

The effect of the content presentation style (improvement by Cues) in the Augmented Book “E-lesson production skills for Instructional technology students”

Preparation

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أثر نمط عرض المحتوى (التحسين بالتلميحات) في الكتاب المعزز في تنمية مهارات إنتاج درس الكترونى لدى طلاب تكنولوجيا التعليم

The effect of the content presentation style (improvement by Cues) in the Augmented Book “E-lesson production skills for Instructional technology students”

Abstract: The goal of the current research is to develop the skills of producing the electronic lesson using the content presentation style (the improvement by Cues) through the augmented book. The research followed the developmental approach and the one-group experimental design for a sample of (30) male and female third-year students in the Educational Technology Division at the College of Specific Education, University of Minya in the academic year 2022/2023, and the measurement tools were: the achievement test for the cognitive aspect, and a product evaluation card for the performance aspect of the skills of producing the electronic lesson through the augmented book. The results showed that there was a difference between the pre- and post-application of the research group in the cognitive test in favor of the post-application, which means that their level of knowledge improved after implementing the research experiment, and the group’s performance improved and excelled in the post-application of the product evaluation card. The research concluded with a set of recommendations for interest in using augmented reality technology for undergraduate students. In various educational subjects, attention is paid to the skills of producing electronic lessons mentioned in this research and working with learners in the Educational Technology Department.

Keywords: (the improvement by Cues - Augmented book – E-lesson)

Research Introduction

The rapid development in the field of e-learning has led to the emergence of new methods and methods for indirect education, which depend on employing technological innovations to achieve the required learning. Through e-learning, learning can be provided through a combination of written and spoken language, in addition to fixed and animated visual elements, and various audio-visual effects and backgrounds. It makes learning more effective and useful.

Augmented books have become one of the most widespread and successful applications of augmented reality in the field of education. They are books that provide students with two- and three-dimensional digital displays and interactive learning experiences through augmented reality technology. Paper books are enhanced with the help of technological devices such as smartphones and special glasses, and contain elements From augmented reality, when the camera is pointed at it, the elements interact with the real environment (Zhang, 2015, 115).

Sarah Al-Otaibi (2016, 77) explained that augmented books are beginning to take their place in education. When you look at one of the augmented books, it looks like any other book, but when it is placed in front of the camera on a computer, the 3D elements, movies, and pictures and sounds appear, they include interactive elements and some applications that require the user to download the program so that the code embedded in the book can be read.

Many studies have emphasized the importance of using augmented books, their effective impact, and their integration into the educational process, including the study of Modha Al-Mutairi (2016), which showed the effective role in maintaining the learning effect. This result has been confirmed by the studies of Ibanez et al., 2014) ((Lim, Park, & Jordan, 2011), and the Fourteenth Scientific Conference of the Egyptian Society for

Educational Technology (2014) recommended the necessity of relying on modern developments and developments, including augmented reality technology and its design variables.

Many studies have dealt with the different types of hints in supporting the educational content presented with visual presentations, and their results differed in favor of the preference of any of the types presented, including the study of Nermin Muhammad and Hoda Mubarak (2017), which supported the introduction of augmented reality in acquiring the cognitive aspects of designing websites using computers, and the study confirmed Bleeker (2013) emphasized the necessity of providing textual hints in an augmented reality environment to parties in the communication process during learning, which helped increase achievement and skill performance, and Mien (2005) studied which aimed to test the audible text as a hint, and the visual text as a hint on cognitive load and academic achievement, and its results indicated that there was no Differences between the two groups: auditory text versus visual text as a cues.

Electronic lessons are an effective way to make educational content more dynamic and effective, and the multiplicity of media included in electronic lessons gives the ability to go beyond the limits of text as one of the elements through which content can be presented via computer screens, but there are some obstacles that limit the expansion of the spread and use of these. Media, including the need for teachers responsible for their production to master the programs designated for their design and mastery - especially - in light of the multiplicity and diversity of programs used in that (Nabil Gad, 2014, 369). Modern teaching methods also constitute a major factor in developing the teacher's teaching and professional performance, as these methods depend on advanced electronic teaching based on the computer and the Internet, which helps the teacher to perform his work and improve his teaching method in theory and practice. Which helps students

achieve educational goals effectively (Saad Abdul Karim, 2010, 145).

