

"The Effect of Using the Circuit Wizard Program in Acquiring the Concepts and Electronic Practical Skills of the Eighth Grade Students in the Field of Technology"

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Abstract

This study aimed to study the effect of using the Circuit Wizard program in acquiring electronic concepts and practical skills for eighth-grade students in technology education in Hebron.

The study problem was identified in **the following main question:**

What is the effect of using the Circuit Wizard program on acquiring electronic concepts and practical skills for eighth-grade students in technology?

There are **two hypotheses** for the study: There are no statistically significant differences at the level of significance ($\alpha \leq 0.05$) between the average scores of the experimental group students and the average scores of the control group students in the test of electronic concepts and practical skills, as well as in the observation card for the electronic practical performance skills.

In order to verify the validity of the hypotheses, the researchers built **the study tools**, which consisted in building the achievement test for the practical electronic cognitive concepts and skills, which consisted of (35) paragraphs. The two researchers presented the tools to a group of arbitrators, some of whom are experts in education and teaching methods, and some of them are experts in technology, and the proposed modifications were made.

The two researchers chose an intentional sample consisting of two divisions and applied the system of the experimental and control groups, and the number of sample students was (24) students from the eighth grade students at Palestine Basic School for Girls, and a study division consisting of (12) students was chosen to represent the experimental group, and another division represented The control group consisted of (12) female students from the same school as the experimental group, and the researchers used according to the nature of the study **the experimental method:** to study the effect of using Circuit Wizard on acquiring electronic concepts and practical skills in technology education for eighth grade students, where the experimental group received teaching using a program Circuit Wizard, while the control group was taught in the traditional way.

The data were collected and analyzed statistically using the SPSS statistical program, in order to test the validity of the study's hypotheses, by conducting a t-test for two independent samples and Multy Way Anova analysis.

After verifying the validity of the two hypotheses, **the results of the study were as follows:**

- 1) Statistical treatments proved the effectiveness of using the Circuit Wizard program in developing the acquisition of practical, cognitive and performance electronic concepts and skills, as the experimental group outperformed the control group.
- 2) There are statistically significant differences at the level of significance ($\alpha \leq 0.05$) between the average scores of the experimental group students and the average scores of the control group students in the electronic concepts and practical skills test, as well as in the observation card for the electronic practical performance skills, using the Circuit Wizard program.

In light of the previous results, the following **recommendations** were suggested: holding training courses for technology teachers and educational supervisors to train on the use of these programs in implementing the practical activities mentioned in the technological education courses, especially in the basic stage.

Keywords: Circuit Wizard, electronic concepts, electronic practical skills

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I. Introduction:

Our current world has witnessed a tremendous technological development, but rather it is a scientific technological revolution that has many positive effects in various areas of life that have great effects on human life, as technological development was walking in a hurry and that is all due to man, and this development helped us to think of mastered work and diligence And insisting on searching for ways of how the student learns, communicating the idea and achieving the required goals, many programs have appeared in our time, especially simulation programs, whether those in electronic, physical or chemical circles, and as we know that we live in the era of progress, development and the Internet, and this development led to a shift The world is to a small house, but to a small room.

Therefore, it became obligatory for every human being in human society to develop according to the development of the tools of science and technology, so that he can adapt and coexist in an era in which science and technology prevailed, and this development has led to the complexity of relations between science and technology, and extended to strongly affect human society and became science and technology Society is a trinity related to the level of progress, sophistication and the quality of life in human societies. (Al -Zaanin, 20019)

Afana and others (2005) mentioned that simulation programs are characterized by providing unconventional educational situations for the learner, in a way that raises his thinking, and uses the capabilities of the advanced computer and that other media does not enjoy, and it is also possible to study procedures and operations that are difficult to study in traditional ways, It also provides the opportunity to apply some of the skills that have been learned in educational situations, as the learner may not have the opportunity to apply them in the real environment. In most cases, the situation is suitable for learning and training skills with computers, which is very similar to the real world.

