A common way to measure the effectiveness of instruction is to measure learner achievement. Measuring learner achievement in electronic educational game environments requires special attention. In fact, traditional methods for measuring learner achievement can be applied to electronic educational game courses with some forethought and modification. Quizzes, exams, team and individual projects, as well as written assignments, can all be used in electronic educational game courses. The use of electronic mediums can even make grading of tests and quizzes easier because scores can be tabulated immediately following the completion of a quiz or test, providing quick and accurate feedback to learners. When examining the descriptive data concerning the achievement pretest and posttest scores for experimental and control groups, it was found that there is an increase in the mean of experimental after the application of the electronic educational game of the course. Also, the standard deviation in the post test of experimental

group is reduced compared to the standard deviation in the post test of control group which means less data variations and pointed out that the student's scores are around the mean. Therefore the hypothesis stated that (There are significant differences at level of α (0.05) between the mean scores of the achievement of posttest for experimental and control groups) was Accepted.

From this discussion, it is clear that electronic educational game approach has good efficiency in learning and improves the students' direct achievement and attitudes toward this new systematic way of learning using the new technology based on computer and multimedia tools. After the results of the research have been lighted, the researcher would like to suggest the following points.

- Inviting teachers and parents who find their child weak in one of the mathematics subjects or For fear of it, he sees him using an electronic educational game that improves his level of study and helps him To link mathematical concepts and learn operations in a fun and entertaining way.
- Encouraging teachers to employ electronic games in teaching mathematics, and to take advantage of websites Electronic games that contain games suitable for the subjects they are studying.
-Working to link school curricula with electronic games, especially in the early school stages.
- Paying attention to the issue of mathematics anxiety and striving to reduce its level among students by various means and methods Teaching, especially electronic games.
- Urging researchers to do more studies that are concerned with the effectiveness of electronic games in teaching Maths.

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1. Author Tareq Saeed Ali Thabet, received his Ph. D (Computer Science) from SRTM University, he is an Assistant professor in Tur Al Baha University College, Lahj University, Lahj, Republic of Yemen, and he is currently the department head of information system in Faculty of computer & information, Socotra Archipelago University, Socotra, Republic of Yemen.

He has published many research Papers in journals and souvenirs as well attended and participated in national and International conferences and workshops.