

# "The Impact of Multi Spaces Learning Style in Reducing The Cognitive Load for Instructional Technology Students "

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## مجلة البحوث في مجالات التربية النوعية

معرف البحث الرقمي DOI: 10.21608/JEDU.2024.211152.1881

المجلد العاشر العدد 50 . يناير 2024

التقييم الدولي

P-ISSN: 1687-3424

E- ISSN: 2735-3346

<https://jedu.journals.ekb.eg/>

موقع المجلة عبر بنك المعرفة المصري

<http://jrfse.minia.edu.eg/Hom>

موقع المجلة

العنوان: كلية التربية النوعية . جامعة المنيا . جمهورية مصر العربية





## " The Impact Of The Multi Spaces Learning Style In Reducing The Cognitive Load Of Instructional Technology Students "

### **Abstract:**

The research aimed to reveal the impact of the multi-spaces learning style in reducing the cognitive load of students of instructional technology, and the current research used the semi-experimental approach to measure the effect of the independent variable on the dependent variable among the students in the study sample. cognitive achievement, and the cognitive load scale, and the study was applied to a sample of 50 male and female students from the first-year students in the Department of Instructional Technology, The study reached several results, the most important of which are: the presence of statistically significant differences between the average scores of students in the study sample in the pre-application and the post-application of the achievement test in the study of an introduction to instructional technology in favor of the post-application. And the post application of the observation card in favor of the post application, which indicates that the size of the influence of the independent variable on the dependent variable has a significant effect; This confirms the effectiveness of the experimental treatments that were conducted on the experimental group, the research sample.

**Keywords: Multi-Spaces Learning- Cognitive Load.**

## "أثر نمط التعلم متعدد الفواصل في خفض الحمل المعرفي لدى طلاب تكنولوجيا التعليم"

المستخلص:

هدفت الدراسة إلى الكشف عن أثر نمط التعلم متعدد الفواصل في خفض الحمل المعرفي لدى طلاب تكنولوجيا التعليم، واستخدم البحث الحالي المنهج شبه التجريبي لقياس أثر المتغير المستقل على المتغير التابع لدى الطلاب عينة الدراسة، وتمثلت أدوات الدراسة في بطاقة ملاحظة أداء الطلاب عينة الدراسة، واختبار تحصيلي، ومقياس الحمل المعرفي، وطبقت الدراسة على عينة قوامها 50 طالب وطالبة من طلاب الفرقة الأولى بقسم تكنولوجيا التعليم، وتوصلت الدراسة لعدة نتائج أهمها: وجود فروق دالة إحصائية بين متوسط درجات الطلاب عينة الدراسة في التطبيق القبلي والتطبيق البعدي للاختبار التحصيلي في دراسة مادة مدخل إلى تكنولوجيا التعليم لصالح التطبيق البعدي، كما توصلت إلي وجود فروق دالة إحصائية بين متوسط درجات الطلاب عينة الدراسة في التطبيق القبلي والتطبيق البعدي لبطاقة الملاحظة لصالح التطبيق البعدي، مما يدل على أن حجم تأثير المتغير المستقل على المتغير التابع تأثير كبير؛ وهو ما يؤكد على فاعلية المعالجات التجريبية التي تم إجرائها على المجموعة التجريبية عينة البحث.

الكلمات المفتاحية: التعلم متعدد الفواصل - الحمل المعرفي.

## Introduction:

The successive rapid developments witnessed in the last three decades in various fields have had a great impact in seeking to devise new learning methods that allow learners to deal with this information momentum. Learning has become not only limited to the book, but the tools and techniques that facilitated the learning process for the learner have varied, and several electronic sources have emerged through which millions of information are broadcasted daily, such as social media, educational boards, web pages, e-mail, etc., and with these Information Boom Self-learning based on modern technologies has become the best way to deal with this information boom; This regard is what the philosophy of e-learning is based on, which is the ability of the learner to learn at any time and place, i.e. flexibility, which makes the learning process available to all and transforms the learner from a passive recipient to a positive participant interacting with this information.

