

# **Anchored Learning Evolution in Interactive Electronic Environment and its Impact on Developing Digital Awareness and Academic Adaptation for Education Technology Students at the Faculty of Education- Ha'il University**

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## **Abstract**

*The current research aims at recognizing anchored learning evolution in interactive electronic environment and its impact on developing digital awareness and academic adaptation for education technology students at the Faculty of Education, Hail University. The researcher uses both of the descriptive and experimental approaches to answer the research questions. The research tools that have been applied and the findings have underlined, in calculating the value of (T), a statistically significant difference between the average scores of students in the pre and post-application in favor of the post-application at the level (0.01) of digital awareness and academic adaptation scales. This illustrates the impact of anchored learning in developing digital awareness and academic adaption. It is proved that the impact size has reached (0.94) and (0.96), and has shown a high impact strength that has reached (7.75) and (9.79), which is considered an indicator of the effectiveness of anchored learning on digital awareness and academic adaptation.*

**Key Words:** anchored learning- interactive electronic environment- digital awareness- academic adaptation

## **1. Introduction**

Anchored learning is one of the educational forms based on educational technology for designing interactive learning environments. It focuses on / centered in a meaningful-based learning context through posing problems, whose learning environment content is introduced in a realistic and comprehensive way. It depends mainly on learning through situations and through immersing in reliable contexts. It is also called situated learning and anchored instruction. (Hochholdinger & Schaper, 2013, P. 9) (Sener, 2013, P.5).

According to Hartanto & Reye (2013), Anchored learning is also known as one of the educational forms based on complex problem-solving in integrated learning contexts. These contexts take the form of drawing realistic links that make learning meaningful for students. It is a technology-based learning

approach that falls under the Social Constructivist Learning Model and it provides students also with realistic roles that enhance the learning process (P. 5).

In 1990, anchored learning is developed by the Cognition and Technology Group at Vanderbilt University (CTGV) under the leadership of John Bransford. This group has designed a range of multimedia programs, i.e. the adventures of Jasper Woodbury, based on anchored learning strategy (Mattar, 2010, P. 3) (Pappas, 2015, P. 1).

Chapman (2014) pinpoints that Anchored learning is a learning strategy that depends on learning through meaningful situations known to the student, so that it arouses his interest, enables him to identify and distinguish problems, and explore content from various and different perspectives (P. 59).

Vye (2008) defines anchored learning as one of the construction learning strategies that aims at creating a learning environment that helps in complex problem-solving, overcoming inactive knowledge problem and positive attitudes towards learning, where the learner acquires knowledge, facts and skills, but does not learn how and where to employ them? He has not learned how to organize knowledge and apply it in real life. Electronic anchored learning provides the learner with the real opportunity to employ and organize knowledge in a real context, so that he/ she can remember it later and apply it to solve problems in real life (P.1).

Lee (2002) explains that anchored learning focuses on real learning in complex problem- solving that distinguishes the actual life people live in. This strategy also concentrates on collaborative work in small groups to generate sub-problems and find solutions to them by benefiting from the data obtained during this process and providing the learner with a realistic learning environment that facilitates the problem. It also develops problem-identifying skills and enhances group efforts among students during collaborative work in accomplishing a realistic task (P.1102).

From the above, it is clear that anchored learning aims at applying knowledge in solving life's problems. As seeing how to apply knowledge to solve real-world problems by the student can increase his interest and effort in the learning process and make it easier to call information when faced with another similar problem in the future. It helps to improve his achievement in multiple applications, as well as to develop his ability for academic adaptation and to have digital awareness.

As for digital awareness, Mohamed (2010) asserts that it refers to knowing and understanding digital revolution, its dimensions and applications in information and communications fields, The digital awareness is the knowledge and understanding of the digital revolution in its dimensions and applications in the fields of information and communications as well as in searching, investigation and documenting information, retrieving and processing it in various forms, in addition to its production, distribution or transmission and reception. Besides, the ability to know when information or problem is needed to be able to distinguish, locate, evaluate and use them (P. 21).

The goal of digital awareness is to identify the characteristics of the system, its inputs, output and operation, and evaluate each of its components; develop the concept of literacy from just knowing how to read and write to inability to deal with modern scientific methods; learning about different learning sources and not rely solely on the textbook or teacher.

Mohamed (2010) asserts that digital awareness is an urgent necessity in the 21<sup>st</sup> century (P.20). AL Dobian (2011) aims at recognizing the reality of digital information awareness among Imam Muhammad bin Saud Islamic University staff-members and its impact on the development of scientific research. The sample was made up of 51 staff-members of Imam Muhammad Bin Saud Islamic University in Riyadh. It

was found that most faculty staff-members believe that Saudi universities should pay attention to training courses, and the continuity of education to activate strategies of developing digital awareness skills.

