



THE IMPACT OF E-LEARNING ON LEARNING OUTCOMES AT THE JORDANIAN UNIVERSITIES

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ABSTRACT

Objective: The study aims to determine the impact of e-learning on learning outcomes in the Jordanian universities, and the differences in the level of e-learning impact on learning outcomes in light of gender, specialization, years of experience, and academic rank.

Theoretical Framework: this study focus on the impact of e-learning on learning outcomes at the Jordanian universities.

Method: The study used analytical descriptive design by using a survey to achieve the study objectives, The study population consisted of all faculty members in Jordanian universities. The study sample consisted of (113) faculty members who were selected by random sampling.).

Results and Discussion: The study revealed statistically significant differences in the impact of e-learning on learning outcomes at the Jordanian universities due to specialization, in favor of humanities; due to years of experience, in favor of less than 10 years; due to academic rank, in favor of associate professor; while there was no statistically significant difference in light of gender.

Research Implications: it attempts to provide a more thorough picture about the situation of e-learning in Jordanian universities and how it may help university administrations develop their technological infrastructure to help faculty members capitalize the various advantages of e-learning as an effective tool for presenting learning materials. platforms.

Originality/Value: It also hoped that the results of this study may motivate administrators in Jordanian public and private universities to develop their own learning

Keywords: E-learning, Learning Outcomes, Jordanian Universities.

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O IMPACTO DO E-LEARNING NOS RESULTADOS DE APRENDIZAGEM NAS UNIVERSIDADES JORDANAS

RESUMO

Objetivo: O estudo visa determinar o impacto do e-learning nos resultados de aprendizagem nas universidades jordanianas, e as diferenças no nível de impacto do e-learning nos resultados de aprendizagem à luz do gênero, especialização, anos de experiência e classificação acadêmica.

Enquadramento Teórico: este estudo centra-se no impacto do e-learning nos resultados da aprendizagem nas universidades jordanianas.

Método: O estudo utilizou um desenho analítico descritivo usando uma pesquisa para atingir os objetivos do estudo. A população do estudo consistiu de todos os professores das universidades jordanianas. A amostra do estudo foi composta por (113) docentes selecionados por amostragem aleatória.).

Resultados e discussão: O estudo revelou diferenças estatisticamente significativas no impacto do e-learning nos resultados de aprendizagem nas universidades jordanianas devido à especialização, a favor das humanidades; devido aos anos de experiência, em favor de menos de 10 anos; pela classificação acadêmica, em favor de professor associado; embora não tenha havido diferença estatisticamente significativa em função do sexo.

Implicações de investigação: tenta fornecer uma imagem mais completa sobre a situação do e-learning nas universidades jordanianas e como este pode ajudar as administrações universitárias a desenvolver a sua infraestrutura tecnológica para ajudar os membros do corpo docente a capitalizar as várias vantagens do e-learning como uma ferramenta eficaz para apresentar materiais de aprendizagem. plataformas.

Originalidade/Valor: Espera-se também que os resultados deste estudo possam motivar os administradores das universidades públicas e privadas da Jordânia a desenvolverem a sua própria aprendizagem.

Palavras-chave: E-learning, Resultados de Aprendizagem, Universidades Jordanianas.

EL IMPACTO DEL E-LEARNING EN LOS RESULTADOS DEL APRENDIZAJE EN LAS UNIVERSIDADES DE JORDANIA

RESUMEN

Objetivo: El estudio tiene como objetivo determinar el impacto del aprendizaje electrónico en los resultados del aprendizaje en las universidades jordanas, y las diferencias en el nivel del impacto del aprendizaje electrónico en los resultados del aprendizaje en función del género, la especialización, los años de experiencia y el rango académico.

Marco teórico: este estudio se centra en el impacto del aprendizaje electrónico en los resultados del aprendizaje en las universidades jordanas.

Método: El estudio utilizó un diseño analítico descriptivo mediante el uso de una encuesta para lograr los objetivos del estudio. La población del estudio estuvo compuesta por todos los profesores de las universidades jordanas. La muestra del estudio estuvo compuesta por (113) miembros de la facultad que fueron seleccionados mediante muestreo aleatorio).