Research problem:

The research problem crystallized in the presence of a deficiency in producing an electronic lesson for educational technology students and their lack of knowledge of its production skills. Therefore, it created the need to reveal the effect of providing some cues (audio/visual) through the augmented book in light of the usual method that does not achieve the desired goal.

Research questions

From what was previously presented, the research problem was identified in: the inadequacy of the level of skills in producing e-lessons for Instructional technology students. The main research question can be crystallized in the following question: What is the effect of the style of presenting content by the improvement by Cues on developing the skills of producing an electronic lesson among educational technology students?

The following sub-questions branch out from the main question:

1. What are the skills for producing e- lessons using the Adobe Captivate program, with its cognitive and performance aspects?
2. What is the most appropriate instructional design for a book enhanced with content presentation style and enhanced with tips?
3. What is the effect of the content presentation pattern by the improvement by Cues on developing the skills of producing an e-lesson among Instructional technology students?.

Research objectives:

- The current research aims to address the deficiency in e-lesson production skills by using the content presentation style, improving with hints, among educational technology students.

Research importance:

The importance of the research can be determined as follows:

First: The theoretical importance, which includes the following:

□ Preparing content for e- lesson production skills.

- The results of this research are useful in providing opportunities to develop the skills of producing electronic lessons among Instructional technology students.

Second: Practical importance, which includes the following:

□ overcoming the weakness of e- lesson production skills by using the method of presenting infographic content. This study may provide the necessary environment to create creative and productive individuals, as society is currently in dire need of these groups that help develop and advance.

□ Assisting researchers in conducting further research and studies on e-lesson production skills

Research Limitation:

The current research adhered to the following limits:

1- Human Frontiers: Third year students - Educational Technology Division, Faculty of Specific Education, Minia University.

2- Content limitations: he skills of producing electronic lessons among educational technology students are:

- Open the program
- The skill of preparing lesson folders.
- The skill of recording a lecture.
- The skill of preparing an address.
- The skill of memorizing the lesson.
- The skill of closing the lesson.
- The skill of reviewing the lesson.

2- Time limits: The research experiment was conducted in the second semester of the academic year 2022-2023

3- Spatial boundaries: The research is applied in the computer laboratories of the Department of Educational Technology, Faculty of Specific Education, Minya University.

The search methodology:

The researcher used two research methods:

a. Descriptive analytical method; This is because it aims to collect, classify, analyze, and interpret data by reviewing previous literature and studies.

B. Experimental approach; This is because it suits the nature of research in the human sciences, in order to study the effect of variables: the method of presenting the content, the improvement by Cues (independent variable), and the skills of producing electronic lessons (dependent variable) among the study sample; This is done through a pre-measurement of the research tools, while integrating the study sample students into the learning process through a book augmented between the two applications, and then a post-measurement.

Research variables

The independent variable is the method of presenting content by improving it with cues (audio-visual), and the dependent variable is the skills of producing e-lessons.

Experimental research design

To measure the effect of the method of presenting content by improving it with hints, the current research used a one-group experimental design that relies on applying the measurement tools beforehand, then conducting the experimental treatment, and then applying the measurement tools afterward.

Experimental treatment material

The students in the research sample studied the augmented book prepared by the researcher, through which he presents the skills of producing electronic lessons.

Research tools:

The researcher used the following research tools:

- A cognitive test for the skills of producing electronic lessons
- Evaluation card for producing the electronic lesson

Research hypotheses:

- There is a statistically significant difference at the level of (0.01) between the average scores of the research sample students in the pre- and post-applications of the achievement test for electronic lesson production skills among educational technology students in favor of the post-application.
- There is a statistically significant difference at the level of (0.01) between the average scores of the research sample students in the pre- and post-applications of an electronic lesson evaluation card for educational technology students in favor of the post-application.