According to Abdel Hafiz and Fasih (2015), academic adaptation is the ongoing dynamic process that a student undertakes to understand and succeed in the courses, and to achieve compatibility with the university environment and its basic components, including professors and colleagues. It is also known as the set of ideas and behaviors used by the student with full awareness to deal with or control the impact of expected situations in the future within his environment. (Chatane and Bin Lakhal, 2019, P. 27)

Abu Fuda (2020) asserts that areas of adaptation are diverse, including social adaptation related to establishing a harmonious relationship between the individual and his social environment in which he lives and understands the socio-cultural context, and the academic adaptation that occurs when university students face a wide range of pressures, especially in the first year, such as establishing good relations, adjusting relations with the family, increasing costs, developing study habits, and acting as an adult and self-reliant. Besides, the new university environment is a source of fear and concern for them. (P. 81).

Melhem and Abbas (2012) found that there are statistically significant differences in the level of emotional intelligence, academic and social adaptation, the self-esteem of teens and their average counterparts in Jordan's Irbid City. According to Abdel Hafiz and Fusaih (2015), Baghdad University students have a good academic adaptation. They found that there is a positive correlation between scientific thinking and academic adaptation. Chatane and Bin Lakhal (2019) found that students of social sciences and humanities at Ziane Achour University at Djelfa have a high level of academic adaptation and that there are no statistically significant differences in the academic adaptation attributable to gender, section, and residence variables. Furthermore, Abou Foda (2020) founds that there is a positive moderate correlation between life skills and their overall dimensions and with the academic adaptation.

## 2. Research Problem:

Traditional teaching methods do not concern with stabilizing and employing knowledge. The main aim of anchored learning is to overcome the difficulty of learning facts through creating assistive environments and programming that allow continuous exploration by students. It also enables them to understand the type of problems they face on various topics, especially in the field of education and computer technologies. It also helps students to learn the value of exploring the same topics from multiple perspectives and solving problems through more than one method, as well as making programming to solve those problems.

Furthermore, teachers and learners deal with information as facts that are preserved and it is too difficult to distinguish between important aspects of information. Therefore anchored learning has been used to compensate learners' lack of experience and knowledge through (interactive techniques, multimedia, video, sound with image) to improve learners' understanding of the problems and to develop their digital abilities in solving those problems as well as their academic adaptation in their field of specialization. This will enable them to solve those problems that must be solved by programming or through education and computer technologies as confirmed by many studies, including: (Vye, 1990), (Barbara, 1998), (Shyu, 2000), (Lee, 2002), (Rietg .et. al, 2003), (Kariuki & Duran, 2004), Terri L. Kurz, Ivana, 2005), (Maslovat & Chua & Lee & Franks, 2006), (Flodman, T, 2007), (Heo, 2007) (Goldberg & Elhadad, 2007), (Bottge & Rueda & Kwon & Grant & Laroque, 2009), (Matter, 2010), (Wright, 2010), (Yuh-Tyng Chen, 2012), (Hartanto & Reye, 2013), (Hartanto, 2014), (Chapman, 2014).

Chatane and Bin Lakhal (2019) assert that among the problems that the university student's faces: the low-level of self-confidence, anxiety, the difficulty to form social relationships with colleagues and

professors, in addition to the poor learning achievement or motivation towards study, the choice of specialization, lack of planning, time management and many other problems that prevent the good adaption, which means a decline in the student's mental health (p. 26).

From the above, it is clear that the research problem lies in the weakness of the academic level of a large number of students of the first and second levels in the Department of Educational Technology at the Faculty of Education, Hail University, to face real problems in their lives by teaching them good education and to learn them how to benefit from their previous information in solving programming problems related to computer courses. That was the conclusion reached by the researcher through his pilot study, which is based on the study of a number of students in the department and the fact that the researcher has worked as Head of the Department and has a direct contact with students, the method used in teaching is not concerned with the previous experiences and information of the learner.

### **3. Research Questions**

The study tries to answer the following research question:

- a. What is the impact of developing anchored learning in interactive electronic environments on modernizing the computer course teaching method of students of the Department of Educational Technology at the Faculty of Education- Hail University?
- b. What is the impact of developing anchored learning in interactive electronic environments on digital awareness of students of the Department of Educational Technology at the Faculty of Education- Hail University?
- c. What is the impact of developing anchored learning in interactive electronic environments on the academic adaption of students of the Department of Educational Technology at the Faculty of Education- Hail University?

