

EFFECTIVENESS OF THE DESIGNING OF AN INTERACTIVE TABLET (IPAD) FOR ELECTRICAL AND ELECTRONIC BASICS ON LEARNING ENGAGEMENT OF COMPUTER STUDENTS AND INFORMATION TECHNOLOGY

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ABSTRACT

The objective of the research is to design an Interactive Tablet (IPAD) for the fundamentals of electricity and electronics for computer students and information technology, and to teach them in accordance with the list of interactive electronic book design criteria. And measuring the effectiveness of the interactive book Tablet of the fundamentals of electricity and electronics on their education. The following zero hypotheses emerged from the objective of the research: (There were no statistically significant differences $\alpha \geq 0.05$) (t) between the mean of the experimental group which studied the electrical and electronic fundamentals according to the IPD and the mean of the control group Habitual in Learning engagement). The research community determines the first grade of the computer industry and the information technology department. The researchers used the partial experimental design (the design of the experimental groups and the remote control), and the number of students (56) students, and the two researchers prepared the measure of educational attenuation to measure the dependent variable and it consists of three areas (cognitive, behavioral and emotional) of (42) paragraph, and applied the measure of educational application of the tribal application. (IPAD). The second is the experimental method for the effectiveness of the design of the IPAD. The results resulted in the superiority of the experimental group studied according to the IPAD, which is designed for the students of the control group who studied the same subject in the traditional way of getting involved And the effect of the independent variable (the interactive book) in the two dependent variables. The study of the fundamentals of electricity and electrons in the research sample and their educational effect using the equation of the effect size of Cohen. , As the ETA (0.74) in the Learning engagement, and in the light of the results of the research, the researchers reached a number of conclusions and a set of recommendations and suggestions that could benefit professors of Article

THE PROBLEM OF RESEARCH

The curricula in Iraqi schools suffer from a near-desperate problem, namely, filling them with information instead of helping to develop the abilities and paths of students and learners, and refining their talents and directing them to a destination that suits them all (Ministry of Higher Education and Scientific Research, 2012). The researchers found that the fundamentals of

electricity and electronics taught in the first grade are computer and information technology. They include a theoretical part and a practical part. It is not possible to apply all practical exercises and electrical and electronic connections because there are no laboratories or the lack of possibilities in providing laboratories (logical, electrical and electronic circuits) Or the lack of preparation of the necessary materials by the Directorate of Curricula for Vocational Education, or because of the

seriousness of conducting such experiments on students, which led to a focus on the theoretical side more than the practical side. And the teaching of the material is often difficult because of the nature of its theoretical and dry materials accompanied by a great effort of the teacher in the preparation and explanation and application of skills, and the lack of use of devices such as the introduction of the device (Ipd) in classrooms or virtual laboratories like developed countries

RESEARCH IMPORTANCE

The design of the interactive book and the broad enrichment of the educational curriculum in the industrial education schools will be the basic step to familiarize students with self-learning. On the visual and audio effects and video clips, and require the learner to interact with all his senses (Naeem, 2011: 4). This was confirmed by the Arab Conference held in Tripoli, 22-24 April 2016, stressing the use of electronic innovations in the process of teaching and learning, and the use of multimedia because of their impact in stimulating the senses of learners, developing their creative thinking and making Education is more flexible (Tripoli Conference, 2016). The views of Dunne & Bagnall (2013) and Cooper & Owen (2013) agreed with the educational importance of the variable of educational engagement among high school students as the learner can fully integrate into educational activities, leading ultimately to the achievement of originality, innovation, And academic competence (Moriama, 2017: P. 280). The United Nations Educational, Scientific and Cultural Organization (UNESCO) has stated that maximizing students' preoccupation with classroom learning is one of the most important pillars of learning in the 21st century (Finn & Zimmer, 2012). The importance of improving and improving education in general And its educational curricula in particular in Iraq, And this was confirmed by the Baghdad Conference in 2010 (Iraqi Ministry of Education / Curriculum Development, 2010). (Illustrating standard indicators and global experiences on how to design a computer-generated interactive book). (The practical aspect through the programming of a virtual laboratory and its importance to the fundamentals of electricity and electronics for the application of all practical exercises and the conduct of connections to the circuits of electronic and logical and electrical, which

leads to a simulation between the interactive laboratory and student Foudi to encourage the design and innovation of innovative circles. Centered in all areas of knowledge and emotional and emotional student

THIRD: RESEARCH OBJECTIVES.