The two researchers believe that the virtual laboratories are among the simulation programs that are of great importance in the learning process, whether they are electronic, chemical or physical departments, because of their great effect on drawing the student's attention and the student's achievement, and these laboratories have an experimental nature at the top of mastery and accuracy It helped to apply a lot of activities and experiences, whether by remote application or in the classroom, this matter increases the student's motivation for learning and love to explore and reconnaissance, and also help build knowledge and develop thinking for the learner.

Importance of the study:

- 1) It gives an opportunity for teachers to diversify their teaching methods, using virtual laboratories and simulation programs, especially if the education is electronic.
- 2) Simulation programs in general are an appropriate teaching method for developing students ' electronic process skills.
- 3) It provides an opportunity for teachers, teachers and students to conduct experiments and activities that they cannot conduct in ordinary laboratories because of the lack of tools and materials due to their high cost or difficulty of conducting them, or because of distance learning or the possibility of failure of the experiment and not reaching the required results or malfunction in some parts .the Circuit Wizrad program was a suitable alternative for conducting experiments and activities for the remote sensing and control unit due to the current situation and with the spread of e-learning.
- 4) Getting to know the Circuit Wizrad program may help generate positive trends towards the way the program is used in carrying out many different experiments and activities, which increases the effectiveness of teaching, increases the motivation of students to learn, and helps students to reach the required results of activities, especially with the spread of distance learning.

Study objectives:

The study seeks to achieve the following objectives:

- Determine the impact of using the Circuit Wizrad program in acquiring electronic concepts and practical skills among eighth grade students in the subject of technological education in Hebron, by focusing on basic concepts and electronic practical skills in the remote sensing and control unit.
- Revealing the significance of the differences between the average grades of students studying using the Circuit Wizrad program and those studying in the usual (traditional) way in the test of concepts and electronic practical skills and in the observation card for electronic practical skills performance.
- Revealing the significance of the differences between the average grades of students studying using the Circuit Wizrad program and those studying in the usual (traditional) way in the electronic practical skills performance note card.

The Study Problem:

The problem of the study boils down to the low level of eighth grade students in imagining how to install electronic circuits associated with the remote sensing unit for technology research, especially with the current situation and the spread of electronic education, this is what the two researchers touched upon through their teaching of the remote sensing unit for technological education, due to the difficulty of installing and imagining it, and God willing, in this study we will learn about the impact of using the Circuit Wizard program in acquiring Electronic practical concepts and skills among eighth grade students in technological education research, by answering the following main question:

What is the impact of using the Circuit Wizard program on the acquisition of electronic concepts and practical skills among eighth grade students in technology research?

It includes the following sub-questions:

- 1) Is there a statistically significant difference between the average scores of students in the experimental group and the average scores of students in the control group in the electronic concepts and practical skills test
- 2) Is there a statistically significant difference between the average grades of the students of the experimental group and the average grades of the students of the control group in the observation card for practical electronic performing skills.

Hypotheses of the study:

- 1) There are no significant differences at the level of ($\alpha \leq (0.05)$) between the average scores of students of the experimental group and the average scores of students of the control group in the cognitive test of electronic concepts and practical skills.
- 2) There are no significant differences at the level of ($\alpha \leq (0.05)$) between the average scores of the students of the experimental group and the average scores of the students of the control group in the observation card for practical electronic performing skills.

Study limits:

- ✓ Human and spatial boundaries: the study was conducted on eighth grade students at the Palestine basic school for girls affiliated to the Directorate of education in central Hebron.
- ✓ The limit of time: the study was conducted in the second semester of the academic year 2021/2020.
- ✓ Limit the objective limits:
 - A. the study was limited to the first module of the eighth-grade technological education textbook (remote sensing and control).
 - B. the study was limited to using the Circuit Wizard program to acquire electronic practical skills, and presentations were used for concepts that cannot be studied using the Circuit Wizard program.

Terminology of the study:

- Circuit Wizard program:

It is a simulation program that specializes in designing electrical and electronic circuits on a computer, as the learner can design electronic and electrical circuits on this program with ease and mastery, and be similar to reality, so that it gives you enough space to assemble your own circuit, and then get the required results, and saves time, effort and money because it dispenses with traditional laboratories or electronic parts such as an experiment board or even examination tools, gives the result effortlessly and shows you your mistakes if any.