### **4. Objectives**

The main objectives of the study are the following:

- a. Using anchored learning in interactive electronic environments in teaching the computer course for students of the Department of Educational Technology at the Faculty of Education - University of Hail.
- b. Measuring the impact of anchored learning in interactive electronic environments on the digital awareness of students of the Department of Educational Technology at the Faculty of Education - University of Hail.
- c. Measuring the impact of anchored learning in interactive electronic environments on the academic adaption of students of the Department of Educational Technology at the Faculty of Education - University of Hail.

### **5. Research Terms and Definitions**

#### **5.1 Anchored Learning:**

The study defines anchored learning as a form of education based on problem-solving. After dividing students into groups, the teacher presents, for example, video presentation, real situations, educational

projects or simulation models that contain stories or event and have an anchor (the focus of the event) through which past events are linked to current events. The students search for information from different learning sources to solve the problems they face, and then each group presenting its findings. The teacher provides feedback and assessment to his students.

## **5.2 Interactive Electronic Environments:**

In this research, interactive electronic environment is defined as an integrated and interactive system that presents the introduction to computer course in light of a specific strategy to achieve educational goals.

## **5.3 Digital Awareness:**

This research defines digital awareness or digital literacy by one's acquisition of the basic skills that enables him to use computer technologies in his daily life, whether digital devices, electronic programming or the use of the Internet in communications or scientific research, and the ability to discover and determine how to access, evaluate, and use information.

## **5.4 Academic adaptation:**

The present study defines the academic adaptation as the ability of a student to adapt to the educational environment provided to him through his previous experience and to develop satisfactory relationships with his teachers and colleagues, in addition to the change in his academic behavior in accordance with the courses received digitally.

# **6. The Importance of the Research**

The study derives its importance from:

## **6.1 Theoretical importance:**

The present research provides a theoretical study on anchored learning, its importance and steps in teaching computer and various anchored learning patterns.

## **6.2 Applied Importance:**

the current study will be useful from the applied perspective for

### **The students:**

The current study will present a digital awareness scale that would be helpful for the students in various academic stages, whether in university stage, secondary stage, or basic education. This will be through enabling the students to test their abilities and being able to digital awareness, whether in hardware or electronic programs. Besides, the current study will present also a scale for academic adaption that will be helpful for university students through enabling the students to test their academic adaption abilities in their specialization.

### **The teachers:**

anchored learning in interactive electronic environment will present various patterns that will help in increasing computer teachers' awareness in various educational levels through the change in current

teaching methods whether during the service or in the stage of preparing the teacher in colleges of education by using anchored learning in interactive electronic environment and the preparation of the lessons by it.

### **The researchers:**

presenting set of materials and research tools for the scale of digital awareness and academic adaption scales that are considered as measurement tools and could be used in other similar researches.

## **7. Research Sample**

The current study is limited to the following:

A group of students of the Department of Educational Technology at the first and second level at the Faculty of Education - Hail University.

- It is applied to the student in the first semester of the academic year 2019/ 2020.

## **8. Research Tools and Materials:**

The researcher uses the following research tools and materials:

- Blackboard e-learning platform used in the research
- Virtual classrooms used in the research
- Multimedia used within the virtual classrooms

### **8.1 Assessment tools**

- Digital awareness scale prepared by the researcher
- Academic adaption prepared by the researcher

## **9. Research Methodology**

The current study uses both the descriptive and experimental approaches. The Descriptive approach is used to determine from one hand the steps of using electronic anchored learning for teaching computer course to the Educational Technology Department students, Faculty of Education- Hail University. From the other hand, it is used to prepare the research tools as well as when applying the research tools in the field experience of the research; scales of digital awareness and academic adaption. As for the experimental approach it is used to determine the effectiveness of anchored learning.

## **10. Theoretical Framework:**

### **Anchored learning in interactive electronic environment in teaching computer course:**

According to Ruzic and O'connell (2007), anchored learning is defined as a strategy for learning and exploring the educational environment, where all scientific activities are designed about realistic situations to qualify the learners to solve the problems they could face (P. 2).

Foster (2007) defines anchored learning as a strategy for learning depends on situations for solving problems. It challenges the learner and pushes him to reach to the information and knowledge that qualifies him to solve the educational problems facing him (P. 3). Bransford (2007) illustrates that anchored learning is a learning model based on the employment of technological innovations. Also, a real and enjoyable educational context that encourages active learning by learners is created (P. 1).



Moreover, Heo (2007) highlights that anchored learning in an interactive electronic environment is fertile, collaborative, and fascinating for the students. It allows students to explore the content from various perspectives within a broader context that includes activities to solve a meaningful problem to overcome the dormant knowledge problem (Non-transferable knowledge to similar contexts).

According to Wojtowiz (2011), anchored learning in an interactive electronic environment mainly depends on placing learning within a context. It builds knowledge and skills in real-world problems that fascinates student and gives him the opportunity to do a realistic role to solve a problem; which enhances the processes of real learning (P. 3).

