

PAPER

Receptivity Level of Faculty Members in Universities Using Digital Learning Tools: A UTAUT Perspective

Fadi Bani Ahmad¹, Sabah
Jamil Al-Nawaiseh¹(✉),
Asmaa Jameel Al-Nawaiseh²

¹Middle East University,
Amman, Jordan

²Mu'tah University,
Mu'tah, Jordan

snawaisseh@meu.edu.jo

ABSTRACT

The research investigates the degree of receptivity level of faculty members in Jordanian universities using digital learning tools from a UTAUT perspective. To achieve the research objectives, the descriptive-analytical approach is used. The research sample consists of (387) faculty members selected by the purposeful random method. An electronic questionnaire is developed as a research instrument, and its validity and reliability are checked. The results show that the unified theory of acceptance and usage of technology's conceptions and the use of digital learning are both highly significant. (UTAUT). The findings also show a strong positive and medium correlation among the constructs: performance expectations, effort expectations, and social influences and receptivity level. Besides, the results demonstrate a positive and weak correlation between the facilitating conditions construct and the degree of receptivity. The research recommends working on creating conditions that enhance the use of artificial intelligence in Jordanian public and private universities.

KEYWORDS

digital learning, theory (UTAUT), acceptance of technology, faculty members

1 INTRODUCTION

The huge progress and development in the field of information and communication technology (ICT) contribute to the emergence of various techniques and methods supported by multimedia technology with all its various components. Multimedia technology depends on using technological innovations to improve the educational learning process in a better way through the receptivity of faculty members in higher education institutions to adopt the integration of technology in the learning process through important educational learning theories in general and the unified theory of acceptance and use of technology (UTAUT) in particular.

Digital learning applications (DLA) are now one of the most important applications in society that are deeply related to human life and a key factor on which

Ahmad, F.B., Al-Nawaiseh, S.J., Al-Nawaiseh, A.J. (2023). Receptivity Level of Faculty Members in Universities Using Digital Learning Tools: A UTAUT Perspective. *International Journal of Emerging Technologies in Learning (IJET)*, 18(13), pp. 209–219. <https://doi.org/10.3991/ijet.v18i13.39763>

Article submitted 2023-03-21. Resubmitted 2023-04-25. Final acceptance 2023-04-26. Final version published as submitted by the authors.

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the technology industry is based. Numerous smart technologies based on artificial intelligence (AI) have emerged that outperform the limit in their production and effectiveness to adapt them in the service and development of the educational process. Technology receptivity, behavioral use intentions, and patterns of usage behavior among individuals are among the biggest challenges faced by educational institutions [11].

Technology receptivity is defined as the demonstrated willingness within a group of users to use information technology for the tasks for which it was developed and designed to support [17]. Developing the unified theory of acceptance and use of technology (UTAUT) is represented by the theory of justification of the action (TJA), the technology acceptance model (TAM), the motivation model (MM), the planned behavior theory (PBT), the computer use model (CUM), the theory of diffusion of innovations (TDI), and the social cognitive theory (SCT) [6]. With a close introduction to the development in the field of information and communication technology (ICT), multimedia technology, and the unified theory of acceptance and use of technology (UTAUT), the related research and studies are provided in the following part.

2 LITERATURE REVIEW

Digital learning is within computer science and aims to innovate and design smart computer systems that simulate the human intelligence method itself so that these systems can perform tasks instead of humans [10], [2] believes that artificial intelligence is one of the main pillars on which computing devices or technologies, in general, are based. Along with digital learning, technology devices are characterized by the ability to perform many tasks similar to human resources tasks, such as driving cars, recognizing images, distinguishing voices, and talking robots.

[15] assert that digital learning is the ability of a machine to simulate the human mind by interpreting the data it receives from its environment, learning from it, and using this data and information to complete tasks even in the most unexpected and novel scenarios. Digital learning has numerous advantages, such as reasoning, which gives students the ability to think, comprehend, access, and use information in new situations to make the appropriate decision to address the mental processes within the human mind.