Research procedures:

- 1- Preparing the theoretical framework by reviewing the Arabic and English literature and studies related to the variables of the current research to benefit from them in the research stages.
- 2- Content analysis of electronic lesson production skills.
- 3- Preparing the experimental treatment material, which is an enhanced book for the content of electronic lesson production skills.
- 4- Preparing measurement tools and presenting them to the arbitrators, including
 - A test of electronic lesson production skills
 - Evaluation card for producing electronic lessons (prepared by the researcher)
- 5- Conducting an exploratory experiment to calculate the validity and reliability of the tools, and knowing the difficulties of application and ways to solve them in preparation for actual application.
- 6- Selection of students for the research group, which consisted of third-year students from the Faculty of Specific Education, Department of Educational Technology.

7- Applying measurement tools as a pre-application for the students of the research group.

8- Applying the experimental treatment material.

9-Monitoring data and processing it statistically, testing the validity of hypotheses, arriving at results, and discussing them in light of related studies.

10- Providing appropriate recommendations and proposals in light of the research results.

Research terms

Search terms can be defined as follows:

1. Augmented Book:

A combination of a paper book and mobile phone technology, and it aims to employ multimedia as augmented digital content. The learner can browse the augmented book by pointing the mobile phone camera at the barcode to browse the digital content.” Which could be 2D or 3D animation or video.” Kobkiat Saraubon (2016),

2-Operational definition

it is: “a paper book enhanced with three-dimensional objects, video or audio that are generated by computer graphics, and learners can, by pointing the mobile phone camera at the codes on the pages of the books, to see the graphics and images.”

2. Cues:

defines them as techniques and methods for recalling knowledge to the student, activating their expectations about what they will study, and developing a mental vision with which the student will carry out the learning process and invest it in a way that helps activate learning. Nahla Sharaf El-Din (2015)

4- Operational definition:

as: “audio textual or visual text stimuli with the aim of focusing learners’ attention on the educational content, which is the original stimulus presented in the multimedia video file explaining the

content and presented in the augmented book, to help learners develop the concepts and cognitive aspects associated with it.”

5- E- lesson production skills:

defines them as: “a means of achieving behavioral, teaching and learning goals. The design of electronic lessons goes through many stages, including: the analysis stage, the construction stage, and the design meaning the preparation and construction of the material and the preparation and construction of the page stage.”

Review and finally development. Hassan Diab (2007, 15)

6- Operational definition: as: “educational materials that are designed and programmed by computers in a coherent and sequential manner according to sound educational foundations, with the aim of transferring knowledge, concepts and skills to the learner in a simple and attractive way to achieve learning objectives.”

The theoretical framework for research and related studies

• The first axis: the augmented book

Augmented reality technology is one of the most important means to help students visually perceive information. Augmented reality is a type of virtual reality that seeks to replicate the real environment in the computer and provide it with virtual data that was not part of it. In other words, the augmented reality system generates a composite display for the user that blends the real scene that he is looking at. The user and a computer-generated virtual scene that augments the real scene with additional information.

With the rapid development of augmented reality technology, the book became known as augmented reality books and their integration into the educational process. The study (Mckenzie & Darnell, 2003) indicated the importance of using augmented books in developing various skills among students and that they help achieve cooperation between students, increase students' motivation, develop academic achievement, and achieve

Interaction between the learner and the surrounding environment also plays a role in breathing life into old books and e- books.

Definition of the augmented book:

Augmented books are among the most widespread and successful applications of augmented reality in the field of education. They are books that provide students with two- and three-dimensional digital displays and interactive learning experiences through augmented reality technology.

Zhang (115) believes that the emergence of augmented books has introduced many factors and variables that may affect the use and benefit of these books.

Both (Gudinavicius & Markeleviciute, 2020, 44) agreed; Muhammad Khamis (161, 2020); Gudinavicius & Markeleviciute, 2020, 44) on the concept of the **Augmented book** as:

- A technology through which physical paper books are combined with three-dimensional objects, video, audio, and multimedia elements that are computer-generated and employed by augmented reality technology. (Gudinavicius & Markeleviciute, 2020, 44))
- A traditional interactive paper book, which allows the learner to view and interact with the virtual content associated with it, which includes 3D objects and sound, where the learner can browse the paper book and watch virtual presentations. (Mohamed Khamis 161, 2020)

Features of the augmented book

There are many educational advantages to enriched books, specifically pointed out by Sarah Al-Otaibi (2016, 73): (Radu, 2012); Yuen (2011)) is:

Learning systems and environments based on augmented reality have helped students develop their cognitive skills and experiences. This technology is distinguished from other advanced electronic learning environments in that it is

more attractive to students in addition to being a more effective tool in the educational process.