Angela Bradley & Alec Patton (2018, 8) see multi-interval learning as a modern approach to parenting; Because it helps the learner to be able to store a large amount of information based on dividing the information into small parts that are easy to understand, absorb and store, and through the activities that are practiced, the information remains for longer periods stored in long-time memory, and thus it becomes difficult to forget information quickly

## Research problem and questions:

Authors from a wide range of disciplines have contributed to the reconceptualization of cognitive load and investigated the fundamentals of cognitive load. In this section, we review those reconceptualization's that have the most relevance for the field of digital learning. One interesting model is aimed at transferring insights from CLT into the field of ergonomics with an emphasis on extraneous load. In their paper, Hollender et al. (2010) present an adapted CLT model that integrates software demands into the extraneous load component. Hollender et al. (2010) propose to reformulate extraneous load as the sum of the cognitive load created through instructional design and the load stemming from software usability (such as demands posed by interfaces). This model introduces an important distinction, namely that

there may be different load types due to digital interactions that can add to the extraneous load.

The researcher derived the study problem from several sources:

### **Associated Studies:**

The study of Ramadan Heshmat (2018), which aimed to know the impact of the multi-interval e-learning pattern on the development of visual memory for students with learning difficulties.

And the study of Salwa Al-Masry, Weam Ismail (2019), which aimed to determine the most appropriate pattern of intervals (expanded - equal) in electronic spaced learning, by interacting with the level of mental capacity (high - low) for middle school students; With regard to their effect on the survival of the effect of learning, the results of the research revealed that the students who studied in the expanded pattern with mental capacity (high - low) achieved better results than those who studied in the equal pattern in reducing the cognitive load.

A similar emphasis on the need to differentiate different load components has also been formulated recently by Skulmowski and Rey (2020a) based on results from findings that showed how cognitive load surveys aimed at different types of extraneous load (e.g., verbal or software interaction-based cognitive load) can lead to variations in resulting extraneous load measurements, thus justifying the assumption of different extraneous load components. In addition to different load types, it is commonly acknowledged in the CLT literature that there can be many sources of extraneous load depending on the presentation of the task, or other affordances of the learning environment (Schnotz & Kürschner, 2007), for instance visual factors (such as split-attention resulting from a spatial separation of related Educational Psychology Review (2022) 34:171–196 175 content; Chandler & Sweller, 1992) or different instruction approaches (Sweller & Levine, 1982). This task-dependent nature of cognitive load has led to more differentiated cognitive load measurement methods. As an example, Andersen and Makransky (2020) developed a cognitive load survey specifically for virtual reality learning environments that divides extraneous load into three sub-facets: instruction, interaction, and environment (see also the simulation task load index developed by Harris et al., 2020). There were also attempts to frame the different load types as specific processes on the neural level based on research from neuro-imaging studies (Whelan, 2007). Whelan summarizes studies that vary in task difficulty to investigate the neural correlates of intrinsic load. He

concludes that intrinsic load can be regarded as “maintenance and manipulation demand placed on the prefrontal cortex” (Whelan, 2007, p. 7). Extraneous load, on the other hand, is described as a “disruption in the activation of the sensory modality-specific mechanisms that underlie attentional modulation” (Whelan, 2007, p. 7). Whelan’s (2007) conceptualization links extraneous load to perceptual demands and views the effects of intrinsic load as a burden on attention and working memory. Furthermore, Whelan summarizes that germane load is often linked to motivational processes in literature. He reviews a neuro-imaging study by Taylor and colleagues (2004) investigating the role of rewards on motivation and working memory. The overlap in brain activity found in the study supports the assumption of a connection between motivation and working memory (Taylor et al., 2004). In sum, transferred to the field of digital learning, Whelan’s (2007) reconceptualization of CLT can be interpreted as being in line with the conceptualization that extraneous load should be regarded as stemming from perceptual obstacles induced by learning materials, while germane load may be thought of as the extent to which learners are motivated to utilize their working memory resources.