Resultados y discusión: El estudio reveló diferencias estadísticamente significativas en el impacto del aprendizaje electrónico en los resultados del aprendizaje en las universidades jordanas debido a la especialización, a favor de las humanidades; por años de experiencia, a favor de menos de 10 años; por rango académico, a favor de profesor asociado; mientras que no hubo diferencias estadísticamente significativas según el género.

Implicaciones de la investigación: intenta proporcionar una imagen más completa sobre la situación del aprendizaje electrónico en las universidades jordanas y cómo puede ayudar a las administraciones universitarias a desarrollar su infraestructura tecnológica para ayudar a los profesores a capitalizar las diversas ventajas del aprendizaje electrónico como una herramienta eficaz para presentar aprendiendo materiales. plataformas.



Originalidad/Valor: También se espera que los resultados de este estudio puedan motivar a los administradores de las universidades públicas y privadas de Jordania a desarrollar su propio aprendizaje.

Palabras clave: E-learning, Resultados del Aprendizaje, Universidades Jordanas.

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1 INTRODUCTION

One of the major events throughout history was the emergence of COVID-19 in the late 2019 in China which is a pandemic resulting in acute respiratory disorders. The most effective measures for was safe guarding one's life from being threatened by this pandemic is social distancing which means closing schools and business organizations; the use of face masks and imposing travel restrictions (Voo, Reis, Thomé, Ho, Tam, Kelly-Cirino and Munsaka, 2021). Cao, Fang, Hou, Han, Xu, Dong and Zheng (2020) content that this pandemic has been spreading rapidly all over the world and this means that there are necessary measures to keep peoples' lives safe from such dangerous disease. Emphasizing the hazards of COVID-19, Pan, Ojcius, Gao, Li, Pan and Pan (2020) contents that this pandemic is a major concern for public health and local governments since it has significant negative effects on the different educational and business institutions. Following the wild spread of COVID-19, many governments worldwide implemented various measures such as closing schools and universities in addition to forcing lockdowns that restrict people's mobility. In other word, people are shutting their doors on themselves since they were not allowed to go out either to work or to school leading to the transfer to distance learning which seemed to be the most appropriate solution to maintain learning and teaching to students while keeping them safe (Odriozola-e, 2020),), e-learning has emerged as a prominent contender due to its flexibility, accessibility, and potential for personalized learning experiences. The transition towards e-learning underscores the need for educators to adapt instructional strategies and leverage digital tools effectively to optimize student engagement and learning outcomes in the post-pandemic era (Handayani, 2024).

In the last few years, the transformation to E-learning has become one of the educations trend among educators worldwide. Developing and develop countries came to a conclusion that this form of learning is the future of the teaching learning process. Therefore, the educational systems in all countries have worked to take drastic and valuable steps to make E-learning the



common system to provide the learning materials to students. As such, there were enormous efforts to design curricula in a way that matches the needs, desires and interest of students that are more likely to be very interested in using technology as a tool to access the learning material delivered to them (Pham & Tran, 2020), at the same time keep the role of the education institutions to increase individuals' capabilities, enabling them to interact with and adapt to the output of these institutions (Al-Ibrahim & Daradkah, 2021), E-learning presents universities with a pioneering method of education that goes beyond geographical boundaries, improves accessibility, and promotes engaging learning interactions, thereby playing a pivotal role in evolving educational methodologies within higher education institutions. (Rivera-Mamani & others, 2024).

Affirming this fact, Bavike (2019) contends that there is a vast increase in the number of university students wishing to take E-learning media as their main source of getting their learning material from professors. In the same vein, Seaman, Alinne and Seaman (2018). Claimed that a vast majority of student are now preferring the use of technological as away to in role in university class while showing very positive attitudes toward higher education institutions willingness to provide their students with E-learning experiences able to fulfill their interests while maintaining a fruitful learning environment that may help students reach the required learning objectives set forth by the educational plan.

The effect of E-learning on students' outcomes has been extensively examine. For example, Blackmore, Tantam and Deurzen (2008), indicate that the use of E-learning may contribute in promoting students' academic achievement as it provides them with rich learning environment able to fulfill their interest and aptitude to interact with technology to obtain the learning material presented by the lectural. In the same vein, Mehrdad, Zolfaghari, Bahrani and Eybpoosh (2011), confirmed that the use of E-learning is very effective in improving students' outcomes in higher education institutions', especially in those specializations leading practical training such as medicine, nursing, engineering since faculty members may resort to virtual learning environments to teach students how to handle the different cases they may encounter in future in their career lives.

