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Developing a Virtual Laboratory for Some Chemical Experiments on the Portable Application To Develop Laboratay Skills For Secondary Stage Students.

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Introduction

The world is witnessing an accelerated set of changes and developments in all fields particularly in the field of information and communication technology that causes us to respond to these developments and adapt and harnessed to serve individuals and institutions. Where nations are racing to develop their societies and no matter how different racing styles, they all meet in the direction toward the applied science so shouts are raised loud here and there to reconsider the educational process content, objectives, and means, to allow students in all levels of education to make the most of modern technological means in school performance and acquired a knowledge and skills consistent with the nature of the times in which we live and the rapid development of information and communication technologies and their applications do not provide information only new opportunities but also a trend toward what is called highway for economic, social and educational-related and archeology information and the information age began fast start, and this contemporary technology already brought fundamental changes in learning systems and the use of computers and information and communications technology in teaching and learning processes and enormous developments represent a fundamental change in producing educational programs where possible production of interactive software based on multiple high-quality tools (Mohammad Abdel Wahab 2007.167).

Among the most important changes that have occurred in the field of education in this information age is a shift from teacher-centered education at Teacher-Centered Education to learner-centered education on the Learner-Centered Education. The emergence of e-Learning has facilitated widespread reliance on education centered on the learner and other changes in educational practices (B. C. Lee, J. Yoon and I. Lee, 2009)

Future technology is interested in virtual reality interactive technology, a way to transfer the corresponding vehicle that is generated and displayed on the computer it is possible to move them across the internet holograms, and then the user feel it inside

And Virtual Reality is built on the assumption that the most effective education is experimental learning or building on the actual value of the content of which is similar to the application of learning in fact, It is known as one of the technological innovations that use the computer as well as some hardware and software, integrated as a system to create three dimensions imaginative environment, the individual was able to communicate and interact with them through the senses and some other tools, so that the individual feels that he is able to communicate ,interact and deal with the real situation in all its dimensions, and the degree of realism and immersion and interaction offered by

Virtual reality to the individual vary according to Virtual reality itself (Ahmed Kamel, 2002.5)

The technology of virtual reality comes as a product for the progress of many other technologies, as they are points of convergence of three technologies, namely, (communication systems, three - dimensional, modern media). Modes and methods of virtual reality are characterized in three basic recipes (interactive, cooperation, experience), where interaction is concerned with the possibility of user to choose information to participate in a scenario addressed to eventually reach a production of the information itself, and interactive interaction is not only concerned with the center of education with educational mediator or different components, but also with other individuals representing cooperation and communication, while dealing with the experience of the individual practice of the learning process. (Khaled Mahmoud Nofal 2010.18-19)

The default labs Virtual Labs is cosidedred as one of virtual reality applications, virtual laboratories is an open environment from which to simulate a real science lab and link the practical side with theoretical one , and through which thinking skills are taught , and students have a free hand to make decisions for themselves without any negative effects. (Woodfield, et al, 2004)

Virtual labs are featured with many features and characteristics (such as presence, sailing, vision points, interactivity, simulation, expertise in artificial environment, education cooperation). (Najwan Hamid, 2007)

Presence; means a user presence as part of the simulation system, where he is absorbed in it and this would give him the feeling already his presence in the real place of experience, student can break in his environment with specific information where he can touch it and see it and listen to it in this artificial world, where the high degree of presence, the sense of immersion be very strong to the point that users hold their perceptions and impressions of its interaction with the evidence. This feature reflects the feeling that the user cannot tell the difference between them and the experience of truth and disappears with the .participation of tool in the sense of the situation

Sailing; provide virtualization for learners and users of opportunities to observe and travel in the virtual environment, without moving from their places also gives them a sense that they are moving and walking around all over the place inside these environments in different means and ways, and that students start .exercising through verbal commands

Vision point; it reflects a user's ability to change the point or the angle at which he sees the environment and move his eyes in the environment

Interaction; (user interaction with the environment) it means individual's ability to use numerous ways to interact and handle and adapt to the digital simulation and move virtual materials and objects with eye , hands or sound on the virtual environment establishment adjust environments, and it is consistent with the user's input

Simulation experience in the artificial environment; such as experience is replicated exactly where the truth requires that individuals make decisions and solve problems and deal with the various sites in the light of the facts and circumstances presented by this artificial environment Cooperative education; that collective work environments and distributed environments aimed to make a collective posts, and offer to many users the possibility to participate through a virtual space at the same time, on this, the real-time interaction between the various students spend to cooperative learning.