- a. Designing an Interactive Tablet Book (IPD) according to the list of criteria for designing interactive electronic books for the basics of electricity and electronics in computer students and information technology
- b. . Measuring the effectiveness of the interactive textbook of the basics of electricity and electronics on the Learning engagement, of computer students and information technology

FOURTH: THE HYPOTHESES OF THE RESEARCH THE RESEARCHERS FORMULATED THE FOLLOWING ZERO HYPOTHESES:

- 1- There is no statistically significant difference at the level between the ($\alpha \geq 0.05$) (average scores of the experimental group which studied the fundamentals of electricity and electronics according to the designed interactive book and the average score of the students of the control group that studied the same subject in the traditional way of learning.
- 2- Measuring the impact of the effectiveness of the interactive book on the Tablet to the following variable (educational engagement)

FIFTH: RESEARCH LIMITS.

The research is determined by students of vocational education 2017-2018, Industrial Preparatory for Morning Studies, Grade I / Computer Departments and Information Technology, Gender: Male, Essentials Electron and Electricity

SIXTH: DEFINITION OF TERMS

•**Effectiveness:** (Good, 1979) as: the ability to achieve the desired results with the economy in time and effort (Good, 1979: p 207.)

The procedural definition of effectiveness: (the set of indicators of change) produced by the interactive Tablet PC (IPD), which is designed after experimenting with the

students of the first industry / computer department and information technology in the rate of increasing the educational engagement of students

• **Design:** Aljuban and Ahmed (2003): Analysis of the educational situation and its organization in the form of specific educational units to be taught within a specific time and the formulation of a descriptive structure of what the educational situation will be of the objectives, knowledge, activities, methods and teaching materials, and what will serve the learners, Calendar and Development (Coward and Ahmad, 2003: 31)

The procedural definition of the design: the set of organized and sequential procedures that have been followed for the design of the interactive book through the following stages (analysis, design, development, implementation, evaluation) to interact with the students interactively, and the greater the quality of the interactive book design the more efficient the book is educational and technical.

• **Interactive Ebook.** Zalaznick (2014) defined it as "the best strategy for learning in a multimedia curriculum that designed an educational design, containing videos, interactive animations and symbols to create the needs of learners in audio, video and text, through which interaction is performed." (Zalaznick, 2014: P. 31)

Procedural definition of the interactive book. Digital content is similar to the printed paper book is written on the basis of psychological, educational and technological design in the light of the standards of interactive electronic books for the fundamentals of electricity and electronics for the first grade industry / department of computer and information technology, and contains an integrated electronic environment to give the opportunity for learners to learn anywhere and anytime, A textbook can be viewed and viewed in a paper-like way. Each page represents multimedia (static and animated images, interactive videos, graphics). The stored sounds can be listened to, and the interactive book can be read on the Computer endowed, computer tablet, and mobile devices, and the devices (IPAD).

• **IPD tablet.** (Wilson, Mojica, &Confrey, 2013): It is a tablet that has the ability to operate several media including eBooks, interactive books, newspapers, music and games. Its screen features fast touch, sound and clear image (Wilson, Mojica, &Confrey, 2013: p). 434)

Procedural definition IPAD: is a high speed touch screen computer and a technology that combines the characteristics of a computer and mobile phone with which to read and operate the interactive e-book at any time and anywhere without the need for a connection.

• **Learning Engagement Dunne (2013):** Achievement of high achievement levels for certain classroom assignments is given to students by their teachers. This definition consists of three areas: emotional, behavioral and cognitive (Dunne & Cooper, 2013: P. 543)

CHAPTER SECOND / THEORETICAL FRAMEWORK

First: the interactive book.