- Real results are given if the learner makes mistakes during skills formation.

The second axis: improvement with cues

Hints play a major role in displaying visual content and making it more exciting, which attracts the learner's attention and awareness. When presented to him, it is used to clarify ideas and try to return abstract ideas to concrete ones. Because students need multiple learning stimuli, in which they use their senses to complete their experience. (Rajaa Abdel Aleem, 291, 2019)

Cues are an important factor in design, because they are a method that facilitates learning and obtaining effective education. Hints are not required to provide students with additional information, but rather they are used to focus on the educational stimuli that the student must realize. Hints reduce the time required for the learning process, as they are signals and connotations that are considered in and of themselves, stimuli that direct attention and perception. (Iman Saladin, 4, 2013).

It is one of the virtual secondary stimuli that can be used to support multimedia educational presentations. Many literature indicates that learning based on hints is more effective than learning in which the learner is given the opportunity to see the entire visual presentation without a hint, as in this case it is likely that significant interaction with Stimuli or parts of visual content that are not required, but in the case of relying on hints, the focus is on the stimuli that are required to be learned (Osama Hindawi, Sabri Al-Gizawi, 2008).

Cues properties

Hints are characterized by a number of basic characteristics that everyone refers to (Abdul Hady, 2017, 33-34), (Nahla Al-Sayed, 99, 2015), which are:

- Focus: It conveys specific ideas to students to help improve the learner's perception and understanding. It plays the role of summarizing and clarifying the required information, so it is specific and focused to achieve its purpose and on time.
- Education: meaning that it aims to achieve specific educational goals, in a clear manner, to provide learners with a realistic experience related to the content of their learning.
- Connectivity: It is presented through selecting and organizing information related to the subject of learning.
- Familiarity: There should be more familiarity and interest on the part of the students in accordance with their age.
- Comprehensiveness and abstraction: It must be comprehensive, so it represents the accompanying content, interprets it, and makes it meaningful.
- Accuracy and correctness: It should be of a high degree of accuracy, correctness, and commensurate with the presentation submitted.
- Briefness and brevity: The teacher's preparation of hints in a brief manner helps him organize the relationships between ideas and helps his learners remember and retrieve them.

Important of cues

Sami Abdel Hamid (2014) and Mohamed El-Sayed (2011) identified the importance of cues as follows:

Using visual cues can make it easier to pay attention to specific points and remember them.

- Highlight important parts of new information, and provide them with related hints, to provide students with new information in a meaningful way.
- Highlight keywords using visual cues.
- Use hints to clarify the importance of a goal.
- Use hints to help express an opinion about a problem or situation.

Theoretical foundations and principles for using cues (audio-visual)

Cue clustering theory:

(Dotterer, 2011) explains it as simultaneous stimuli that are presented through sensory channels such as sight, sound, or touch, which according to the principle of learning provide many motivational reinforcements. They must be designed in a way that limits the number of simultaneous stimuli that can be processed when presented through Multiple channels. The theory calls for integrating the hints provided to the student simultaneously through his sensory channels. When audio and visual stimuli are combined, the information is represented more effectively.

Information processing theory

learning is a cognitive process described as a change in the knowledge stored in memory, and that memory plays an important role in cognitive learning. Learning occurs when information is stored in memory in an organized manner. This theory also views the student as an information processor, so learning It occurs when information comes from the external environment, then the student processes it, stores it in memory, and then emerges in the form of learned abilities.