Several studies have confirmed the effectiveness of anchored learning, including:

Goldberg and Elhadad (2007) make an experiment to use anchored learning in developing linguistic skills. They employ anchored learning to find students who are unable to master the language, as well as to develop students' skills in choosing the proper preliminary method, and to improve accuracy in the use of language.

Bottge et al., (2009) also use anchored learning in their study. The results of the two evaluation methods used in the study indicate that students with low achievement levels benefited widely from the learning process supported by anchored learning. They were able to take the test and take the same amount of time like students who have a more advanced level.

As for Matter (2010), he tries to develop learning through anchored learning using cognitive abstraction strategies. He also presents a perception of how to use anchored learning in the field of educational technology. Furthermore, Wright (2010) presents an experiment about the use of anchored learning in teaching high school students the history of different regions of the world in multiple historical periods. The results of the experiment showed the effectiveness of using anchored learning, especially with students who find it difficult to learn, through textbooks.

Moreover, Hochholdinger and Shaper (2013) illustrate the effectiveness of the anchored learning strategy and its assessment of the mathematical problems through understanding the parts that contain dialogue and measurement. Besides, Hartanto and Reye (2013) illustrate the effectiveness of anchored learning in the Intelligent Tutoring System to help Queensland University of Technology (QUT) students in learning the C # programming language effectively, to make the learning process more enjoyable, by integrating anchored learning within an intelligent supervision system called CSTutor.

In addition to Chapman (2014) who provides an experiment of using anchored learning based on video shows to help students and teachers in a meaningful understanding of the cognitive origins of special education. The experiment is conducted on (26) students in the spring semester and (26) students in the fall semester. The results of the experiment were measured by the student's contribution to the topics of discussion on a discussion board via the web, as well as the several times the participating student log in to enrichment readings site. The results show that the activity of students in the fall semester increased by (25%) compared to students in the spring semester. This is due to the use of anchored learning in the educational process.

As for Kariuki and Duran (2014) they prove the effectiveness of using anchored learning in training the pre-service teachers on how to use technology in the courses, and restructure educational computing courses to enhance future teachers' learning to apply technology in their classroom. The research sample includes a group of (22) accredited teachers from southeastern Ohio schools.

Furthermore, Gerges (2017) proves the effectiveness of developing some performance skills and technological thinking among the first-year preparatory stage students at Al-Khayat preparatory school for girls. This is through studying the unit of scratch programming language by using participatory learning mode based on electronic anchored learning represented in video shows, interactive activities, simulation models, and instructional sites.

Besides, Goda (2017) that highlights the effect of the difference of two virtual classes' modes (simultaneous- asynchronous) supported by electronic anchored learning on developing programming skills for the first-year secondary school students.

### **Anchored Learning Modes**

According to Heo (2007), there are multiple modes of anchored learning that are used as a framework to help active learning students in understanding and formulating a complex problem by solving a set of interrelated sub-problems. These problems require recalling students' prior knowledge and employing it in a context similar to the real- world reality through which students work together cooperatively to apply problem-solving skills. These modes include video shows, authentic (real) tasks, educational activities, as well as discussion and interaction (P. 34).

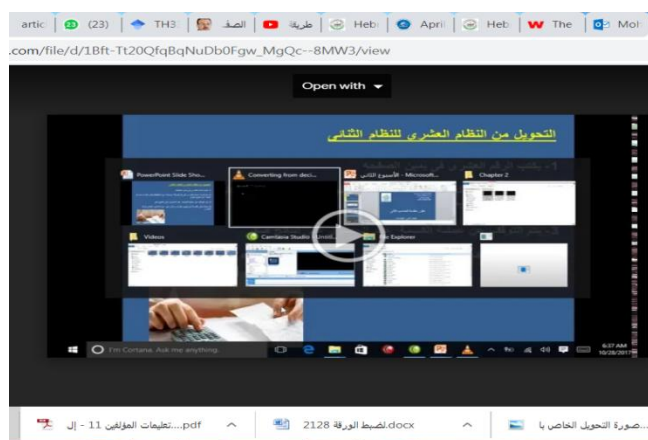
Baumbad & et al. (2005) pinpoint that anchored learning provide content in the form of an educational problem that requires the student's prior knowledge to solve it in addition to the information that is presented to him while trying to solve the problem. The main goal of anchored learning is to overcome the problem of inactive prior knowledge and to create learning environments that allow students to continue in research and learning. Moreover, it enables them to understand the various problems and to use the opportunities they face in the various fields of knowledge and information, which is considered as a tool that helps them to achieve the goal of learning. Anchored learning also aims at developing the student's imaginative abilities, which help him transfer the acquired experiences and information for different real situations (P. 18).