As the use of E-learning in universities has gained more attention, researchers have focused a great deal of attention on the ability of this new method to provide learning materials to students. In addition, a variety of student and faculty variables were considered when examining the use of E-learning. One of the most important student variables is the results, despite the documented positive effects of e-learning (Ter-Stepanian, 2012). A study conducted in Malaysia by Osman, Jamaludin and Fathil (2016) aimed to analyze the effects of using online



video lectures on student reaction, student engagement and learning results in a flipped classroom environment. The study was conducted with 32 students who responded to a questionnaire. Results indicated that the use of online video lectures significantly predicted learning results. The results also indicated that student interaction and student engagement did not mediate the relationship between online video lectures and learning results.

In one study by Kintu, Zhu and Kagambe (2017) aimed to define the effectiveness of blended learning on learning outcomes. The study sample consisted of (238) university students. To achieve the study objectives, a survey was used. The study found that blended learning design features (technology quality, online tools and face-to-face support) and student characteristics (attitudes and self-regulation) predicted student satisfaction as an outcome. The results also indicated that some of the student characteristics and design features are significant predictors for student learning outcomes in blended learning.

While Holmes and Reid (2017) in USA used a pretest/posttest design to examine students' learning outcomes for online learning and on-campus versions of the same course taught by the same instructor. The participants of the study included (40) master's-level counseling students, (20) students were in the online learning group and (20) students were in the on-campus group. The study revealed that groups of students scored significantly higher on the posttest than the pretest. It also revealed that there were no significant differences in performance between the two groups, and no significant difference in mean course ratings (students' learning outcomes) between the two groups.

In another study in Vietnam, Nguyen (2017) investigated the impact of e-learning activities on students' learning outcomes. The study sample consisted (68) undergraduate students, distributed into groups to perform group activities (teacher–student interaction, students–student interaction, student–content interaction and student–technology interaction), each group there were four to six members. The study used learning analytics approach to analyze the real-life data of student's interaction when the students participated in online learning activities. The results of analysis showed that students who effectively interacted with learning activities in the course have better results. Results also indicated that student–student interaction has a greater impact on students' learning outcomes.

In a study in Taiwan by Ritonga, Azmi and Sunarno (2020) tried to determine the impact of e-learning on students' learning outcomes by using a quasi-experimental research design with a sample of (64) students of sport science faculty divided into two equal groups, the experimental group taught using an e-learning system, while the control group taught using conventional method. Both groups had a test in order to determine the impact of the study



method on students' learning outcomes. The study indicated that the learning outcomes of the control group was higher than the control group, which means that there is a significant difference between the learning outcomes of both groups, in favor of the experimental group. From this, it can be stated that students who use e-learning scored higher than those who use conventional approaches in learning.

Ajayi and Ajayi(2020) studied the effect of online collaborative learning strategy in enhancing postgraduates' learning outcomes in science education. Pretest-posttest, control quasi-experimental research design was used on (38) students from two universities in south west Nigeria. The study used a questionnaire and science education performance test. The study showed that the use of online collaborative learning strategy enhances undergraduates' learning outcomes and retention in science education.

The study by Baber (2020), on the other hand, aimed to examine the determinants of students' perceived learning results and their affect on student comfortable. Data were collected through convenience sampling from 100 undergraduates in Korea and India, who were taking online courses during the pandemic COVID19 and were asked to complete a questionnaire. The results showed that factors such as classroom interaction, student motivation, course structure, instructor knowledge, and simplify had a positive impact on students' reflections of learning results and student satisfaction. No significant differences were found in the learning results and satisfaction of students in the two countries.

2 PROBLEM OF THE STUDY

Due to COVID-19 pandemic, universities worldwide were forced to provide learning experiences to students using e-learning which has become a fact no one can ignore now a days in addition to being considered the future of higher education. Therefore, despite the abundant literature examining the rule of e-learning in different sittings, there is still a need for further investigation, especially when there are some variables that are not taken into account including the psychological, social influences of such learning experiences. As Jordan has been interested in the transformation into e-learning since the educational reform conference held in Amman in 1987, there are still some pitfalls hindering the effective use of technological media in providing learning experiences to students. Additionally, there is still busty in previous studies in Jordan examining the effect of e-learning on students learning outcomes since the majority of the previous literature was performed in foreign countries. Hence, there is a theoretical gap



that this study attempts to fulfill when giving interested educators a clearer picture about the status quo of e-learning impact on Jordanian university students learning outcomes.