Discovery learning; thinking is a process requiring individual reorganization of information stored is adapted to enable him to see the new relationships that were not known to him before.

and learning can be defined as learning that occurs as a result of information processing, and installing and turn ing it until it reaches the new information which enables the student to guess or configure the imposition or find the truth by using induction processes or deduction, or by using the viewing and updating or any other way,it is considered one of the ways to help students to explore ideas and solutions on their own, and that they generate a sense of satisfaction and the desire to continue learning, and makes them discover new ideas themselves (Mohamed Abdel Wahab, 2007.50).

And default labs are used in many fields such as medicine, engineering and architecture, training and education, and due to its high capabilities in the field of teaching, especially in the materials and courses that are difficult to represent in fact, such as chemistry, the use of this technique is of great importance to face the massive evolution in teaching methods and multi-media, and here we need to try to employ the technology of virtual reality and use them in solving various problems facing the education process. And it can be classified into two types, first simultaneous virtual lab, and the second asynchronous.

Virtual lab

simultaneous Virtual lab; this kind of e-learning is interested in the exchange of lessons and topics, research and discussions between the teacher and learners at the same time and directly, through conversation and virtual classroom programs, and the advantages of this type of e-learning for the learner is the immediate feedback and communicate directly with the teacher to clarify any information, and the most important impediments to the use of this type is need

for modern equipment and good network communications, so simultaneous e-learning is one of the most sophisticated types of e-learning (Mohamed Hafiz Adnan Sharif, 2010)

The demonstration of chemical experiments in traditional laboratories in secondary schools alone is not enough to give the students the skills necessary to conduct experiments where students are not able to increase their number to watch and follow-up skills necessary to conduct the experiment - The teacher will divide the students into small groups, and performs a demonstration for each group separately and repeat it with the rest of the groups, leading to more consumption of hours of training, in addition to the low efficiency of the experiment tools and materials to operate. The researcher concludes from the foregoing that it must take advantage of the technology of virtual reality in default lab design in order to improve the teaching of chemical experiments in secondary education, and also to detect the relative effectiveness of this technology to conduct chemistry experiments process, hence the need for this research to be a building block in this developmental framework, and the researcher will show a at the next part of the research problem.

Research problem

Practical experience represents a vital part of the educational process, but that the economic aspects and limitations of space and time represent obstacles to the establishment of scientific laboratories in most educational institutions. And those can solve the problem through the adoption of virtual reality technology, which allows the construction of virtual labs that can simulate the processes and events that occur in real laboratories, in addition to supporting virtual labs to communicate and interact with others they are sometimes higher than the actual laboratories in some aspects

Virtual laboratory is a technology innovations in the field of education and the extension of the electronic systems simulation, which simulates a virtual laboratory to large scale real laboratory in functions and events fairly, and from which to obtain results similar to the results of a real laboratory

the research problem is then determined in the lack of educational institutions for the existence and reality coefficient default experiments chemistry at the secondary level on mobile devices, and therefore the problem can be formulated in the next major question: How is the development of Default factory for some chemical tests on mobile devices for the development of laboratory skills of high school students?

Research questions

Branched from the main question to search the following sub-questions:
1-.What are the main trends in modern virtual reality software ؟.

2-What should be available for the production of virtual reality educational .
software on portable devices skills?

What are the chemical laboratory experiments that need skills development? .

What are the steps proposed of educational model for design to build a virtual .
lab?

5-What perception proposed to develop a virtual laboratory for the .
development of the proposed laboratory skills of experiments to the secondary
stage?

What is the effectiveness of the proposed virtual laboratory for the .
development of laboratory skills of chemistry experiments to the secondary
stage?

Research goals

The goal of current research to

.Identify the most important recent trends in the virtual reality software .