### **First: Video Shows**

According to Heo (2007), video shows format helps in providing students with different forms of authentic and complex learning experiences. It facilitates their understanding of the broader context. Furthermore, it is used as a central point for initiating productive thinking and different interactions. It also puts students within complex dynamic situations that enable them to experience multiple perspectives of learned concepts and develop their mental models. This helps students create flexible patterns for understanding that allow them to use their learning in real situations effectively (PP. 23- 30).

Heo (2007) illustrates that when designing a video show in anchored learning, it should be written in a narrative form. It should include a clear and specific formulation of the educational problem. The educational activities should be intertwined and integrated with the content and they should help the students in achieving the educational goal in an active and meaningful way. The video should be integrated with the educational content so that it supports the content and connects the student's prior knowledge and experiences with the new discovered knowledge. The video show allows students to see and discuss difficult situations to pass through, as it provides realistic stories and incidents. It also provides students with a rich knowledge background, using the information of that integrated (audio-visual) shows. In addition, it requires sharing experiences, and interacting in a high level of interaction to solve problems occurs. And this may increase students' ability to carry out their tasks (PP. 13-24). The researcher has designed a set of educational videos to explain the educational material through the electronic learning platform used Blackboard. The following is a picture of one of the videos designed in the research Figure (1).



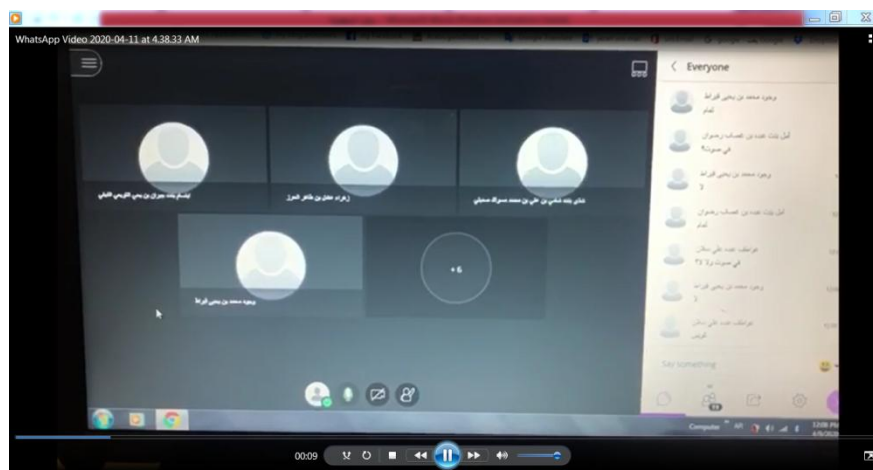


**Figure 1. Video design in the research**

Kupetz and Zigenmeyer (2005) pinpoint to the effectiveness of employing anchored learning in an integrative way. The study consists of video recordings for teaching practice, multimedia stories, note-taking tasks, meditation, reading, discussion, and real-life situation applications for learning a foreign language. It develops a student's knowledge about the practice of teaching English as a foreign language and as a tool for sharing experiences and learning.

### **Second: Real Situations**

This is done through placing the student in a real situation that leads to problem-solving, i.e. in targeted seminars and using virtual classes. It has many systems, including (Wiziq); it is a closed system in which experts and specialists can host concurrent seminars on the topic of learning, as well as through the Real time board for Education, which is one of Google concurrent open source application that allows sharing and adding multimedia files, using writing and following tools, in addition to conducting seminars using the chat rooms. This is what the researcher has made using the virtual classes included in the Blackboard e-learning platform and placing students in groups to solve some problems in the computer course according to Figure (2).



**Figure 2. using the virtual classes and placing students in groups**

First-level students during one of the educational situations which the researcher recorded for students to benefit from later

### **Third: Cooperative or Participatory Educational Projects:**

It takes place in working groups of students, where students learn in the form of cooperative and participatory groups. They implement specific projects through which the student can receive a feedback from his colleagues by cooperating or participating with them in the working groups, or receiving feedback from the teacher.

Educational projects often lead to the emergence of different learning outcomes, in addition to those that were expected considering learning as a dynamic process in which students use processes and different ways to explore the project.

The Smart Sheet application can be used in planning and organizing the collaborative or participatory project in terms of task times and student roles in the group. It also allows participation in discussions between the project working group and obtaining feedback. Besides, it is distinguished by its flexibility as it allows uploading documents and shows. The following is Figure (3) for students in a group during their cooperation with the researcher in solving one of the applications problems of conversion between the binary and decimal system in the computer.