### **Conference Recommendations:**

#### **Digital Transformation Conference 2018 in the Kingdom of Saudi Arabia:**

The conference aims to introduce digital transformation and clarify its importance and the constituent elements of digital transformation. The electronic conference will also present a quick presentation of some successful experiences in digital transformation, and the use of some modern strategies that help the learner’s learning to remain in the long-term memory, including fragmented learning and multi-interval learning, and how to use it in some countries of the world, and then present the existing efforts in the field of transformation. digital in the Kingdom of Saudi Arabia and clarify the role of the digital transformation unit in this field.

#### **The Third Educational Technology Conference, Kuwait, February 2023**

Unifying Gulf and Arab efforts in the areas of developing digital education, especially in the field of developing electronic interactive curricula, and using Multi-Spaces Learning modes, Artificial Intelligence, and Augmented Reality, according to international standards and specifications in this field.

### Researcher Observation:

By virtue of the researcher's work as a teacher for the practical side, assigned to the Department of Education Technology, Faculty of Specific Education, and a computer trainer; He noted the apathy and boredom of most of the students with the traditional texts and graphics without renewal, as well as the urgent desire for renewal in the ways of presenting content to them. This is to stimulate their motivation to learn, enabling them to deal with modern technologies, and enhance their ability to deal with information by investing their mental energy and cognitive abilities.

### Exploratory Study:

The researcher carried out an exploratory study to determine the reliability of the sense of the problem. This was represented in a test that was applied to a sample of (20) students from the first year of the Department of Educational Technology to determine the extent to which they can know the skills of producing educational three-dimensional animation graphics. And that is through the questions inside the test, and the results of the exploratory study came as follows:

Table (1) The results of the exploratory study for the exploratory sample

Question	Number of true answers		Number of false answers	
	count	percent	Count	percent
First	3	15%	17	75%
Second	6	30%	14	70%
Third	4	20%	16	80%
Fourth	5	25%	15	75%
Fifth	2	10%	18	90%
Sixth	5	25%	15	75%
Seventh	3	15%	17	75%
Eighths	4	20%	16	80%

### Research Problem:

The problem of the research was the need to reduce the cognitive load of the first-year students in an introduction to



educational technology course. This is done through multi-space learning in the extended pattern; Therefore, the research sought to answer the following main question:

**What is the effect of the multi-Spaces learning pattern on reducing the cognitive load of educational technology students in an introduction to educational technology course?**

### **Research Objectives:**

The present study aimed to investigate the impact of the multi-interval learning style in reducing the cognitive load of students of educational technology.

### **Research Hypotheses:**

**The importance of the current research may appear as follows:**

#### **Theoretical significance:**

- The research derives its importance from the importance of the topic it deals with (multi-spaces learning in the extended pattern - cognitive load), as these variables help to understand some learning processes and know their impact on the learner, which helps in increasing achievement and the survival of the learning effect.
- Keeping pace with the rapid and successive changes in educational technology by applying what research calls for in the field of visual perception and memory and their connection to verbal and visual coding of information, to reveal the effect of the interaction between the expanded multi-interval learning style in reducing cognitive load and employing this strategy in the educational process.

### **Research Limits:**

**The limits of the study are as follows:**

**Objective limits:** reduce the cognitive load in an introduction to educational technology subject.

**Human limits:** First year students at the Faculty of Specific Education, Department of Educational Technology.

**Spatial limits:** an e-learning environment that includes experimental treatment material to be applied to students in the Instructional Technology department.

**Time limits:** the second semester of the year 2021/2022 AD.

**Research Methodology:** The current research used the quasi-experimental approach to measure the impact of the independent variable, which is the "type of Multi spaces learning ", on the dependent variable, which is " Reducing the cognitive load in an introduction to educational technology subject" among the students in the research sample.

### **Research community and sample:**

The current research community consists of first year students, Department of Educational Technology, Faculty of Specific Education, Minia University.