The emergence of e-book. The e-book originated in the 1960s, with sound and animation added to it. Andree van Dam was the first to co-founder the term e-book in 1967 and the first group of hypertext System

it was supported by IBM (Izzet, 2012: 56). While some believe that the invention of the e-book is due to Michael Hart (1971) Michael Hart founder of the Virtual Library. In 2007, Amazon released the first generation of Kindle, a lightweight and easy-to-download e-book. In 2010, Apple's first portable tablet was released (Ismail, 2013: 39)

The role of the teacher in interactive e-learning:

Fairness (2016) suggests that some teachers may hear using interactive e-learning in the classroom. It is believed that his role has ended in the teaching process, and will be replaced by computer or mobile, and this is completely the opposite of reality. Interactive education makes the role of the teacher more effective and important because the teacher who teaches his students interactive education is a creative person and highly efficient and has the ability to work in electronic center and management programs and management of e-learning effective (Muhammad Justice .2016: 88). The teacher's role is defined as:

1- **Researcher:** One of the most important roles, as he searches for everything that is new to the scientific material to be presented to his students and provides the curriculum through interactive e-learning.

2- **Introduction to content:** The process of providing content has a link to the teacher, and this process needs to

the various competencies that the teacher must master in order to be able to provide interactive electronic content in an easy, easily accessible, and can be retrieved and dealt with.

3- **Technology:** The technological teacher is the one who keeps pace with developments and developments in how to deal with the basics of dealing with computer and browsers and programs protection from files and other important competencies (Elephant, 2016: 89.)

4-**counselor:** He has the largest role in facilitating communication, guiding them in dealing with the interactive content used by students, and responsible for the relationship between students while interacting with interactive electronic content.

5-**Rectifier:** Has the ability to identify the strengths and weaknesses of students.

6- **Leader:** manages the educational situation through effective e-learning through the process of electronic networking between students and methods of presentation (Abu Zaida, 2013: 209).

Interactive book design

First: general educational design. The design models used in the teaching process are many, simple ones, complex ones, but they all share common elements. They differ because of the difference in the school they belong to, but they all diverge from the systems approach to educational design, which consists of several elements: analysis, design, , Implementation, calendar). The ADDI E is the basis of all instructional design models, providing the designer with a procedural framework that ensures that the products are effective and efficient in achieving the goals. This design split nearly (100) designs (Azmi, 2013: 67).

1: Analysis: Analysis is the cornerstone of all other stages. During this stage, you must identify the problem, its source and possible solutions, analyze all aspects of the educational process that represent the system inputs, and aim to analyze the learning environment

2- Design: Logical and scientific steps to design, produce, implement and evaluate learning, goals and educational needs, and interest in the development, testing and re-examination of educational activities (Salem, 2004: 124).

3- **Development:** Translation of the outputs of the design process from scenarios, plans, strategies and study plans to real educational materials. The educational

situation and all the educational means that will be used in the design of the interactive book and the interactive program (Al-Khalifa, 2010: 23)

4- **Implementation: Called teaching / learning,** focused on product testing, involves testing materials or applying teaching, or lessons planned at the design stage where the actual measurement of teaching is conducted. This phase aims at achieving efficiency and effectiveness in teaching, understanding students, As well as the stage of discovery for the designer. A formative evaluation is carried out as part of the stage, integrating the implementation stage with the next stage, namely the calendar (Al-Mashaala et al., 2015: 87).

5- **Evaluation:** The efficiency and effectiveness of the teaching and learning process is measured at all stages. Evaluation is to give value to something according to levels or criteria that have been set and defined in advance (Shahin, 2011: 270).The design of A.D.D.I.E has been designed for the interactive book design tablet for the clarity of its components, details and comprehension of all stages, and the possibility of use in educational situations, including interactive

Second: viscous designThe interior design of the interactive electronic book includes viscous design and behavioral design. Norman has described the viscous design as "how to visually look at design." For example (when we look at something as beautiful this judgment comes directly from the visceral level). This design is especially important when designing interactive e-books, as it increases student focus and attention to reading the existing scientific material, and the designer may think of creating a design that promotes positive interaction with the content of the interactive e-book. Norman points out that "attractive and beautiful design has an impact on how the user interacts with the product." The attractive things make people feel comfortable, which in turn makes them think more creatively, so viscous design should be considered in the creation of e-books in order to attract the reader, while creating a lasting impact on the reader (post interaction). By inserting the viscous design at the aesthetic level, physical properties such as the shape, appearance and sound of the eBook generally create an interactive experience (Nigthy, 2012: P. 25).