**Figure 3. Students in a Group during their cooperation with the researcher in solving one of the applications problems**

Students in a group during their cooperation with the researcher in solving one of the applications problems of conversion between the binary and decimal system in the computer.

### **Fourth: Interactive Activities:**

Pimental & et al. (2001) indicate that the information contained in the course can be generated through activities carried out by students at different times and places, and based on information for subjects they have previously learned (P. 359).

Azmy & et al. (2014) illustrate that there are many activities that students can do in online education, such as: doing exercises, questions related to educational content, making summaries, discussions in either large or small groups, through asynchronous and synchronous communication tools, carrying out work or experiment related to educational goals and record its results individually or collectively, making audio and video recordings on topics in the curriculum and searching for information on specific topics on the Internet and writing a report about them (P.154). This is what the researcher has done during his research.

From the above, the researcher suggests steps to use electronic anchored learning in teaching computer course.

### **Steps of using electronic anchored learning in teaching computer course.**

1. Using e-learning platform that is already used by the students in Hail University, i.e. Blackboard platform;
2. Uploading the content of the experiment on the Blackboard platform that includes educational videos, educational files in PDF format and educational links on YouTube;
3. Dividing students into work groups and assigning them to solve problems in the introduction to

computer course through an interactive online discussion session on the Blackboard e-learning management system;

4. Discussing data and information among members of the same group through an educational forum on the Blackboard e-learning management system;
5. Show the groups' solutions to the problems through presenting the information;
6. Feedback and assessment.

## **11. Research Tools:**

**First:** Establishing electronic content based on anchored learning in interactive electronic environments for teaching computer courses to develop digital awareness and academic adaptation among students of the first and second levels in the Department of Educational Technologies at the College of Education, Hail University.

By referring to the main literature relevant to the subject of the research and reviewing the studies that dealt with anchored learning and the steps of teaching with this strategy. This has been done through the following:

- a. Referring to the main literature relevant to the subject of the research and reviewing the studies that dealt with anchored learning and the steps of teaching with this strategy.
- b. Reviewing some of the literature on anchored learning, digital awareness, and academic adaptation.
- c. Defining the topics of the proposed program through a set of periods, according to the topics and nature of the age group of students.

### **Determining goals for electronic content**

- a. A set of educational goals has been identified for the proposed content based on anchored learning

in teaching computer courses to develop digital awareness and academic adaptation among students

of the first and second levels in the Department of Educational Technologies at the Faculty of Education, Hail University. It is taken into account its coverage to different cognitive, emotional and skillful aspects.

- b. Preparation of the teaching content: The formulation of the proposed program content goes through the following stages:
- c. Examining many sources related to the selected topics, for which students of the research group are expected to achieve the results of the research.
- d. Linking the knowledge, skills, and values involved in each topic, to the information and educational experiences that students may have.

**Scientific control of the content:** In order to verify the availability of scientific control in the subjects of the content presented through anchored learning, the content is presented to a group of research arbitrators and specialists in the field of computers and educational technology to be guided by their views on the following points:

- a. Clarity of the objectives of the electronic content in the introduction to the computer course and to what extent it covers aspects of learning to be achieved;
- b. Integrity, accuracy, clarity, infiltration and logical scientific material contained in the study.
- c. Suitability level of educational material and activities.

In the light of the opinions of the arbitrators, the necessary adjustments are made, and the content based on anchored learning in the interactive electronic environments is now finalized.

**Second:** Preparing the digital awareness scale for students of the first and second levels in the Department of Educational Technologies at the Faculty of Education, Hail University:

The preparation process goes through the following stages:

**The First Stage:** To extrapolate some previous literature that focused on preparing the scales, mainly, the digital awareness scale. The goal of the scale is defined in the impact of the development of anchored learning in developing the digital awareness of the research group.

**The Second Stage:** To identify the dimensions of the digital awareness scale guided by previous studies and test-related writings, as the dimensions of the scale included three main dimensions (computers - programs and software - the Internet), and each dimension consists of ten phrases.

**The Third Stage:** The scale is adjusted, calculated for stability and honesty, as well as ease and difficulty parameters are calculated as follows

#### a. Validity Test

The researcher depends on the following:

### Apparent Validity:

The validity of the digital awareness scale, its comprehensiveness, and the appropriateness of its vocabulary is determined to measure the impact of using anchored learning on the development of digital awareness of the research group based on the opinions of a group of arbitrators. The guidelines submitted by the arbitrators were taken into consideration, they were modified accordingly, and the scale was finalized.