Determine skills available for the production of virtual reality educational .
software on portable devices

Identify the chemical experiments in secondary stage that need laboratory ..
.skills development

Provide a model of instructional design for virtual reality educational software .
.on mobile devices

Develop Default factory for some chemical testing for the development of .
laboratory skills for secondary school students on mobile devices

Recognize the effectiveness of the proposed virtual laboratory in the .
development of laboratory skills for chemical tests among secondary school
.students

Research importance

The importance of current research is represented that may contribute to:

1-overcome some of the problems of education of increasing the interest in
education, and increase the number of students.

Employing virtual reality programs extensively within the educational
2-.process

3-Supply those who produce virtual reality software with production bases of
virtual reality software on mobile devices

4-Help those who teach chemistry in high school to explain and apply the
chemical experiments.

5-Draw the attention of educator's officials to the importance of the introduction
of virtual reality technology in the educational process.

6-Draw the attention of researchers in the field of education to the importance of
virtual reality labs as an area of research.

Search Terms

1- Virtual reality .

Virtual Reality is defined as "education is done through an integrated system based on a computer, from which to create a minimized world of education similar to or identical virtual reality." (Magdy Salah 2008.19).

It can be defined as "three-dimensional environments, that simulate the reality of what material, and provides the learner with real experience where the user is interacting to the maximum degree possible using a set of tools and techniques for." (Khaled Mahmoud Nofal 2010.50).

2-The default lab

Virtual laboratory is known as a " virtual learning environment and aimed at developing laboratory work skills of the students." (Hassan olive 2005.65).

And it can be defined as "Virtual Electronic learning environments through which labs and real science are simulated, by applying the laboratory experiments by default simulation to real application, and be available for use through various media or through the Internet." (Ahmed bin Saleh, 2009.3)

Laboratory skills to the experiences of Chemistry

Educational lexicon defines skill as a "speed and accuracy in the performance of a work with economy of effort and time spent, and this work is simple or compound".

(The Concise Dictionary of Education, 1982, 207)

Defined by current research procedurally as "a set of capabilities if available to the individual, he can perform chemical experiments of chemistry at the high school with the availability of much of the speed and precision and perfection, which leads to economy of time, effort and cost".

Portable devices .

Mobile devices are known as "a phone, tablet relatively large for regular phones and has a personal computer, and works on an operating systems such as Windows Phone, Symbian, Linux, Blackberry, and Android, and you can run the software, games and run the Internet and send and receive e-mail messages. (Ross J. Anderson, 2011, 4).

Research hypotheses

1-There were no statistically significant differences between the averages of the experimental group students and the main scores of the control group in the tribal measurement for the development of laboratory skills to the experiments of chemistry in high school.

2-There are significant differences between the scores of the experimental group students and the scores of the control group students in telemetric measurements

for the development of laboratory skills to the experiments of chemistry at the high school for the experimental group.

Research Methodology

There are two approaches followed:

Descriptive approach

Descriptive approach is used to address theoretical framework to search through description, interpretation and analysis of the concepts of e-learning and virtual reality and the principles of design of virtual education systems on mobile devices as well as the development of clinical skills to the experiments of chemistry in high school.

2- Experimental approach .

The experimental approach is used to the design and production of proposal Default lab, and measure its effectiveness in laboratory skills for chemistry experiments on a sample of high school students school in Imam Nasif secondary school for girls, in Zarka, Damietta governorate.

Research variables

Independent variable: the proposal default lab

2-The dependent variables: laboratory skills for chemistry experiments to be developed in secondary stage.

Search limits

1-Spatial limits: This research was limited in its implementation on Imam Nassif Secondary School for Girls, the city of Zarqa, Damietta.

2-Human limits: This research was limited in its implementation on a group of students from Imam Nasif Secondary School for Girls, in Zarka, Damietta Governorate.

Temporal limitsl: This research was limited in its implementation on the period from September 2014 until......

Experimental design of research

In light of the nature of this research experimental design was selected and known as the "tribal posttest design using two unequal; one experimental and the other control

Table (1-1) experimental design research

Study groups	Pre measurement	the dependent variable	Post measurement
the control group	Provide educational content for chemistry experiments in the traditional manner. Electronic test application		The application of electronic test.