- Electronic concepts:

Terms that carry ideas related to electronic facts, phenomena and processes contained in the remote sensing and control unit from the textbook of technological education for the basic eighth grade.

- Electronic practical skills:

It is the motor and cognitive ability through which the learner can plan, think, install electronic control circuits, find out the causes of their malfunction and try to fix them, taking into account the element of time, quality and material cost, measured by the degree obtained by the learner in the electronic practical skills test and the observation card of the electronic practical skills performance in the remote sensing and control unit from the textbook of technological education for the eighth grade basic.

- Simulation:

It is an educational method used by the teacher sometimes to bring the learner closer to the real world by providing a learning environment similar to the real world, and the simulation achieves a specific goal, as the learner through simulation can practice certain skills, which increases the possibility of practicing experimentation, and brings them closer to understanding the real world.

- Basic eighth grade:

It is the eighth stage of basic education according to the Palestinian educational system, and the average age of students in this grade is (13-14) years.

Theoretical framework and previous studies:

Theoretical framework:

First: Simulation:

When a mother prays in front of her daughter and the daughter imitates or imitates her mother, here the simulation is an experiment to learn to perform a set of skills and instill social and religious values, that is, the simulation must be with a specific goal and not random without any goal.

Among the goals that simulation programs achieve are increasing the realism of learners, increasing the motivation of learners, developing concepts, achieving Discovery Learning, Mastering skills such as problem-solving skills, and social interaction.

The two researchers define simulation as the educational method that the teacher sometimes uses to bring the learner closer to the real world by providing a learning environment similar to the real world, and that the simulation achieves a specific goal, as the learner through simulation can practice certain skills, which increases the possibility of practicing experimentation, and brings them closer to understanding the real world.

Examples of simulation programs are:

Circuit Wizard program : it is a simulation program for electronic and electrical circuits, providing a new and unique environment for learning electricity and electronics, as the learner can design electronic and electrical circuits on this program with ease and mastery, and these circuits designed on the Circuit Wizard program are similar to reality, where the learner can install them, connect tools and apply them as if they were real, and this program helps to apply the experiments and activities in the technological education book, especially the remote sensing and control unit.

This program is used to conduct experiments and activities that cannot be carried out in ordinary laboratories due to the lack of tools and materials due to their high cost or difficulty of implementation or due to distance learning or the possibility of failure of the experiment and not reaching the required results or malfunction of some parts, the Circuit Wizard program was a suitable alternative for conducting experiments and electronic and electrical activities.

Since the program has all the electronic elements such as : Batteries, resistors, integrated circuits, diodes, transistors, logic gates, sensors, output components, in addition to testing devices such as voltmeters, ammeters, signal tracers (Oscilloscope) and others, these tools and elements are either symbols or shapes close to reality, experiments and activities are carried out with high accuracy and mastery, and allow the learner to deal with them easily, gives the required results from the experiment or activity and achieves the goals that we seek to achieve from the experiment or activity, as the learner by dragging the items he wants to the workplace, and then connecting them to the connection panel, where the learner will be able to connect the wires with the mouse And then he clicks on run, and the circuit will start working directly, and then test it and detect errors with it.

As this program is characterized as free and can be downloaded from the following link:

<http://goo.gl/xCNBFB>

Second: Electronic concepts:

The two researchers know that concepts are terms that carry ideas related to facts, phenomena and processes, and consist of two parts (name and connotation).

As for electronic concepts, the two researchers define them as terms that carry ideas related to electronic facts, phenomena and processes contained in the remote sensing and control unit from the textbook of technological education for the basic eighth grade.

The two researchers believe that the process of learning concepts is very important, as concepts are one of the most important products of science that help organize scientific knowledge, and concepts are characterized by remaining constant and are less likely to change, as learning concepts helps students understand, assimilate, apply and interpret, it is a cumulative constructive process that leads to understanding and assimilation, and if students are understood and assimilated, this leads to the application of this understanding in new situations.