### Alpha-Cronbach Stability

The value of the alpha coefficient is calculated for the test as a whole and it reached (0.812). This is sufficient evidence that the scale has a high stability coefficient. As the scale contains three dimensions, it is found that the stability coefficients ranged between (0.628) and (0.829), all of which are high values of stability and statistically significant at level of (0.01), which means that the dimensions of the scale have high stability coefficients, and thus are valid for use, and this is clear through the following table (1):

**Table 1. Alpha-Cronbach coefficient for each dimension and the overall score of the scale**

Dimension	First	Second	Third	The overall score
Alpha	.628	.807	.829	.812

**The Fourth Stage:** The scale has been applied to a sample of (30) students of the Department of Educational Technology at the Faculty of Education, Hail University, to know the extent of the appropriateness of the scale phrases to the level of students and to calculate the suitable time to apply the scale, through calculating the average time taken by each student separately in the scale. It was found that the time taken for testing is (35) minutes, in addition to ten minutes for the instructions of the scale, that is (45) minutes.

### Third: Academic Adaption Scale

The preparation process goes through the following stage:

- **The First Stage:** To extrapolate some previous literature that focused on preparing the scales, mainly, the academic adaption scale. The goal of the scale is defined in the impact of the development of anchored learning in developing the academic adaption of the research group.

**The Second Stage:** To identify the dimensions of the academic adaption scale guided by previous studies and test-related writings, as the dimensions of the scale included thirty phrases.

**The Third Stage:** The scale is adjusted, calculated for stability and honesty, as well as ease and difficulty parameters are calculated as follows

#### a. Validity Test

The researcher depends on the following:

### Apparent Validity:

The scale is presented in its initial form to the arbitrators. They are chosen from professional professors specialized in curricula, teaching methods, and psychology in universities, in order to express their views on the validity and comprehensiveness of the phrases, in addition to the clarity of the formulation of each

phrase for students, and the possibility to amend the formulation or delete or adding new phrases, so that the scale becomes abler to achieve the goal for which it was established. This illustrates the validity of the content, in the light of the views and suggestions of the arbitrators.

### **Internal Consistency**

To check the internal consistency, the Pearson correlation coefficient is calculated between each phrase of the scale, in order to know the extent of correlation and consistency of the scale statements with the overall score of the scale, knowing that the scale statements have strong correlation and statistically significant coefficients with the overall score of the scale. This indicates that the scale with its phrases has a high internal consistency.

### **Alpha-Crunbach Stability**

The value of the alpha coefficient is calculated for the test as a whole and it reached (0.825). This is sufficient evidence that the scale has a high stability coefficient and it is valid for using.

### **The selection of the research group students**

A group of (30) students is chosen from the Department of Educational Technology, Faculty of Education- Hail University, in the first semester of the academic year 2019/2020 AD.

### **Fourth: Pre-application of the research tools:**

A scale of digital awareness and academic adaptation is applied to students of the research group before conducting the experiment, with the aim of identifying the initial level of the research group students.

Fifth: Fifth: Teaching students the electronic content prepared through anchored learning to develop digital awareness and academic adaptation among students of the first and second stage in the Department of Educational Technologies at the Faculty of Education- Hail University Hail. This will be through the following:

- a. The Blackboard e-learning platform used in the search;
- b. The virtual classrooms used in the research;
- c. Multimedia used within the virtual classes.

## **12. Research Results:**

In order to answer the second research question “What is the impact of developing anchored learning in interactive electronic environments on digital awareness of students of the Department of Educational Technology at the Faculty of Education- Hail University?”. The following steps have been followed:

- a. Monitoring the results of the students in the pre and post-application in the digital awareness scale.
- b. Conducting a statistical treatment of the digital awareness scale and using statistical analysis (the Statistical Packages for Social Sciences (SPSS) program) in order to calculate the value of “T” to measure the difference between the average scores of the students of the research group in the pre and post- applications. In addition to measuring the effect size of the independent groups by calculating the Eta squared  $\eta^2$  as shown in the following table (2):



**Table 2:** The significance of the difference between the average scores of students in the research group (pre and post-application) for the digital awareness scale and the effect size (square value  $\eta^2$ ) and the effect force (d) (n = 40)

**Table 2. Average Score of the Student**

Dimension	Application	Average	Standard Deviation	(T) Value	Significant Level	Square Value ( $\eta^2$ )	Effect Force (d)
Computer Devices	Pre-application	2.42	0.976	15.605	Significant in (0.01)	0.87	5.20
	Post-application	6.32	1.188				High
Programs and Software	Pre-application	2.74	0.724	14.132	Significant in (0.01)	0.84	4.71
	Post-application	6.37	1.478				High
Network	Pre-application	2.45	0.828	12.731	Significant in (0.01)	0.81	4.24
	Post-application	6.34	1.599				High
The whole scale	Pre-application	7.61	1.462	23.250	Significant in (0.01)	0.94	7.75
	Post-application	19.03	2.726				High