Provide educational content for chemistry   The application of electronic test. experiments by proposed default lab enriched by the content and media Experimental group   electronic test application

The research sample

The study sample (consists of 60) students of secondary school students, the Imam Nasif Secondary School For Girls, in Zarka, Damietta Governorate, as follows:

Experimental group: (30) students .

2-.Control group: (30) students .

Search tools

1-Pretest to measure the dimensions of laboratory skills for chemistry experiments to the research sample (prepared by the researcher)

2-Proposed default lab for the development of skills of laboratory chemistry experiments (prepared by the researcher)

Search procedures

The researcher followed in the current research of the following

First, the theoretical framework includes

1- Collection and examination of the literature, Arab and foreign studies related to the theoretical framework for the study

2- Identify the e-learning techniques, and virtual reality, as well as laboratory skills for chemistry experiments in high school

Second: Applied framework includes

.1- The identification of overall objective of the proposed virtual laboratory

2- Prepare a list of procedural and general educational goals to be achieved during the course study and judge it to assess its validity and its relation to the .content

3- Prepare a list of concepts and laboratory skills for chemistry experiments in high school requiring development.

Building search tools

1-Preparing a test to measure the concepts and skills of the laboratory .experiments of chemistry at the high school

2- Use programming and virtual reality techniques to build a virtual laboratory for the development of laboratory skills of chemistry experiments in high .school

.3-View default lab proposed on experts and arbitrators

4- Modify the default lab proposed according to the views of experts and .arbitrators

5- Display pretest and posttest on experts and arbitrators.

6- Modify pretest and posttest according to the opinions of experts and arbitrators.

7- Choose the research sample, a random sample of 60 students and divided into two groups, one control of 30 students and the other experimental of 30 students to apply the default lab proposed on them.

Third: the experiment

1-Selecting a random sample of prospective students of 10 students for the implementation of the proposed default lab on them.

2- Conduct exploratory experiment to measure the reliability and validity of the study and learn about the problems faced by the researcher during the application.

3- Posttest application on the experimental and control groups to ensure the homogeneity of the sample.

4- Default lab proposed application of the experimental group.

5- Posttest applied to the experimental and control groups.

6- Recording and monitoring grades and processed statistically

7- Discussion and Analysis and interpretation of the results.

8- Make recommendations and proposals.

previous studies

Study (Mona Hadi Saleh, 2013)

Entitled: "Study the possibility of applying a virtual learning environment in educational institutions".

The study targeted follows:

1-Addressed to the educational process concept Bmdechladtha and multiple outputs, and how to get out of the crisis of education in all its institutions through the use of virtual learning and viability of this new type of education can build virtual classes and virtual environment.

2-As has been the study of all the specifications that environment and the possibility of its application in educational institutions.

The results of the study are summarized as follows:

1-The use of virtual labs in educational institutions redress the lack of practical possibilities because it does not provide adequate funding.

2-The possibility of conducting practical experiments in virtual Almokhtbarat which are difficult to implement in the laboratory because of the truth gravity learner experiences such as nuclear energy or bio-chemistry or biology, among others.

3-laboratories Aafteradih design you need in the design and production of a team of programmers and specialize Madsin and curriculum experts and subject matter experts and psychologists.

4-attention to the establishment of training courses for university students Almahd to enable them to master the technology research and Information with Li available online

5-inking universities and higher education institutions together in a network of information, which provides planners university education policy and decision makers, executives and officials, professors, researchers, information crisis for the success of their business and management.

Study (Ahmed Bin Abdul Aziz Al Mubarak, 2013) .

Entitled: "The impact of teaching using virtual classroom via the World" online "on the collection of the Faculty of Education students in learning techniques and communications at King Saud University Network"

The study targeted follows:

1-The use of virtual classrooms to overcome some educational problems such as solving the students who were in danger of leaving school problems, or some segments of society who are older than college age.

2-detect new ways of learning of the educational process by focusing on the learner through the application of modern educational theories.

3-Know the impact of teaching using virtual classroom via the World Wide Web for information on the collection of university students, and take advantage of them in the teaching and learning processes.