Third: Electronic practical skills:

The two researchers define skill as: the ability to accomplish a certain activity, a certain task or educational work efficiently, accurately, perfectly and with the shortest possible time and effort.

As for the electronic practical skills, the **two researchers** define it as a motor and cognitive ability through which the learner can plan, think, install electronic control circuits, find out the causes of their malfunction and try to fix them, taking into account the element of time, quality and material cost, measured by the degree obtained by the learner in the electronic practical skills test and the observation card of the electronic practical

performing skills in the remote sensing and control unit from the textbook of technological education for the basic eighth grade.

In this study, **the two researchers** used several tools or methods to measure the level of electronic practical skills by building an achievement test to measure the level of acquisition of scientific information for cognitive electronic practical skills. In addition, the two researchers built a note card to measure the performance electronic practical skills. These tools or methods were applied to the study sample and then they implemented the necessary statistics to obtain the results of the study.

Previous studies:

According to the knowledge of the two researchers, there is no study talking about the use of the Circuit Wizard simulation program, but there are previous studies that dealt with the impact of using computer and interactive simulation programs on student achievement and were as follows:

1. Shaltut Study (2017):

This study also aimed to find out the impact of using interactive simulations on the development of achievement in sixth grade primary students in the subject of science, where the problem was identified by answering the following question: To answer the question, the researchers followed the semi-experimental approach, where it was applied to a random sample of 20 female sixth-graders of the experimental group, and 20 female sixth-graders of the control group, where the study results of the research process showed that there are significant differences at the level of ($\alpha \leq 0.05$) between the average scores of female students of the experimental and control group in the level of remembering, understanding, Application, Analysis and synthesis.

2. The Ibrahim Study (2016):

This study aimed to find out the effectiveness of using interactive simulation games (x-box) to develop some mathematical skills for Primary School students, where the researchers used the descriptive curriculum and the semi-experimental curriculum in this study, the research sample consisted of (66) fifth grade students, the research tools were devices for playing simulation games (x-box) and electronic game CDs and the test of intelligence, the study found the presence of significant differences at the level of (0.05) between the average of the two tribal measurements and the dimension of the control group in football skills and for the benefit of telemetry.

3. The Al-Harbi Study (2015):

The purpose of this study was to reveal the effectiveness of the web-based simulation program in the development of skill performance among primary school students, where the descriptive curriculum and the semi-experimental curriculum were used and the study group consisted of a sample of sixth grade primary students and the study tools were represented as a measurement of thinking skills, a note card of the experimental group.

4. Al-Thaqafi studies (2013):

This study aimed to determine the image of a program based on the simulation of three-dimensional geometric shapes in the engineering subject for intermediate second-graders in terms of its technical and educational aspects, where the study complex consisted of (90) students from the intermediate second-graders, where the students were randomly divided into (45) students for the experimental group and (45) students for the control group, where the researchers used the experimental approach in the study, and the results of the study revealed a statistically significant difference at the level of (0.01) between the average grades of the students of the experimental group and the control group in the application to test the skills of innovative thinking in (fluency, flexibility, originality and detail)

5. The study of Al-Dahmash (2011):

This study aimed to investigate the impact of using an interactive computer program in teaching science subject on creative thinking in seventh grade students. The sample of the research consisted of (60) students, where the creative thinking test was prepared as a data collection tool. The results of the statistical analysis of the data indicated that there are significant differences in creative thinking as a whole between the control and experimental groups in favor of the experimental group, and this study also indicated that there are differences between the control and experimental groups in fluency, flexibility, innovation and problem solving in favor of the experimental group as well, and this indicates the effectiveness of the interactive simulation in the development of creative thinking skills Seventh-graders.

6. The study of Nasrallah (2010)

The purpose of this study was to build a computerized program based on the simulation method to develop skills in dealing with networks and study the effectiveness of this program, the researcher followed the descriptive analytical approach, the constructive approach and the experimental approach, the researcher used the Content

Analysis tool and the achievement test, the sample of the study consisted of two divisions of students of the study also found that there are significant differences between the pre-and post-application of the achievement test. Statistical significance between the average grades of the students of the group in the pre - application and the post-application of the observation card.