E-book design standards

After studying the studies and a number of international standards for interactive books, the two researchers came

to construct and prepare the stages of the interactive book criteria for the current study from:

First: Educational standards. The elements of the curriculum are to formulate the objectives in a manner that is sound and sensitive to all aspects of learning and individual differences, and the scientific content that is characterized by honesty, modernity and objectivity. It should include the concepts, ideas and facts included in the learning subjects, taking into account the link between the goals, the multimedia, , Illustrations, static and animated images, and video clips, taking into account the content and learning objectives to be achieved.

Evaluation: It provides the formative calendar during the study of chapters with the use of different methods to provide feedback, as well as the final calendar.

Second: Technical standards. It consists of several areas (general browsing standards, sound standard, fixed and mobile image standard, video standards, font and color).

Third: the tablet (IPAD): The first idea started on the computer tablet was by (1972) Kay where he was just imagining his name was Dinabook was his computer tutorial, but he wrote in his blog and the name of the personal computer, was not known or famous at that time, The computer will become smaller and cost less over the years, and people will be able to buy their own computers, but his perception did not go any further than to expect the PC to be portable (Smaldino et al., 2012: P. 587). The first portable tablet device introduced by Grid in 1993 was called the Grid Pad and a system operated by Baldwin and the pen. Some companies, such as GO, introduced their products. Then, in the same year (1993), Apple released the "Pad Pad" (Massa Pad), which introduced the concept of digital assistant, which is based on the familiarity of handwriting recognition, after which Microsoft introduced the first model of the Tablet PC Which is compatible with the system that Microsoft has installed with a license from Windows Xp Tablet Pc Edition. Years later, Apple launched its first mobile tablet, the Ipad, with the Apple Ois multi-touch screen, and Samsung's Galaxy Tap (2010) with the Android (Shammrani 2013: 30). He has paid attention to learners since its inception, and the demand was many, (Apple, 2010: P. 13) The Tablet PC is an intermediate state

between the Lap Top and smart mobile phones. It combines their advantages. It has spread and made a quantum leap in the educational process, which has made many Arab and foreign countries to use and have conducted and are still conducting studies and research on them to know their impact and effectiveness, It became the nucleus of (classroom technology) (Itech, 2012: P. 44).

The advantages of Ipad and the integration of its application in education. The Apple Ipad is one of the most popular mobile devices because of its accessibility features:

- 1-It can be used by children ages 6 years, for easy instructions for - operating it.
- 2- The touch screen is manipulated between the objects of the material displayed and the motion characteristic (Roblyer&Doering, 2013: P. 632)
- 3- The Ipad learning process takes place anywhere and anytime, which supports time stimulation.
- 4-Raise collaborative and collaborative learning between students themselves and their teachers.
- 5- The ability to exchange information and e-books among students, the speed with which students have access to learning experiences, and the ease of pregnancy that provide a flexible, effective and integrated content model as well as relevance to activities (Asaad Khan, 2014: 310).
- 6-The technology, which includes the camera in the device, uses the tablet to record and retain documents, and can be called when needed. The camera can also be used as a document camera (Isaacson, 2011: P. 490)
- 7- Ability to connect to projectors such as speakers, interactive whiteboard or others (Ruwaiti, 2014: 200)
- 8- Battery charging time is extended to 10 hours (Heinrich, 2012: P. 335).