2.1 QUESTIONS OF THE STUDY

1. What is the impact level of E-learning on learning outcomes in Jordanian Universities?
2. Are there statistically significant differences in the impact level of E-learning on learning outcomes in Jordanian universities in light of gender, specialization, years of experience and academic rank?

2.2 SIGNIFICANCE OF THE STUDY

The importance of the study stems from the fact that it attempts to provide a more thorough picture about the situation of e-learning in Jordanian universities and how it may help university administrations develop their technological infrastructure to help faculty members capitalize the various advantages of e-learning as an effective tool for presenting learning materials. It also hoped that the results of this study may motivate administrators in Jordanian public and private universities to develop their own learning platforms.

2.3 OBJECTIVES OF THE STUDY

The study aims to determine the impact of e-learning on learning outcomes in the Jordanian universities, and the differences in the level of e-learning impact on learning outcomes in light of gender, specialization, years of experience, and academic rank.

2.4 LIMITATIONS OF THE STUDY

This study was confined to faculty members in the academic year 2020/2021 which limits the generalization of the study results. Also, the small sample size may be a major limitation in this study.



3 METHODOLOGY

3.1 DESIGN OF THE STUDY

The study used analytical descriptive design by using a survey to achieve the study objectives.

3.2 POPULATION AND SAMPLE OF THE STUDY

The study population consisted of all faculty members in Jordanian universities. The study sample consisted of (113) faculty members who were selected by random sampling. Table 1 shows the distribution of the study sample according to its variables.

Table 1

Distribution of the Study Sample According to the Study Variables

<i>Variable</i>	<i>Participation</i>	<i>Frequency</i>	<i>%</i>
<i>Gender</i>	<i>Male</i>	<i>82</i>	<i>72.6%</i>
	<i>Female</i>	<i>31</i>	<i>27.4%</i>
<i>Specialization</i>	<i>Humanities</i>	<i>64</i>	<i>56.6%</i>
	<i>Scientific</i>	<i>49</i>	<i>43.4%</i>
<i>Years of Experience</i>	<i>Less than 10 Years</i>	<i>60</i>	<i>53.1%</i>
	<i>More than 10 Years</i>	<i>53</i>	<i>46.9%</i>
<i>Academic Rank</i>	<i>Assessment Prof</i>	<i>41</i>	<i>36.3%</i>
	<i>Associate Prof</i>	<i>33</i>	<i>29.2%</i>
	<i>Prof</i>	<i>39</i>	<i>34.5%</i>
<i>Total</i>		<i>113</i>	<i>100%</i>

3.3 STUDY INSTRUMENTS

To achieve the objectives of the study, the researcher prepared a questionnaire by referring to a group of previous studies. The tool, in its initial form, consisted of (22) items distributed over (4) areas: students, teachers, course, and administration..



3.4 VALIDITY OF THE INSTRUMENT

To ensure the apparent validity of the tool, (5) experienced people were asked to express their opinions on the items included in the tool. After reviewing their comments, the tool in its final form consisted of (20) items, distributed over the areas mentioned above..

3.5 RELIABILITY OF THE STUDY

To verify the stability of the study tool, the test and retest method was used by applying the tool for the first time to a sample of (15) faculty members from the study population and from outside the original sample of the study and re-applying it. The same tool on the same sample after two weeks. The Pearson correlation was then calculated between their scores on the scale..

Furthermore, Cronbach's alpha coefficient was calculated for internal consistency reliability. Table 2 shows Cronbach's alpha for the individual domains and the total instrument. It was found that these values are appropriate to achieve the objectives of the study..

Table 2

Test-Retest, Cronbach Alpha for Individual Domains and Total Instrument

N	Domain	Cronbach Alpha
1	Students	0.87
2	Teachers	0.82
3	Course	0.84
4	Administration	0.83
	total score	0.91

4 RESULTS AND DISCUSSION OF THE STUDY

4.1 RESULTS OF THE FIRST QUESTION: WHAT IS THE IMPACT LEVEL OF E-LEARNING ON LEARNING OUTCOMES IN JORDANIAN UNIVERSITIES?