The third axis: E- lessons

Definition of electronic lessons

Both Hoda Anwar (2008, 8) confirmed; Helmy Abu Al-Futouh, (19, 2007); Ibrahim Abdel-Wakil, Souad Ahmed (200.14) as:

Lessons are designed through the integration of technology to present scientific material either in print or through the Internet. An educational program based on multimedia and hypermedia that uses the characteristics and resources of the Web for the purpose of providing meaningful learning,

as it accelerates the pace of learning and is supported by lessons that use educational activities and materials on computers and information networks in their design. By providing content rich in interactive multimedia components, the learner's positivity and participation is achieved.

Elements of building electronic lessons

-Objectives

The first step is to design a lesson, based on which the content is determined, appropriate learning situations are chosen, and the teacher also relies on it for proper evaluation to judge the success and achievement of the lesson. (Shawqi Hassani, 2008, 152).

Electronic content

Both Al-Gharib and Zaher agree (2009, 200); Nabil Gad (2008, 97); Muhammad Al-Sayyid (2003, 26) states that electronic content is:

- Mixing the elements of previous multimedia software into electronic content and disseminating it with modern technological tools, the web page, lessons, and the electronic course. (Al-Gharib Zahir, 2009, 200) The number of elements must be at least three, which are:

- Written texts:

The written text means all the written data contained in the pages of the website or program that is presented to the learner during his interaction with the lesson

-the sound

Voices vary from spoken (audible) such as comments and instructions, audible audio, which is an alternative to written text, and still images.

Digital images of real things give the program more realism, as the image provides the learner with accurate contact with reality or changes it according to the objectives of the lesson.

- Animated images

It appears in the form of animated film clips recorded in a digital way. Such a moving image gives the learner the pleasure of watching the realistic presentation, thus explaining to the learner things that he cannot see directly.

- Line drawings

Formative expressions of lines, such as shapes, appear in the form of a line or pie chart, or in columns and other forms of drawing

- Animated graphics

Sequences of fixed, sequential line drawings that are displayed at a certain speed in succession so that these frames appear moving when displayed. There are two types of animation: movement of objects and movement of frames.

Types of E- lessons

- Electronic lessons based on multimedia systems

It is the most common type, and is provided on CDs directly to the student. It can be designed according to the inclinations and abilities of the target student, in which interaction occurs between the student and the educational software, and the student learns according to the learning style that is presented to him.

- E- lessons based on the Internet

It is designed and published on the Internet, and its composition depends on multiple media components in different forms, including texts, animated images, audio and video collections, internal and external links, in addition to the learned materials.

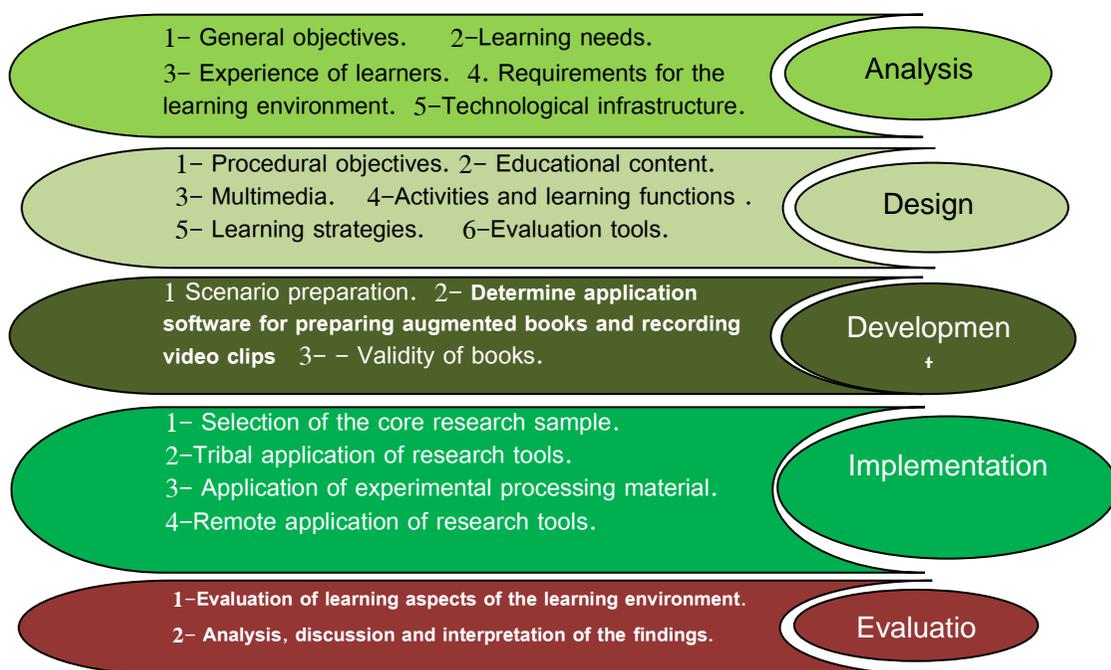
Educational advantages of using electronic lessons