Thirdly: Learning engagement. There are different views of Learning engagement, but most of them are quite similar in their meaning. Newman's (1986) finds it difficult to define operational engagement in practice, but

when the student devotes considerable time and effort to the task, when he cares about the quality of their work and when they are committed to performing their work. This is because the work is of great importance beyond their personal devices (Newman, 1992: P. 242). Marks (2000) believes that the behaviors a student takes when actively participating in the classroom, completing school assignments in the classroom, and participating in discussions related to the course. And thus represents a psychological process, specifically in the response and interest and investment in the effort of students (Marks, 2000: P. 154-155) Fredricks & etal (2004) views it as a construct of a variable consisting of three areas: behavioral engagements, emotional exhaustion, and cognitive attrition, and represents a rise in low achievement levels among students (Fredricks & etal, 2004: P. 156)

The theoretical basis for the concept of Learning engagement

. There are two main directions in the field of Learning engagement. First-orderists adopt motivational theory, often incorporating motivational structures into their model, and see interaction as the outward appearance of student motivation. (Skinner et al., 2008: p443)

The second trend refers to the educational dimension of the cognitive dimension (students' desire to invest in education), the emotional dimension (positive student feelings towards teachers and peers), the behavioral dimension (ie behavioral participation of students in school), and the dimensions of Learning engagement. (Fredricks et al., 2012: P. 321) Dunne (2013) pointed out that the term "learning task" refers to the student's cognitive investment, which is the active, emotional, and limited learning tasks given to students in the classroom by the teacher. It consisted of three interrelated areas used to assess students' learning levels of engagement (Dunne & Cooper, 2013: P. 509)

Relationships between components of the three disciplines (cognitive - emotional - behavioral). The three components of engagement are often linked to each other in essence, which represents an important dimension of the learning engagement of the student, and that they interact with each other to influence the level of interaction of students during the educational process,

some researchers pointed to a set of models as follows: The model (Fredricks et al., 2012) indicates that learning engagement represents the interactive relationship between students' three types of interaction, by interacting with each other with the same types with the same intensity and effect on the emergence of student learning engagement, and vice versa for all other species (Gibbs, 2013: P. 24)

The relationship between the interactive book (IPAD) and theoretical engagement. Researchers in the fields of computer programming, education and psychology have worked to design interactive interfaces to find out what is best in helping individuals learn, to document the benefits of integrating interactive technology into education and to improve student performance in the classroom. Early discussions focused on whether there was a fundamental difference between interactive learning and learning in more traditional ways. The debate continued for ten years on this subject between Meissner (2012) and other researchers. In an attempt to explore the hypothesis that "people learn words and images better than words alone, To change the focus and focus of light to find ways to help people learn through multimedia education, including on the tablet. "Schools have begun to join the education that calls for increased use of interactive technology (Meissner & Bongner, 2012: p. 124). On the other hand, Studies have indicated that technology has an impact On the interaction of individuals in terms of the extent to which students can be highly educated, which is influenced by the content and content of the intermediate environment in the interaction between learners in the classroom (Machher et al., 2012: P. 210). The interaction is as follows:

- Interaction between the learner and the teacher: Two-way communication between teacher and learner, occurs when the teacher seeks to stimulate interest, clarify questions, stimulate, and converse with the learner (Gibbs 2013: P. 200).
- Interaction between the learner and the content: This interaction is the process of interaction of the learner with the content intellectually, and is defined as the interaction between the learner and the content being studied (Park & Brunken, 2014: P. 631).

Meissner (2014) notes that technology provides us with opportunities for co-education to enable learners to engage in the same materials or materials simultaneously through technological devices such as Nook, Kindle, and Ipad. Educational technology enables students to work, discuss and dialogue together, although they may be present in different physical locations (Meissner, 2012: p. 124)

THE THIRD CHAPTER: RESEARCH METHODOLOGY AND PROCEDURES

First: Research Methodology. The research methodology is considered one of the most important methods of research in the educational and psychological sciences, because it is one of the most widely used methods due to its relevance to issues and problems related to this aspect (Al-Manzel and Adnan, 2010: 269) In the application phase of the interactive book design, the researcher followed the experimental method to see how effective it is in the achievement of students of computer and information technology and their educational implications. This method is one of the important research methods that try to address the problem, Natural Sciences is the closest to solving problems in the scientific way. It is a method that depends on trying to control all the variables and factors that affect a phenomenon, except for one factor that is controlled by the researcher in order to determine and measure its effect on the variable or dependent variables (Jabri and Daoud, 2013: 93.)