### **Reasons for choosing the sample:**

- The students of the first year in the Department of Educational Technology were selected in particular for several reasons, the most important of which are: - The mental characteristics of students in this category make them able to absorb the theoretical foundations of the subject of educational technology.
- The first students in the college were chosen for their continuous attendance.
- This segment is characterized by efficiency in the use of the Internet due to the provision of tablets, smart boards and computers by the new education system for secondary schools, and the provision of Internet service in secondary schools.

**Experimental design of the research:** the current study used the semi-experimental approach to measure the effect of the independent variable represented by the multi-interval learning pattern on the dependent variable represented in reducing the cognitive load in an introduction to educational technology course for students of the automatic division of the Faculty of Specific Education, Department of Educational Technology.

### **Research Tools:**

1. **List of goals and content:** (prepared by the researcher): The list of goals and content included three general goals, under each goal a set of behavioral goals, the first goal: providing students with (the concept of educational technology, the principles of educational technology, the advantages of educational technology) Communication theories, its components and stages, the third objective: the necessity and objectives of e-learning.

**2. An achievement test in Introduction of Education Technology** (prepared by the researcher): The test included (50) questions distributed over the three main objectives, where the number (1) symbolizes the correct answer, and the number (zero) symbolizes the wrong answer, and the following was done to ensure the validity and reliability of the test:

a. **The validity of the test:**

The researcher calculated the validity of the test by presenting it to specialists from the disciplines of curricula, teaching methods, and instructional technology, which numbered (19) arbitrators, and modifications were made according to the opinions of the arbitrators, so that the tools in their final form are valid for measuring what Made to measure.

Table (1) shows the validity of the internal consistency of the achievement test (n = 20 respondents).

Phrase numbers and correlation coefficients between the score of each test question and the overall test score

number	1	2	3	4	5	6	7	8	9	10
correlation coefficient	**0.73	**0.74	**0.71	**0.66	**0.51	**0.58	**0.87	**0.67	**0.77	**0.57
number	11	12	13	14	15	16	17	18	19	20
correlation coefficient	**0.67	**0.84	**0.52	**0.71	**0.74	**0.73	**0.58	**0.78	**0.62	**0.59
number	21	22	23	24	25	26	27	28	29	30
correlation coefficient	**0.87	**0.86	**0.86	**0.59	**0.87	**0.86	**0.68	**0.86	**0.87	**0.74
number	31	32	33	34	35	36	37	38	39	40
correlation coefficient	**0.71	**0.67	**0.67	**0.77	**0.51	**0.71	**0.71	**0.56	**0.66	**0.74
number	41	42	43	44	45	46	47	48	49	50
correlation coefficient	**0.73	**0.77	**0.76	**0.70	**0.61	**0.61	**0.81	**0.66	**0.60	**0.70

(\*\*)Correlation is a significant at the (0.01) level

**It is clear from the previous table:** the correlation coefficients between the score of each of the test questions and the total score of the test ranged between (0.51: 0.87), and all of them are statistically significant correlation coefficients at significance levels (0.01); Which indicates the validity of the internal consistency of the test. B. Reliability: The stability of the test was calculated using several methods (Test-Retest method, and Cornbrash's Alpha coefficient), as shown in the following table:

Table (2): Cornbrash's alpha stability for achievement test phrases

(n = 20 respondents).