To answer the first question of the study, means and standard deviations of the impact level of E-learning on learning outcomes in Jordanian Universities were computed as presented in tables (3).



Table 3

Means and standard deviations of the impact level of E-learning on learning outcomes in Jordanian Universities ranked in a descending order

Rank	N	domain	Mean	Std. Deviation
1	4	Administration	2.89	.955
2	1	Students	2.72	.785
3	2	Teachers	2.65	.987
4	3	Course	2.46	1.026
Total			2.68	.891

Table 3 shows that "Administration" receives the highest mean (2.89) regarding the degree of agreement followed by "Students" with a mean of (2.72) while "Course" ranked last with a mean of (2.46). This table also shows that the total mean is (2.68) with a moderate level.

This result can be explained by that faculty members are overloaded with the use of e-learning in extraordinary conditions represented by COVID-19 pandemic that has heavily affected their psychological and social wellbeing. This implies that faculty members are overloaded with various responsibilities such as giving lectures in addition to designing non traditional assessment tools that they are not accustomed to. In other words, although Jordanian universities work hard to prepare and equip their faculty members to use e-learning by designing and developing professional training programs, there is nonetheless faculty members who have negative attitude towards e-learning and they were forced to employ them as a result of the breakout of COVID-19 pandemic. Furthermore, universities were not fully equipped to fully transfer to e-learning as this was a sudden transformation due to COVID-19 knowing that the full transformation to e-learning needs long planning and financial, human resources.

4.2 RESULTS OF THE SECOND QUESTION: ARE THERE STATISTICALLY SIGNIFICANT DIFFERENCES IN THE IMPACT LEVEL OF E-LEARNING ON LEARNING OUTCOMES IN JORDANIAN UNIVERSITIES IN LIGHT OF GENDER, SPECIALIZATION, YEARS OF EXPERIENCE AND ACADEMIC RANK?

To find out whether there are statistical significant differences ($\alpha=0.05$) in the impact level of E-learning on learning outcomes in Jordanian universities in according to gender, specialization, years of experience and academic rank, t-test analysis was conducted for gender, specialization and years of experience variables while One way ANOVA was conducted for academic rank variable and the results are shown in tables 4.



4.2.1 Gender

Table 4

T-Test Results in Gender variable

	Gender	N	Mean	Std. Deviation	t	Sig.
Students	Male	82	2.76	.811	.840	.403
	Female	31	2.62	.714		
Teachers	Male	82	2.74	1.014	1.570	.119
	Female	31	2.42	.886		
Course	Male	82	2.54	1.040	1.334	.185
	Female	31	2.25	.973		
Administration	Male	82	2.95	.972	1.080	.282
	Female	31	2.73	.904		
Total	Male	82	2.75	.911	1.292	.199
	Female	31	2.50	.826		

Table 4 shows that there are no statistically significant differences at ($\alpha = 0.05$) in due to Gender in all variables. This result mirrors a significant fact which is that both males and females share the same organizational and professional experiences and they participate in the same level in different professional development programs. Additionally, this result implies that both males and females faculty members possess same technological competence skills while experiencing at the same time similar daily life events.

4.2.2 Specialization

Table 5

T-test results due Specialization variable

	Specialization	N	Mean	Std. Deviation	t	Sig.
Students	Humanities	64	2.89	.842	2.656	.009
	Scientific	49	2.50	.648		
Teachers	Humanities	64	2.88	1.065	2.918	.004
	Scientific	49	2.36	.790		
Course	Humanities	64	2.69	1.079	2.772	.007
	Scientific	49	2.16	.876		
Administration	Humanities	64	3.11	1.012	2.928	.004
	Scientific	49	2.60	.793		
Total	Humanities	64	2.89	.964	2.986	.003
	Scientific	49	2.40	.704		

Table 5 shows there are statistically significant differences at ($\alpha = 0.05$) due to Specialization in all variables in favor of Humanities. This result clarifies a major fact that human specializations can be delivered using e-learning or distance learning tools since the



nature of such specializations do not need practice and drills at the faculty. By contrast scientific specializations must see and observe the faculty members performing a certain task so can the student learn such skill. Additionally, scientific specialization needs the presence of certain equipments at university labs so as the students can learn by hand-on activities and this is not the case for human specialization which only needs students reading the text book and discussing some points with faculty members.