Descriptive method . The two researchers used the descriptive approach in constructing the proposed interactive book by preparing the educational design of the interactive book according to the interactive electronic standards (see the literature and previous studies and theoretical design of the interactive book). The two researchers found that there is agreement on the basic stages of building the educational programs, Analysis, design, implementation, development and evaluation). Each stage contains a number of steps, which the two researchers have adopted in their current design on the general design of education (ADDIE), because of its flexibility in building educational designs, One of the most widely used teaching design models, this model is simple and works flexibly in many different contexts to

support the creation of educational plans, learning experiences, and learning materials (Afon, 2012: 160).

The two researchers identify the steps adopted at each stage of ADDIE to design the proposed interactive Tablet book through the following table:

•**Analysis:** access to previous literature and studies, identification of the content of the paper book, identification of the general objectives, identification of the target group, identification of students' input **behavior:** analysis of educational needs, characterization of students, selection of educational aids,

•**Design:** formulation of behavioral goals, interactive book design, building a list of interactive electronic books for the basics of electricity and electronics, preparation and design of the program interactive book, interactive program, design and preparation of teacher guide and learner guidance, design strategies used

•**Development:** Conducting a preliminary pilot test to diagnose the strengths and weaknesses of the book experiment on students and teachers

•**Implementation:** Experimenting the interactive book on a sample of students, making a decision on the use

• **Calendar:** Determining the methods of evaluation as follows: (A - Temhadi B - Formative C - continuous D - final e - Program)

Experimental method. This course deals with the procedures required by the current study experience, namely, the research approach, experimental design, the study society and sample, the equivalence procedures between the study groups, the income variables and their control, the study tools,

First, experimental design. The most suitable experimental design for the current research is the partial experimental design (the design of experimental and control groups with pre and post test), as this design (Hussein / 1, 2017) provides accuracy in the results, Research, as well as that this design controls all factors that determine internal safety as in Table (1)

Table (1): experimental design of the research

Totals	Variable Test	Independent variable	The dependent variable	Post-test
The experimental group	learning engagement	Interactive Ipad	learning engagement	learning engagement scale
Control group		Traditional method		

Second: The research community and its sample includes the industry / computer and information technology industries located within the province of Baghdad (Karkh / Rusafa) for the academic year (2017/2018). The sample was selected by random stratification. The equivalence of the two research groups The students of the two research groups (experimental and control)

1- The chronological age in months was obtained and the arithmetic mean and the standard deviation of the two groups were extracted. The significance of the difference was determined by calculating the value of Mani Tenni calculated by the calculated value of 0.510, which is less than the value of the tennial value of the value (1.960). Therefore, the value indicates that there is no statistically significant difference at Level (0.05) and degree of freedom.

1-Otis-Lennon Intelligence Test: The mean and the standard deviation of the two groups were extracted. The difference between the mean of the two groups was determined by calculating the value of the calculated value of the calculated calculated value of (1.102) , Which is less than the value of the table and the tabular value of (1.960). Therefore, this value shows that there is no statistically significant difference at the level of significance (0.05) in the end table of the table of T values. This indicates equivalence

3-Test previous knowledge. After applying the test and obtaining the scores, the significance of the difference between the mean of the two groups was determined by calculating the value of the calculated value of the calculated calculated value of (1.333), which is less than the value of the nominal value of the tabular value of (1.960). Therefore, this value shows that there is no

statistically significant difference at the level of significance (0.05) in the infinite table of the T-values. This indicates the equivalence of the two groups

Third, the tribal application of the measure of learning engagement: The existence of a tool to measure educational exhaustion, and after reference to previous studies and based on the literature and theoretical studies on foreign educational exhaustion, and measures in them, the researchers were keen to translate and formulate paragraphs in a manner consistent with the objectives of the research, 42). After ascertaining its cykometric properties, it was ready for application.

The significance of the difference between the mean of the two groups was determined by calculating the value of the calculated value of the calculated value of (0.558) which is less than the value of the nominal value of the tabular value of (1.960). This value shows that there is no statistically significant difference at the level of (0.05) in the infinite table of the T values

Fourthly. Control of some external variables (internal safety) (Accidents associated with experience, maturity, experimental extinction, measurement tools)

Fifth: Effect of experimental procedures (external safety) (confidentiality of research, distribution of shares, teaching aids, duration of experiment, physical control, identification of factors related to individuals, teacher, subject matter)

(1) Identification of the educational material: The scientific material assigned to the current research, which will be taught to the students of the experimental and control groups according to the vocabulary of the

curriculum for the fundamentals of electricity and electronics (first year computer and information technology branch), prepared by Eng. Khalid Abdullah Ali, (136). These units were determined based on the nature of the experiment and the length of time allowed for the purpose of completing the research.