Phrase numbers and alpha stability coefficients for the scale after deleting the score of each test question and the stability of the overall test score										
<b>number</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>
correlation coefficient	0.71 1	0.73 2	0.72 0	0.73 2	0.72 6	0.72 6	0.73 6	0.73 2	0.71 5	0.74 0
<b>number</b>	<b>11</b>	<b>12</b>	<b>13</b>	<b>14</b>	<b>15</b>	<b>16</b>	<b>17</b>	<b>18</b>	<b>19</b>	<b>20</b>
correlation coefficient	0.72 1	0.73 8	0.74 0	0.73 4	0.72 5	0.72 1	0.72 5	0.72 6	0.71 5	0.74 1
<b>number</b>	<b>21</b>	<b>22</b>	<b>23</b>	<b>24</b>	<b>25</b>	<b>26</b>	<b>27</b>	<b>28</b>	<b>29</b>	<b>30</b>
correlation coefficient	0.72 9	0.75 0	0.73 0	0.72 9	0.73 1	0.73 0	0.72 6	0.72 7	0.73 7	0.72 8
<b>number</b>	<b>31</b>	<b>32</b>	<b>33</b>	<b>34</b>	<b>35</b>	<b>36</b>	<b>37</b>	<b>38</b>	<b>39</b>	<b>40</b>
correlation coefficient	0.72 0	0.73 6	0.71 5	0.72 5	0.72 4	0.72 7	0.72 0	0.71 8	0.72 1	0.72 4
<b>number</b>	<b>41</b>	<b>42</b>	<b>43</b>	<b>44</b>	<b>45</b>	<b>46</b>	<b>47</b>	<b>48</b>	<b>49</b>	<b>50</b>
correlation coefficient	0.72 8	0.73 1	0.73 6	0.72 7	0.73 3	0.72 5	0.73 3	0.72 6	0.73 5	0.72 0
<b>The stability of the overall test score</b>	0.732									

**It is clear from the results of the previous table:** that all the coefficients of alpha stability of the scale after deleting the score of each of the test questions and the stability of the total score of the achievement test was greater than 0.7; which indicates an acceptable value for the reliability of the test.

**3. Evaluation card of introduction to Education technology:** It includes (30) assessment items as No. (3) Indicates good skill performance, No. (2) Indicates average skill performance, and No. (1) Indicates that the student did not perform the skill.

a. **Calculating the validity of the card:** The researcher relied on the honesty of the arbitrators systematically, and from a statistical point of view, the self-honesty was calculated as an indicator of the validity of the card by calculating the square root of the value of the reliability coefficient of the card.

B. **Stability:** The stability of the evaluation card was calculated using Cooper's equation to calculate the number of times the arbitrators agreed in the arbitration of the card.

**4. Cognitive load scale** (at the disposal of the researcher) The researcher set the cognitive load scale to apply it to the students of the experimental group, consisting of (50) phrases that are required to be answered in a specific time to determine the extent to which the multi-interval learning style can reduce the cognitive load for teaching an introduction to education and special technology subject Students of the first year of the Department of Educational Technology.

**5. The performance evaluation card for the production skills of the MSL Environment** (prepared by the researcher): The performance note included (20) sub-skills, and (83) procedures for those skills, the performance note was divided into performance and did not lead, No. (2) Refers to the student's performance of the skill, No. (1) Indicates the student's failure to perform the skill.

(A) **Validity of the Observation Card:** The researcher relied on the honesty of the arbitrators in a systematic way, and from a statistical point of view, the self-honesty was calculated as an indicator of the validity of the card by calculating the square root of the value of the reliability coefficient of the card, and the value of honesty was (0.93), a value indicating that the observation card enjoyed honesty the appropriate.

(B) **Stability of the observation card:** The stability of the evaluation card was calculated using Cooper's equation to calculate the number of

times the arbitrators agreed in the arbitration of the card, and it was found that the average percentage of agreement among the assessors was (86.72%), which indicates the stability of the observation card and its validity for use.

**Second: Building the Experimental Processing Subject:** A learning environment based on the multi-interval learning style in reducing the cognitive load of students of educational technology (prepared by the researcher)

1. **Analysis Stage:** which includes identifying the characteristics of the learners: the researcher was keen to achieve rapprochement between the members of the research sample, as all of them are second-grade students (first and second-grade students).

2. **Design Stage:** This stage is carried out through several steps: formulating the general objectives that represent the general objective of the study, Providing First year students at the Faculty of Specific Education, Department of Education Technology, Minia University during the stages: The next stage of the stages formulating general objectives that represent the general goal of the study, providing year students at the Faculty of Education, Minia University with communication skills and producing e-learning environments and e-learning strategies.