4.2.3 Years of Experience variable

Table 5

T-test results due Years of Experience variable

	Years of Experience	N	Mean	Std. Deviation	t	Sig.
Students	Less than 10 Years	60	2.92	.765	2.922	.004
	More than 10 Years	53	2.50	.754		
Teachers	Less than 10 Years	60	2.87	1.033	2.523	.013
	More than 10 Years	53	2.41	.880		
Course	Less than 10 Years	60	2.71	1.058	2.800	.006
	More than 10 Years	53	2.18	.920		
Administration	Less than 10 Years	60	3.18	.977	3.616	.000
	More than 10 Years	53	2.56	.820		
Total	Less than 10 Years	60	2.92	.909	3.123	.002
	More than 10 Years	53	2.41	.797		

Table 5 shows there are statistically significant differences at ($\alpha = 0.05$) due to years of experience in all variables in favor of less than 10 years. As the use of e-learning tools means to have excellent computer skills, faculty members with less than years of experience are supposed to be younger compared with other faculty members who haven't been exposed to technology since a while as teaching in the past was traditional and not technology based; meaning that they lack the adequate computer skills helping them in delivering students effective learning experiences. Contrary to that faculty members with less than years of experience were heavily engaged in using technology since they were young students, thus, they can capitalize the various applications in providing students with rich learning context.



4.2.4 Academic Rank

Table 5

One way ANOVA results due Academic Rank variable?

		N	Mean	Std. Deviation	F	Sig.
Students	Assistant Prof	41	2.58	.645	11.416	.000
	Associate Prof	33	3.22	.839		
	Prof	39	2.45	.688		
	Total	113	2.72	.785		
Teachers	Assistant Prof	41	2.43	.793	11.571	.000
	Associate Prof	33	3.29	1.067		
	Prof	39	2.35	.867		
	Total	113	2.65	.987		
Course	Assistant Prof	41	2.30	.859	7.752	.001
	Associate Prof	33	3.01	1.127		
	Prof	39	2.16	.933		
	Total	113	2.46	1.026		
Administration	Assistant Prof	41	2.73	.797	9.076	.000
	Associate Prof	33	3.44	1.072		
	Prof	39	2.59	.818		
	Total	113	2.89	.955		
Total	Assistant Prof	41	2.51	.724	11.008	.000
	Associate Prof	33	3.24	.982		
	Prof	39	2.39	.765		
	Total	113	2.68	.891		

Table 5 shows there are statistically significant differences at ($\alpha = 0.05$) due to academic rank in all variables. Post hoc using Sheffee method for pair wise multiple comparison was calculated as in table 5.

Table 6

Post hoc results using Sheffee method for pair wise multiple comparison

		Mean	Assistant Prof	Associate Prof	Prof
Students	Assistant Prof	2.58			
	Associate Prof	3.22	.64*		
	Prof	2.45	.12	.77*	
Teachers	Assistant Prof	2.43			
	Associate Prof	3.29	.86*		
	Prof	2.35	.08	.94*	
Course	Assistant Prof	2.30			
	Associate Prof	3.01	.71*		
	Prof	2.16	.13	.85*	
Administration	Assistant Prof	2.73			
	Associate Prof	3.44	.71*		
	Prof	2.59	.14	.85*	
Total	Assistant Prof	2.51			
	Associate Prof	3.24	.73*		
	Prof	2.39	.12	.85*	



Table 7 shows there are statistically significant differences at ($\alpha = 0.05$) between associate professor from one side and between assistant professor and full professor from the other side in favor of associate professor. This result means that associate professors are at appropriate level of experience that may motivate them to employ e-learning. Furthermore, such faculty members may have a more awareness level of the impact of using e-learning as a tool for providing students with learning experiences. This may influence their attitudes positively about their proneness to resort to e-learning on learning experiences.

RECOMMENDATIONS

In light of the results, the study suggests:

- Developing training programs aiming to change faculty members' attitudes and practices related to e-learning to raise the impact of e-learning on students' outcomes.
- Calling universities administration to invest in professional development programs targeting promoting faculty members' computer literacy skills.
- Future research may examine the impact of e-learning on different variables such as learning experience satisfaction among students.

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