7. A study of Sentongo, J. et al (2013)

This study was conducted in Uganda under the supervision of the University of (Limpopo) in South Africa, and aimed to find out the impact of the use of computer simulations in addition to practical training activities in the traditional laboratory on the achievement of students and their attitudes towards science when studying the subject of chemical bonds, compared to the use of practical training activities in the traditional laboratory only, the researchers used the experimental method, the study sample consisted of (115) female students and students from the secondary level, the sample was divided into an experimental group that included (58) students, of whom (40) were male and (18) a control group included (57) students, including (36) males and (21) females, the study applied For a period of three weeks, several tools were used: a manual of practical activities for experiments on chemical bonds for their implementation in the traditional laboratory and in computer simulations, as well as one test of the pre-and post-application, consisting of 30 questions that included knowledge, understanding, application and analysis. An interview sheet was also used to find out the students' attitudes towards science and was applied to (20) of the students after performing the test in the remote application, and the results of the study were in favor of the experimental group in academic achievement, while the experimental group's attitudes were positive towards chemistry compared to the control group.

8. A study of Kaheru, s., Kriek, J. (2011)

This study was conducted in the province of Limpopo in South Africa and was supervised by the University of Venda (Venda) in South Africa. the aim of the study was to compare the effectiveness of using interactive computer simulations with the traditional teaching method (theoretical explanation with chalk) on short-term and long-term academic achievement, and the speed of solving physical problems as one of the skills of science operations, in the unit of light (engineering optics) of the eleventh grade course. The researchers used the semi-experimental method, and the study sample consisted of (104) students from 4 secondary schools who were selected by the intentional sample, provided that there is parity among them. In order to control some of the asymmetric factors in the four schools, such as the presence or absence of a computer-proficient teacher, the method of switching between experimental and control groups was used, two schools studied the first section of the unit using interactive computer simulations, while the other two schools studied the same section in the traditional way. in the second section of the unit, schools were switched between schools, so that the experimental schools become Control and the control schools become experimental. then the researchers prepared an achievement test for the concepts contained in the module and the test consisted of 26 items. they also prepared a note card to monitor the performance of the physical problem-solving skill. The researchers also used an interactive computer simulation program suitable for this module from PhET, a free website. The results of the experiment were in favor of using computer simulations in the two sections of the unit in terms of academic achievement of short-term and long-term physical concepts, as well as in the skill of solving physical problems.

9. The study of Chen, C.-H & Howard, B. (2010)

This study was conducted in the USA and aimed to find out the impact of live (direct) simulation on the learning of middle school students and their attitudes towards science, using technology to simulate scientific activities in the real world, and make scientific survey processes characteristic of students, and (311) female and male students participated in this study, including (186) males, (125) females from middle schools, and seven teachers from Virginia, Ohio, Pennsylvania and New York, the simulation experiment was conducted the atmosphere is a volcano in the pre-eruption stage, as a Category III hurricane approaches 'Students work in teams, one team records technological and volcanic data in order to predict what will happen to the volcano, another team follows the hurricane, a third team to evacuate the population, a fourth team to shelter, then collect data and send it via satellite, the study was designed by applying a pre-and post-application of a test of scientific knowledge consisting of (40) questions, as well as a questionnaire prepared in advance to find out the students attitudes towards science, the results were in favor of the post-application in scientific knowledge, the average grades of the students were greater than the average grades of the female students, and there was a positive change in the students in their attitudes towards science are greater than the change in female students.

10. The study of Omer, Petec&Likar (1992)

This study aimed to reveal the extent of the impact of computer simulation and problem solving on students' achievement in chemistry, as well as on scientific thinking skills and trends towards chemistry, for high school students, an experimental group was used in this experiment using the computer simulation method, and an experimental one using the problem solving method, and then a control group using the traditional method, the sample was composed of (200) ninth grade students, and 4 tools were used in this study represented by an achievement test in chemistry, a test of scientific thinking skills, then a test of trends, and finally a test of the

ability to think logically, the results indicated that the method Computer simulation and problem solving method gave high-value results in achievement and scientific thinking skills compared to the traditional method, and as for trends, the computer simulation method gave valuable results if compared to the traditional method or problem solving method.