The results of the study are summarized as follows:

1-There is no difference statistically significant at the level of (0.05) in the average student achievement in the decision of 241 Lucille between the experimental group and the control group at the first level of knowledge of Bloom's Taxonomy (remembering level)

2-no difference statistically significant at the level of (0.05) in the average student achievement in the decision of 241 Lucille between the experimental group and the control group at the second level of knowledge of Bloom's Taxonomy (level of understanding)

3-There is a difference is statistically significant at the level of (0.05) in the average student achievement in the decision of 241 Lucille between the experimental group and the control group at the third level of knowledge of Bloom's Taxonomy (application) level.

4-no difference statistically significant at the level of (0.05) in the average student achievement in the decision of 241 Lucille between the experimental group and the control group in the overall achievement test.

Study (Magdi Said Akl 0.2013).

Entitled: "The effectiveness of the three-dimensional software development skills in the use of display devices with the students of the Faculty of Education".

The study targeted follows:

1-List building e-courses designed three-dimensional standards necessary for the development of students' skills in the use of display devices.

2-List building necessary for the students of the Faculty of Education at the use of projectors skills.

3-Build a three-dimensional program to develop the use of projectors skills of students in the Faculty of Education at the Islamic University.

4-help the current school teachers in the use of educational projectors study-

The results of the study are summarized as follows:

3-Designing e-learning environments to the three-dimensional programs work

2-The need to provide training for actual and direct some monitors that require multiple skills when in use.

3-The increased interest in models of good educational program design three-dimensional

4-There is a statistically significant difference at the level (0.05) between the average scores of the experimental group and control group in the note card to the performance of students when dealing with the OHP.

5-There is a statistically significant difference at the level (0.05) between the average scores of the experimental group and control group in the note card to the performance of students when dealing with the interactive board.

6-achieve a three-dimensional program effectiveness rate of gain Black (> 1) in the collection, performance of students.

Study (Mahmoud Abdel-Salam and Ahmed Mohammed essence 0.2012)
Entitled: "Virtual Laboratory experiments of physics and chemistry and its impact on the development of the power of observation of middle school students and their achievement of knowledge"

The study targeted follows:

1-identify the impact of the use of the Virtual Laboratory experiments of physics and chemistry in the collection of the first-graders average.

2-disclose the impact of the use of virtual laboratory for experiments in physics, chemistry observation force the development of the first-graders average.

3-There are significant differences between the two sets of search in the performance of its members on Althsama test in chemistry.

Tugod 2. No statistically significant differences between the two sets of search in the performance of its members on Althsama test in physics.

3-D. No statistically significant differences in the performance of the two students is a difference between the post application and tribal application to test the power of observation.

4-take advantage of the virtual laboratory technology to overcome the problems and obstacles faced by the teachers, especially in some of the experiences that students not any prior experience or experiences that involve some risk.

Study (Louay harmful descriptor 0.2012) .

Entitled: "Virtual reality and the possibility of its application in the Palestinian Built Environment - A Case Study solve the problem navigating through the drawers in the city of Nablus".

The study aimed follows:

Identify the concept and the possibilities of virtual reality technology .

2-Identify the computer applications and virtual reality techniques in the field of architecture and urbanism

virtual reality in the Palestinian Urban Environmental Technology Application .

4-measurement of virtual reality in reducing the perception of projects in the urban environment gap system capacity.

The main results of the study that the use of virtual reality system that would radically change a positive happens in the process of asking the various construction projects is possible from Khalalha design and development of the proposed projects the largest number of specialists involvement of different disciplines is an engineering, Kmt_khassn in sociology, investors and the public and users

This study concluded that the use of virtual learning labs meet the requirements and that the virtual laboratory environments means updates the learning materials and invent new ways to teach and this will reflect the latest achievements in the field of education.

Researcher from previous studies has benefited the following:

• Theoretical framework on the subject of current research setting.

• Identify the tools used in these studies and take advantage of them.

• Identify some of the statistical methods and take advantage of them.

Research hypotheses

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2-There are statistically significant differences between the mean scores of the experimental group students and the mean scores of the control group students

in post measurement for the development of laboratory skills to the experiments of chemistry at the high school for the experimental group.

3-There were statistically significant differences between the mean scores of the experimental group students in the two measurements prior and subsequent to the development of laboratory skills of the experiments of chemistry at the secondary level for the benefit of subsequent measurement.

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