(2) Formulation of behavioral objectives. After studying the general and special educational objectives and the content of the scientific article on the fundamentals of electricity and electronics, relying on the sources and literature, and the opinion of the teachers of the material and the methods of teaching, it derived a number of behavioral objectives related to the research material, and developed a list of its own in its initial form. In defining behavioral goals at the six levels of Bloom's classification in the cognitive field (knowledge, understanding, comprehension, application, analysis, synthesis, and evaluation)

Sixth: The Research Tool: The Educational Inclusion Scale The aim of the scale is the ability of the scale to measure educational achievement, and the extent to which students possess educational comprehension, which is the fields (cognitive exhaustion, emotional exhaustion,

Statistical analysis of paragraphs:

A: Through the statistical analysis, the t-test was applied to test the significance of the differences between the two extremes, since the T value of the difference signifies the discriminatory force of Ghiseli et al. (1981: 434). (0.177) and the largest discriminant value (14.078). It was found that all the paragraphs have the ability to Table ((2

distinguish at the level of significance (0,05). All calculated T values were greater than the tabular T value (1,98) and at liberty level (112.(

B. Internal consistency (s): Internal consistency was verified by calculating the Pearson correlation coefficient to derive the correlation between each of the scales and the total score. The advantage of this method is that it presents a homogeneous measure in its paragraphs, The college had the potential to include them in a larger scale. For this purpose, a statistical analysis sample of 210 students was used. Statistical analysis showed that all the paragraphs of the scale were statistically significant at (0.01) and freedom (208) when compared with the tabular value (0.139). In addition, the correlation of the paragraph score was calculated by the field to which it belongs, which measures the internal homogeneity between the paragraphs of the field, and all the paragraphs were statistically significant.

(C) Link the other domain degree domain (correlation matrix)

In order to verify the veracity of the dimensions of the scale, the two researchers adopted the total score for each field of the scale and the total score of the scale, after which an internal test was made to extract the validity coefficients of the single field, Between the score of each field and the other fields and the overall score of the respondent. After obtaining the results and comparing the coefficient of correlation calculated by the table value of the correlation coefficient, all the dimensions were statistically significant and at the mean level (0,05) as shown in Table (2).

Internal correlation matrix between the fields and the degree of scale college

the field	Cognitive	Emotional	Behavioral	Total score
Cognitive	1	0.454	0.296	0.754
Emotional	0.454	1	0.436	0.863
Behavioral	0.296	0.436	1	0.695

It was found that all the correlation coefficients of the tables mentioned above are good when compared with the scale value(0.139) at the significance level (0.05) and the degree of freedom (208)

Eighth: The psychometric properties of the measure of learning engagement

a. This was achieved when the scale was presented in its preliminary form to a group of psychologists and psychiatrists, and their opinions and guidance were expressed in the validity of the paragraphs, and the validity and exclusion of the invalid.

B. The validity of the construction was achieved through some of the following indicators and indicators, when the researchers calculated the strength of the parity of the paragraphs as well as the relation of the degree of the paragraph to the overall degree of the scale, and the relation of the degree of the paragraph in the area to which it belongs, all indicated that the paragraphs are significant and distinctive.

Second: Stability of the scale: The researchers used two methods:

a. **Method of re-testing:** The researchers re-applied the test after two weeks of the first application, and then calculated correlation coefficient Pearson between the first application degrees and degrees of the second application of 50 students of the sample, the correlation coefficient over time (0.98.)

B. Alpha Kronbach coefficient of internal consistency. The Alpha Kronbach equation was used for 210 students of the stability sample. The coefficient of stability was 0.86. This indicates that the scale has a high degree of stability. The two researchers are confident that it will be applied to the sample of the study (Foran, 1961: 384).