Curriculum of the study:

The two researchers in this study followed according to the nature of the study on **the experimental approach**. The students of the experimental group were taught using the program (circuit Wizard), while the control group received the teaching of the module in the traditional way, where the study tools of the two Tests (pre-and post-tests) were applied to both groups.

The two researchers followed the experimental design based on two groups (experimental and control) as follows:

The control group :Pre-measurement → Normal teaching (the usual way)→ Dimensional measurement

Experimental group :Pre-measurement → Processing (using the Circuit Wizard program) → Dimensional measurement

The study community and its sample:

The study community consists of all basic eighth grade students in all schools in the North and central Hebron governorate of the Ministry of education and higher education.

The study sample included (24) a student from the eighth grade, the two researchers chose the Palestine basic school for girls intentionally because one of the researchers trained field training in this school, and this leads to easy communication and communication with the school.

The researchers selected the sample of students for the experimental and control group in a simple random way from among the students, so the study sample consisted of two divisions, one experimental and the other control.

The control group: It consisted of 12 students (pre-measured) → Normal teaching → Dimensional measurement .

Experimental group :It consisted of 12 students (pre-measured) → Processing → Dimensional measurement .

Table (1): distribution of study sample members

Female students	Experimental group	The control group	Totals
The number	12	12	24
The percentage	50%	50%	100%

Study tools:

To achieve the objectives of the study, the researchers selected two research tools, namely: the achievement test for concepts and practical electronic cognitive skills, the observation card for practical electronic performance skills.

The equivalence of study groups:

The two researchers have made sure that the study groups, the experimental group and the control group are equivalent in terms of:

1. Gender: all members of the two groups were selected from females.
2. Chronological age: all members of the study sample are between the ages of (14-13) years.
3. Achievement test of tribal electronic concepts and practical skills
4. Tribal note card.

Table (2)

The equivalence of the experimental and control groups in the achievement test and the observation card

Statement	Experimental group N=12		The control group N=12		Value t	Statistical function
	Arithmetic average	standard deviation	Arithmetic average	standard deviation		
Achievement test of tribal electronic concepts and practical skills	9.83	3.12	9.25	2.76	0.484	Non-functional
Tribal note card	7.42	2.71	7.25	2.83	0.147	Non-functional

The tabular value (t) at the level of 0.05 is equal to 0.633 and the degree of freedom (22)

It can be seen from Table (2) that the two groups are equivalent in the achievement test of concepts and practical skills of tribal electronic, and tribal note card.

Study variables:

Dependent variables: acquisition of electronic concepts and practical skills.

Independent variables: Circuit Wizard program.

Information collection and analysis:

The two researchers used the dimensional test to collect information on the extent of acquiring concepts and practical electronic cognitive skills, as well as the observation card was used to measure the extent of acquiring practical electronic performance skills, and then the researchers analyzed the results using the statistical analysis program (SPSS).

Results and analysis:

The two researchers have studied the following null hypotheses:

1. There are no significant differences at the level of ($\alpha \leq 0.05$) between the average scores of students of the experimental group and the average scores of students of the control group in the cognitive test of electronic concepts and practical skills.
2. There are no significant differences at the level of ($\alpha \leq 0.05$) between the average scores of the students of the experimental group and the average scores of the students of the control group in the observation card for electronic practical performing skills.

Results of the study:

The first null hypothesis:

1. There are no significant differences at the level of ($\alpha \leq 0.05$) between the average scores of students of the experimental group and the average scores of students of the control group in the cognitive test of electronic concepts and practical skills.

The results of the study showed the presence of significant differences in the average scores of female students in the cognitive test of concepts and electronic practical skills in favor of the experimental group, and this indicates the presence of an impact of the program of circuit Wizard on the achievement of students and their acquisition of concepts and electronic cognitive practical skills, as shown in Table (3), therefore, the null hypothesis is rejected and the alternative hypothesis is accepted, becoming as follows:

There are significant differences at the level of ($\alpha \leq 0.05$) between the average scores of students of the experimental group and the average scores of students of the control group in the test of electronic concepts and practical skills.