3. **Construction phase:** This includes the preparation of the multi-interval learning environment and the media it contains (pdf text files, presentations, and video files).

4. **Implementation phase:** An introductory session was held to clarify the objective of the scientific application of experimental research, the concept of multi-interval learning, how to deal within the educational environment, the elements of the educational content, and the method of walking within the learning environment.

5. **Evaluation Stage:** The experimental treatment material was applied to an exploratory sample of the research community (20) male and female students from the secondary stage, other than the original sample, to ensure its ease of use, its relevance to the research group, and the appropriateness of the content, teaching aids and learning strategies with the sample members.

Conducting a search experiment: Conducting a search experiment

**Went through the following Steps:**

1. Selection of the research sample: The two research groups (exploratory and experimental) were chosen deliberately, as the sample of the exploratory research was (20) male and female students from secondary school, and the number of the experimental research group. (50) male and female students from the first year, Department of Education Technology, Faculty of Specific Education, Minia University.
2. The experimental survey: This step aimed at documenting the study tools, as well as the experimental treatment material by applying it to the exploratory sample and making the required modifications to the experimental treatment material.
3. an introductory session: The researcher conducted an introductory session to familiarize the students with the general objective of the program, and explain how to deal with the learning environment, and the training timeline.

#### **Research Terminology:**

**-Multi Space Learning** The researcher defines it procedurally as a modern strategy based on dividing the learning content (3D animated graphics) into small, independent, clear and specific parts (skills) that are based on presenting basic facts interspersed with periods of time, either equal or spaced, aiming at preserving information in long-term memory and representing periods Intervals Electronic activities or games that help neurons process previously presented information and recall it when needed.

**- Cognitive Load:** The current research agrees with the definition of NASA (2003, 7), Nahla Abdel Hamid (2012, 143), Marian Mansour (2014, 182), and Mostafa Hefny (2016, 17) that cognitive load is the learner's feeling of pressure or effort that falls on him. After being exposed to a task, situation, effort or problem, this burden appears in six dimensions, which are (mental requirements - physical requirements - time requirements - effort - achieved performance - feeling frustrated) in addition to the amount of information that the learner cannot know in a given time. Determined contrary to what is intended or required of him, which constitutes a burden on him.

#### **Research results and their interpretations:**

**First: Verification of the first hypothesis:** There are statistically significant differences between the average scores of the study sample students in the pre and Post-test of the achievement test in Intoduction

of Instructional technology and the MSL Environment in favor of Post-test.

Table No. (3) shows the significance of the difference between the mean scores of the study sample students in the pre- and post-test of the achievement test and the reduction of cognitive load. (n = 50 students)

Effect size	Eta Square	Significance level	"T" value	standard deviation	Average	implementation	total Score	Tool
Big	0.965	0.00	** 31.62-	1.52	10.00	Before	50	Achievement test
				1.97	22.15	After		

It is clear from the previous table: that the results of the application of the pre-test for the Introduction of Instructional technology test and the MSL Environment show a decrease in the average scores of the research group, which amounted to (10.00), which indicates the weak knowledge of the research sample of the concepts of Introduction of Instructional technology and its theoretical foundations, and their low knowledge of the concepts of the MSL Environment and its theoretical foundations. , It was also found that there was a statistically significant difference at the level (0.01) between the mean scores of the study sample students in the pre- test and the post- test of the achievement test in favor of the post- test, where the value of "t" was (31.62), and the effect size was calculated by the "eta square" coefficient. And it was found that the effect size is large, as the value of the Eta square is (0.965), which indicates that the size of the effect of the independent variable on the dependent variable is large; This confirms the effectiveness of the experimental treatments that were performed on the experimental group, the research sample. This result agrees with the study of Shafi et al. (2018); The results of the study revealed that there were statistically significant differences in the mean scores of the cardiac and posttest scores in favor of the post test.