- Increases the learner's ability to achieve.
- It works to maintain the impact of learning on the learner.
- Colors, music and pictures make learning more fun.

- It motivates the learner to participate effectively and actively in the learning process, which leads to a reduction in learning time.
- It works to take into account individual differences among students, as it leaves the learner freedom to control the course of the program and move from one topic to another according to his own speed and ability.

Experimental framework for the research

Preparation of experimental treatment material; Represented in the skills of producing the e-lesson, and it also addresses the preparation of measurement tools, which are: an achievement test on the subject of the e-lesson, an evaluation card for producing the e-lesson, In her presentation of this chapter, the researcher will follow the stages and steps of the general model of educational design “ADDIE” while making some modifications to it to suit the current research. The following is a figure illustrating the outline of the general model of educational design.



Educational design

In her presentation of this chapter, the researcher will follow the stages and steps of the general model of educational design “ADDIE” while making some modifications to it to suit the current research.

First - the analysis stage; Analytical survey procedures:

(Defining the problem and assessing needs, determining general objectives, determining the research methodology, determining the research sample, analyzing the characteristics of the students in the research sample, determining educational tasks and activities: each student in the research sample preparing an electronic lesson)

Second - the design stage; Design procedures:

- Formulating educational objectives:

The researcher formulated the educational objectives in a procedural way that describes the performance expected from the student after learning the skills of producing electronic lessons presented through the enhanced book.

- Determining the educational content: The research was limited to the style of presenting the content (improvement with hints) in the enhanced book, and developing the skills of producing electronic lessons among educational technology students.

- Compiling the elements of educational content: By examining the researcher’s knowledge of some books, references, and educational sources (printed and electronic), as well as seeking the opinions of specialists in the field of e-learning and educational technology, the researcher compiled and selected the content of the skills for producing electronic lessons (facts - concepts - skills) and arranged it. Arranged logically to achieve educational objectives.

- Designing a content sequence method: steps for presenting the content to the students in the research sample.

- Designing research and measurement tools:

(a) Achievement test for e- lesson production skills:

In this step, the cognitive test was built in light of the educational objectives expected of the learners, and in light of the scientific content presented, and reliance was placed on multiple-choice questions and what the picture and arrangement indicate. It includes a multiple-choice style, where four alternatives were developed for each question, from which the learner chooses a choice. Only one, and the test was constructed according to the following steps:

1) Determine the purpose of the test:

The aim of the test is to measure the extent to which third year educational technology students have achieved the cognitive aspect related to the skills of producing electronic lessons, to identify the extent of achieving the goals that were identified when producing the enhanced book.

2) Validity of the arbitrators: It was presented to (7) arbitrators, specializing in educational technology, curricula and teaching methods, to ensure the veracity of the test content and its suitability for the research group, and their opinions agreed that the test measures what it was designed to measure and that it suits the research group.

(b) The final form of the test: The test in its final form consists of (31) multiple-choice questions, and the test is now ready for use in the research experiment in its final form.

(c) Evaluation card for producing an electronic lesson:

An evaluation card for producing an electronic lesson was prepared, with the aim of evaluating the level of learners in the skills of producing an electronic lesson. The card was constructed and controlled by following the following steps:

1) Determine the goal of the evaluation card: The card aimed to measure the performance level of the research groups to produce an electronic lesson. After the research

group finished studying the content, each of them produced an electronic lesson.