**Table 2 illustrates the following:**

When calculating the value of (T) for the digital awareness scale as a whole, it becomes clear that it is equal to (23,250) which is greater than the tabular value of (T) which is equal to (2.7) for the degree of freedom of (37) at the level of (0.01). This indicates that there is a statistically significant difference between the average scores of students in the pre and post-application of the digital awareness scale as a whole in favor of the post- application, which is a statistically significant difference at the level (0.01). This means that teaching the unit formulated according to the development of anchored learning has shown a statistically significant difference in the dimension of computer devices for the first year of the secondary school students. By calculating the size and type of effect, it is clear that the effect size has reached (0.94) and showed a high effect force of (7.75). This is an indication of the high effect size of using anchored learning in developing digital awareness among students of the research group.

The value of (T) for the programs and software dimensions is equal to (14.132) which is greater than the tabular value of (T) which is equal to (2.7) for the degree of freedom of (37) at the level of (0.01). This indicates that there is a statistically significant difference between the average scores of students in the pre and post-application of the programs and software dimensions in favor of the post- application, which is a statistically significant difference at the level (0.01). This means that teaching the unit formulated according to the development of anchored learning has shown a statistically significant difference in the programs and software dimensions for the first year of the secondary school students. By calculating the size and type of effect, it is clear that the effect size has reached (0.84) and showed a high effect force of (4.71). This is an indication of the high effect size of using anchored learning in developing digital awareness among students of the research group.

The value of (T) for the network dimension is equal to (12.731) which is greater than the tabular value of (T) which is equal to (2.7) for the degree of freedom of (37) at the level of (0.01). This indicates that there is a statistically significant difference between the average scores of students in the pre and post-application of the network dimension in favor of the post-application, which is a statistically significant

difference at the level (0.01). This means that teaching the unit formulated according to the development of anchored learning has shown a statistically significant difference in the network dimension for the first year of the secondary school students. By calculating the size and type of effect, it is clear that the effect size has reached (0.81) and showed a high effect force of (4.24). This is an indication of the high effect size of using anchored learning in developing digital awareness among students of the research group.

### To answer the third research question

“What is the impact of developing anchored learning in interactive electronic environments on the academic adaption of students of the Department of Educational Technology at the Faculty of Education-Hail University?” the researcher followed the following:

The researcher used the "T" test for two interconnected samples, and the results were as shown in the following table (3).

**Table 3:** The "T" test and its level of significance for the differences between the average scores of the experimental group in the pre and post- application for the scale of academic adaptation as well as the effect size (square value ( $\eta^2$ )) and the effect force (d) (n = 40)

**Table 3. Electronic Adoption as a whole.**

Scale	Application	Average	Standard Deviation	(T) Value	Significance Level	Eta <sup>2</sup> ( $\eta^2$ )	Effect Size (d)
Electronic adaption as a whole	Pre-application	56.90	6.03	30.34	Has a significance in	0.96	9.79
	Post-application	113.50	10.70		0.01		High

### From Table (3) it is clear the following:

There is a statistically significant difference at the level of (0.01) between the average levels of the pre and post- application of the scale of the academic adaptation in favor of post-application as (T) value has reached (30.46) for the academic adaption scale, and this value is statistically significant at the level of (0.01).

### Commentary on the Findings

- After students studied the program using anchored learning, there was growth in digital awareness and academic adaptation, and this appeared through the electronic activities that students implemented through electronic multimedia;
- Providing educational content using learning has a major impact on encouraging students to employ what they have learned, which has led to increasing self-confidence between the teacher and his students, as well as raising performance rates taking into account individual differences between students;
- After studying by using anchored learning, there was a clear impact on the development of academic adaptation of the students. This was clear through students searching for information themselves and knowing the strengths and weaknesses of their teaching methods during the study phase in order to be able to take the right scientific decisions;

- Enhance students' ability by accessing to the internet to complete the tasks required from them through the use of their digital knowledge and awareness.

### **13. Recommendations:**

In light of the results of the research, it is recommending the following:

- It is proved the impact of using anchored learning in interactive electronic environments on developing digital awareness and academic adaptation, so the research recommends using anchored learning in teaching other units of computer course, as well as in other subjects and other academic grades.
- Two scales are prepared for academic adaptation and digital awareness of the computer course, so the research recommends the use of these two scales in other educational stages.

### **14. Suggestions for Future Research**

In the light of the findings, some situations have emerged that could be topics for suggested studies and research, including:

- Using anchored learning to develop superior cognitive thinking skills and academic perseverance among students of Hail University;
- Activating anchored learning to develop systemic thinking skills for students of the Department of Educational Technology at Hail University;
- The use of anchored learning in interactive electronic environments and their impact on developing technological thinking skills among students of Hail University.

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