**Second: Verification of the second hypothesis:** There are statistically significant differences between the average scores of the study sample students in the pre and post- test of the MSL Environment production evaluation card in favor of the post- test.



Table No. (4) shows the significance of the difference between the mean scores of the study sample students in the pre and posttest of the product evaluation card. (n = 50 students)

Effect size	Eta Square	Significance level	"T" value	standard deviation	Average	implementation	total Score	Tool
Big	0.991	0.00	65.43-	0.00	30.00	Before	105	Multi space learning environment
				4.18	73.25	After		

It is evident from the previous table: that there is a statistically significant difference at the level (0.01) between the average scores of the study sample students in the pre- and post- test of the MSL Environment production evaluation card in favor of the post- test, where the value of "t" was (65.43), and the size of the effect was calculated by a factor of "Eta square", and it was found that the effect size is large, as the value of Eta square is (0.991), which indicates that the size of the effect of the independent variable on the dependent variable is large; This confirms the effectiveness of the experimental treatments that were performed on the experimental group, the research sample. This result is static with the results of the study of Al-Ghamdi (2018).

**Third: Verification of the third hypothesis:** There are statistically significant differences between the mean scores of the study sample students in the pre and post- test of the observation card for the performance of the MSL Environment skills in favor of the post- test.

Table (5) The significance of the difference between the mean scores of the study sample students in the pre and posttest of the observation card for the performance of learning skills within the fixed environment (n = 50)

Effect size	Eta Square	Significance level	"T" value	standard deviation	Average	implementation	n	Tool
Big	0.986	0.00	51.85-	6.24	18.37	Before	50	MSL skills performance observation card
				8.81	96.15	After		

**It is evident from the previous:** that there are statistically significant differences at the level (0.01) between the mean scores of the study sample students in the pre and posttest of the observation card of learners' performance in favor of the posttest, where the value of "t" was (51.58), and the effect size was calculated by the coefficient " eta-square", and it was found that the effect size is large, as the value of eta-square is (0.986), which indicates that the effect size of the independent variable on the dependent variable is large; This confirms the effectiveness of the experimental treatments that were performed on the experimental group, the research sample.

### **Summary of results:**

- The results of the current research indicate that the results of the preliminary test for the achievement test in the study of the introduction to educational technology course led to a decrease in the average score of the research sample, which indicates the poor knowledge of the students of the research sample with the concepts of education and communication technology and the theoretical foundations of both, and this is due from the researcher's point of view This indicates that there are no comprehensive learning environment curricula that cover the aspects of the course taught by students.
- While the results of the post- test came to indicate the high average scores of the research sample, which indicates the effectiveness of the training program that was presented to the group after applying the pre-test, using an electronic learning environment, providing computer devices connected to the Internet, and providing instructional content in the form of presentations.
- The results also indicated a decrease in the average scores of the students of the research sample in the pre-application of the educational product evaluation card. Level (0.01) between the mean scores of the study sample students in the pre and post stages. - Examination of the educational product evaluation card in favor of the post-test. The researcher refers this to the good training of students of the research sample on communication skills and instructional design with application and students' production of some educational models within the framework of education standards. The validity of data and information, and observance of intellectual property rights.

- The results also showed that there were statistically significant differences at the level (0.01) between the mean scores of the study sample in the pre-test and the post-test of the observation card for the performance of learning skills and the post-test, which confirms the validity and correctness of the result of the previous hypothesis by providing students with the skills of producing educational design models within the framework of standards E-learning, which means that the student can produce his own educational design that contains e-learning standards and adheres to the ethics of electronic publishing.

### **Research Recommendations:**

- The need to include multi-interval learning in the curricula of the different educational stages (primary - preparatory - secondary - university) in proportion to each stage.
- Holding training workshops for education technology professionals to produce more interactive e-learning environments to enhance their technological culture and how to transfer it to students.

Training students on the skills of producing electronic learning environments. Educating students about the ethics of electronic publishing of any content on social networks.

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