2) Assessing the validity of the card: The evaluation card was presented to (7) seven arbitrators in the field of educational technology, to express their opinions on: the item's affiliation to the skill, the importance of the item, and the scientific accuracy of the item. Statements that obtained a percentage of (80%) or more were selected. Of the total experts' opinions, the percentage of experts' opinions on the card's statements ranged between (80%: 100%), which indicates the validity of the card and its suitability for application to the students of the survey group.

1) Amendment in light of the arbitrators' opinions.

The evaluation card arbitration resulted in amending the wording of some items in light of the opinions of the arbitrators

Choosing a learning strategy: Programmed e-learning strategy:

This strategy is closely related to the augmented reality environment, which depends on dividing educational content into small educational units that are linked to each other and support self-paced steps for the students of the research sample.

Third - the development stage; Developmental procedures:

(Preparation of experimental treatment material

Scenario preparation

It is a detailed description of the pages that will be designed and the text, static graphics, video clips, and animated graphics they contain, as well as sound, sound effects, and accompanying music. It is the implementation map that presents the proposed idea in a visual and audio form that

conveys the educational objectives and educational content in sequential, integrated pages that contain many factors. Attraction and suspense through images, movement, sound and colour.

The program scenario was designed and presented in a visual way, and the scenario was presented to arbitrators specializing in educational technology

Through the arbitration form, the arbitrators agreed by more than (80%) on the suitability of the scenario format for use. It was modified according to the arbitrators' opinions, and the scenario format was formulated in its final form, based on which the two enhanced books will be produced for two types of content presentation methods (animated infographics & improvement with hints).) for the skills of producing electronic lessons using the Adobe Captivate program.

Determine the application programs for preparing the augmented book:

Camtasia studio v. 9.0
Adobe Photoshop
Microsoft Office Word 2010
Adobe after effect

Design of the interface for using the augmented book: The interface of the book was designed simple using Adobe Photoshop. A calm color was used for the background of the two augmented books, and colors consistent with the rest of the pages of the book.

Design of augmented book pages: The design of augmented book pages is considered one of the basic matters that must be taken care of, and therefore attention must be given to all aspects related to it in terms of its wording, types, and

components. The pages of the book, written texts, still images, animated infographics, and audio-visual hints were all formulated. Accompanying the skills of producing educational content, the pages varied and differed according to their topic in the augmented book and their purpose. The pages were as follows:

- Cover pages: They are used to display the title of the augmented book, the party responsible for its production, and the educational stage or target group for which it is presented, such as: the front cover page for introducing the augmented book.

Introduction pages: They are used to present a general idea about the subject of the enhanced book, or to present the general objective of studying the educational content, or the procedural objectives for each topic of the book, such as: the general objectives page.

Content pages: Pages that aim to provide the student with new information, as in the pages that present the content of the book.

Activity pages: These are the pages that contain the educational activities that the student performs, implements, and sends to the researcher or assistants.

Evaluation page: This is a page for the final evaluation, as in the multiple-choice achievement test

Determine how marker-based augmented reality works within the augmented book:

The augmented reality models contained within the augmented book are displayed according to a specific mechanism as explained by him

(El Sayed, Zayed, Sharawy, 2011), which consists of the following steps:

Merging: Merging is done by using the Zapper application and merging the real image with virtual reality.

Image segmentation: means finding known elements on the image. These elements are formed using edge and dimension measurement methods. The quality of the separation process determines the success of the process of extracting objects from the image.

Extraction: means finding known elements on the image. These elements consist mainly of corners, lines, shapes, and curves. This stage consists of secondary stages that begin with exploring the corners, then the relevant edges, and finally revealing and enclosing the mark's box. The real mark must be designed in a way that makes it easy to discover so that it is unique. enough; To make it easy to recognize among other signs; So that it can be easily identified.

Camera orientation: Once the mark has been successfully identified, the final step in this process is to determine the location of the mark in space; Because the merged objects will be rendered on the image; Its scope and direction match the detected mark.