Table (3): the significance of the differences between the students of the experimental group and the students of the control group in the test of concepts and practical electronic skills.

The group	Number of people	Arithmetic average	Standard deviation	Value t	Semantic value	Statistical significance
Experimental group	12	25.5	3.5	3.591	0.002	Function at 0.05
The control group	12	19.17	5			

It is clear from the previous table that the average score of the experimental group in the test was 25.5 with a standard deviation of 3.5, and the average score of the control group was 19.17 with a standard deviation of 5, and the difference between them was 6.33 in favor of the experimental group. it is clear from this that there are significant differences at the level of ($\alpha \leq 0.05$) between the average scores of students of the experimental group and the average scores of students of the control group in the achievement test of electronic concepts and practical skills.

This indicates that the Circuit Wizard program has an effective impact on the development of concept acquisition in basic eighth grade students, as the simulation method, i.e. the use of the Circuit Wizard program, leads to an approximation of reality for students and thus makes it easier for students to understand concepts and absorb them well, and also allows students to familiarize themselves with different knowledge and acquire various practical skills through practice and continuous training, this is evidenced by comparing the answers of the students of the experimental group and the students of the control group in the achievement test of concepts, where they noticed that there is a big difference in favor of the experimental group, as it is shown in Table No 3.

The second null hypothesis:

2. There are no significant differences at the level of ($\alpha \leq 0.05$) between the average scores of the students of the experimental group and the average scores of the students of the control group in the observation card of the electronic practical performing skills.

The results of the study showed the presence of significant differences in the average grades of female students in the observation card for electronic practical skills in favor of the experimental group, and this indicates the influence of The Wizard Circuit program on the average grades of female students in the observation card for electronic practical skills, as shown in Table (4), therefore, the null hypothesis is rejected and the alternative hypothesis is accepted, becoming as follows:

There is a statistically significant difference at the level of ($\alpha \leq 0.05$) between the average grades of the students of the experimental group and the average grades of the students of the control group in the observation card for practical electronic performing skills.

Table (4): the significance of the differences between the students of the experimental group and the students of the control group in the observation card for practical electronic performing skills

The group	Number of people	Arithmetic average	Standard deviation	Value t	Semantic value	Statistical significance
Experimental group	12	23.08	4.295	5.984	0.000	Function at 0.05
The control group	12	13.75	3.279			

It is clear from the previous table that the average score of the experimental group in the test was 23.08 with a standard deviation of 4.295, and the average score of the control group was 13.75 with a standard deviation of 3.279, and the difference between them was 9.33 in favor of the experimental group. It is clear from this that there are significant differences at the level of ($\alpha \geq 0.05$) between the average scores of students of the experimental group and the average scores of students of the control group in the observation card for practical electronic performance skills.

This indicates that the Circuit Wizard program has an effective impact on the development of the acquisition of practical electronic performance skills among students of the basic eighth grade, as the use of the Circuit Wizard program leads to an approximation of reality for students and thus makes it easier for students to imagine how to install electrical and electronic circuits, as students practice activities and apply experiments in the note card for practical skills. They noted that there was a significant difference in favor of the experimental group as shown in Table No 4.

The size of the effect (η^2) was also calculated, where he was the size of the effect of teaching using the Circuit Wizard program was large.

Recommendations:

- The need to focus on the practical and performing skills contained in the curriculum of technological education and observe their implementation by students.
- Training teachers of technological education on the use of simulation programs in the teaching process.
- Providing good computer laboratories, increasing the number of computers and their efficiency in each laboratory, providing each student with the opportunity to deal with educational programs, especially simulation programs himself, which improves the educational level.
- Holding training courses for technology teachers and educational supervisors to train on the use of these programs in the implementation of practical activities contained in the technological education courses, especially at the basic stage.
- It is the duty of parents to provide electronic devices and the internet to their students that are required for use in distance learning (e-learning) and learning using simulation programs.

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