Final Absorption Scale: The final form of the measure consisted of (42) paragraphs

THE FOURTH CHAPTER: VIEW RESULTS: VIEW LEARNING ENGAGEMENT**RESULTS**

To evaluate the null hypothesis that there are no statistically significant differences between the average educational achievement of students in the experimental group who study the proposed proposed interactive book and the average educational degree of the students of the control group studying the

basics of electricity and electronic without the electronic book

After the application of the measure of **learning engagement** on the two groups of research (experimental and control), the mean and the standard deviation were calculated. The data were processed using Mann Wattini to determine the significance of the differences. The data were extracted using (Mann Wettney) for large samples of more than (20) (Non-teacher) for statistically significant differences between the two groups. The calculated value of manna was expressed by (calculated value of the value), which is (6.428), which is greater than the value of the table (tabular value) of 1.960 at the degree of freedom (∞ infinity) and the significance level (0.05) However, there are differences between the average of the control group and the mean of the experimental group in the educational attrition scale and for the larger average experimental group.

Determination of the effect size of the independent variable (I PAD) on the variables dependent on the achievement of the fundamentals of electricity, electronics and learning engagement

The Cohen Index (Cohen, 1988) is based on the extraction of the educational value of the educational component divided by the sum of the two groups (Khafaji, 2015: 20), Cohen proposed three levels to determine the magnitude of the impact (η^2) for Cohine reflecting the magnitude of the effect (practical significance). The square value of the educational attenuation scale divided by the total of the two groups (0.74) and the comparison of the values with the criterion specified above shows that the magnitude of the effect is significant, The interactive book (IPAD) has a high impact on the student's educational variable (educational engagements) for the fundamentals of electricity and electronics.

Second: Interpretation of the results:

1- Modernity of the book has helped to meet the actual needs of students to employ interactive program applications and specialized programs in the implementation of practical exercises, which led to increase their educational activity, as confirmed by the study Anthony (2014.)

2-The book and the interactive laboratory provided a variety of forms of interaction that led to the effective participation of students in the educational process, and the completion of their duties with ease and pleasure compared to students who study in the traditional way, as confirmed by the study Canda (2014).

3- The students at this stage found in the presentation of information through the interactive book in a way that satisfies their wishes to demonstrate their scientific abilities, and thus increased their attention intensity and the strength of observation and activity and follow-up lesson, which increased the cognitive, behavioral and emotional engagements of students such as Anthony (2014) Study by Peter John (2014).

CONCLUSIONS

1-The application of the interactive book is one of the steps of the modern teaching model, which aroused in the hearts of students the dynamic and simulation and interaction and inspired the spirit of cooperation and love to participate in the lesson

2- The relevance of the interactive book for students of industrial education, for the students of this stage of maturity and the desire to learn many interactive electronic concepts.

3-The role of the guide guide students helped to study how to study the basics of electricity and electronics and serial mastery, and how to implement the practical exercises in the article.

RECOMMENDATIONS

1- To urge the responsible authorities to prepare and design interactive books and e-books and to adopt the experience of the interactive book material electrical and electronic basics in the directorates of education and vocational education

2- Awareness of the importance of interactive electronic learning Tablet (IPAD) through the media and educational bulletins and training programs and educational groups of society.

3- Preparation of a teacher's guide that includes modern teaching models, including interactive books for the effectiveness of teaching. This is proved by the results of

the current study with the need to develop models of e-learning teaching plans to illustrate how to benefit from them.

4- Holding training and development courses for supervisors and teachers of the basics of electricity and electronics in the Directorate General of Education in how to use and introduce electronic interactive books in the curriculum and apply them in all stages of study.

Proposals The two researchers propose conducting researches that address:

1- Effectiveness of the design of an interactive book to collect the design material and develop the tendency of vocational education students towards the profession.

2- Effectiveness of the interactive book design for the development of reflective thinking on the subject of communication for industrial education.

3- A comparative study between web based learning, computer-based learning, and computer simulation in the development of innovation, creativity, scientific thinking and problem solving skills.

4- Effectiveness of the interactive book design in the development of the engineering thinking of mathematics for intermediate stage.

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