Polling the reviewers' opinions on the validity of the application's enhanced book

This stage aims to verify the suitability of the augmented book for use, and the extent to which it is suitable for achieving the goals desired in light of the experimental design of the current research. The augmented book was presented with a questionnaire; To evaluate it and present it to (7) arbitrators specializing in educational technology to survey their opinions about the book's efficiency, its coverage of the content presentation style (animated infographics), and its suitability for application, and then analyze the results obtained, and determine the required amendments based on that.

The opinions of the arbitrators concluded that the books were appropriate and valid for application and achieved the objectives of the research. There were some suggestions for making some amendments, and the required amendments were made and thus the book is ready in its final form for field testing on students..

Fourth - Application stage; Experimental procedures:

Conducting a reconnaissance experiment

The researcher conducted a reconnaissance experiment on a sample of students from the third year of the Educational Technology Division from the same research community, numbering 30 male and female students in the second semester, in order to identify the difficulties that the researcher may face during the basic experiment of the research, and to verify the integrity of the two augmented books and the links to them, and to serve WIFI located in the college's research laboratory and assessing the stability of the achievement test and evaluation card for producing the electronic lesson, and then the opinions and observations of the students of the exploratory experiment were captured in the two augmented books and any obstacles or technical problems were identified before conducting the basic experiment.

Output of the enhanced book in its final form:

In this step, the researcher made the modificatio

First assumption

There is a statistically significant difference at the level of (0.05) between the average scores of the research sample students in the pre- and post-applications of the cognitive test for electronic lesson production skills among educational technology students in favor of the post-application.

to verify the validity of the first hypothesis regarding the comparison between the grades of the students of the research group, the Pair sample t-test was used to compare their grades in

the cognitive test of electronic lesson production skills among educational technology students.

Table (1) T-value between the average scores of students in the pre- and post-measurements of the cognitive test for E- lesson production skills among educational technology students (n = 30 learners) at a degree of freedom (29)

Total	Degree	Applic ation	Numb er Of studen t	Mean	Standard devlation	T- value	Degree Of freedom	Effect size (eta square (d)	Indica tion Effect size
Total	31	Pre	30	6.65	1.32	24.36	29	0.911	Very big
		post		29.47	2.87				

The results of Table (1) showed an increase in the arithmetic mean in the post-measurement for the students of the research group in the cognitive test for the skills of producing electronic lessons. By calculating the value of (T) to indicate the differences between the means, it was found to be statistically significant, as the value of (T) was equal to (24.36), which are significant values when The significance level is equal to (0.000), and then the first hypothesis was accepted

The second hypothesis:

There is a statistically significant difference at the level of (0.05) between the average scores of the research sample students in the pre- and post-applications of an electronic lesson evaluation card for educational technology students in favor of the post-application.

To verify the validity of the second hypothesis regarding comparison between the grades of students in the research group, the Pair sample t-test was used to compare their grades in an electronic lesson evaluation card for educational technology students.

Table (2) The value of (t) between the average scores of students in the pre- and post-measurements in the evaluation card of the electronic lesson test among educational technology students (n = 30 learners) at a degree of freedom (56)

Total	Degree	Application	Number Of student	Mean	Standard deviation	T-value	Degree Of freedom	Effect size (eta squared)	Effect size (eta squared)
Total	56	Pre	30	8.65	1.78	45.65	56	0.793	Very big
		post		65.51	1.46				

The results of Table (2) showed an increase in the arithmetic mean in the post-measurement for the students of the research group in the cognitive test for the skills of producing electronic lessons. By calculating the value of (T) to indicate the differences between the means, it was found to be statistically significant, as the value of (T) was equal to (45.65), which are significant values when The significance level is equal to (0.000), and then the second hypothesis was accepted

Research Recommendations

- Interest in using augmented reality technology for undergraduate students in various educational subjects.

There must be diversity and development in the methods of presenting educational content through technology that relies on visual effects for all different educational levels.

- Paying attention to the skills of producing electronic lessons contained in this research and working with learners in the Educational Technology Department.

-Attention to the presentation of the book enhanced by improvement with hints; It has proven its effectiveness in developing students' cognitive achievement and skill performance.

Proposed research

- Research on teachers' attitudes towards using augmented reality technology in the educational process.

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