Artificial intelligence systems also possess a large base of knowledge that enables them to link between cases and results, as these systems can separate this base from the processing systems that use, process, and interpret knowledge. Therefore, the representation of knowledge depends on a base of data, information, details, broad facts, processing systems, and how to deal with this data and information and benefit from it to the fullest. [5] Emphasizes the development of the cognitive aspects of students through digital learning applications and tools, leading to the improvement of educational learning outcomes in the student achievement test.

In terms of research on the use of digital learning in teaching [3] investigated the behavioral intention to use mobile learning among consumers using an expanded version of the unified theory of acceptance and use of technology (UTAUT) model. The study incorporated various factors such as perceived enjoyment, mobile self-efficacy, satisfaction, trust, perception, and risk brokers. The research was conducted through a cross-sectional study, using a descriptive survey method to gather data from 1562 participants via an online questionnaire. The findings suggest that behavioral intention is positively influenced by satisfaction, confidence, performance expectancy, effort expectancy, and perceived enjoyment. Additionally, effort expectancy

had a positive correlation with behavioral intention, while self-sufficiency had a significant and positive effect on perceived enjoyment. However, perceived risk had a significantly negative effect on the relationship between performance expectancy and behavioral intention. These results support the UTAUT model and offer practical guidance for educational institutions and decision-makers involved in designing mobile learning for implementation in universities.

Among the researchers who confirmed the effectiveness of digital learning in developing the learning skills of learners and bridging the digital gap, especially the study [8] which the results found that the intelligent digital learning platform to enhance digital health literacy.

Another study [14] aimed to analyze the factors affecting usage behavior by examining the factors of performance expectancy, effort expectancy, social influence, and facilitating conditions, with behavioral intentions serving as a mediating variable. The research employed a quantitative research approach and collected data from 201 male and female students using a questionnaire. The findings indicate that performance expectancy, social influence, facilitating conditions, and behavioral intentions influence usage behavior. The direct effect test revealed that performance expectancy, social influence, and facilitating conditions impact usage behavior, while effort expectancy does not. The indirect effect test showed that behavioral intentions mediate the relationship between performance expectancy and social influence but do not moderate the relationship between effort expectancy and usage behavior.

On a parallel line, [16] aim to identify the direct and indirect effects of the four determinants of technology dependence on students' behavioral intention and the actual use of e-learning in higher education institutions in the United Arab Emirates. To achieve the research objectives, the descriptive analytical approach is adopted. The research sample consists of (406) male and female students selected from the Higher Colleges of Technology in the United Arab Emirates. The data is analyzed using the partial least squares structural equation modeling (PLS-SEM). The findings indicate that performance expectancy, effort expectancy, social influence, and facilitating conditions positively affect students' behavioral intention to use e-learning. The results also show that students' behavioral intention to use e-learning mediates the relationship between the four dimensions of technology receptivity and students' actual use of e-learning. The results demonstrate that the facilitating conditions negatively affected students' actual use of e-learning. Accordingly, this is an indication that operational and technical resources including the required knowledge and skills are available to successfully use the system. This does not translate directly into the actual use of the system especially if these resources are not tailored to the age and previous experience of the students.

In the same vein, related research by [1] aims at identifying the factors affecting teacher acceptance of the use of LEGO sets in education in light of the unified theory of acceptance and use of technology (UTAUT). It also assesses whether there is a relationship between performance life expectancy, effort life expectancy, social influence, facilitating conditions, and the intention of Faculty of Computer and Science teachers to use LEGO sets in education. To achieve the research objectives, the quantitative approach is adopted. An online questionnaire based on UTAUT survey tools is developed to collect data. The research sample consists of (116) computer and science teachers in Jordan. The results indicate that the model can predict 60% of the variance in the intention to use Lego sets in education. The results also reveal that life performance expectancy and effort expectancy are consistently significant, as life performance expectancy and effort expectancy are indicators and have the

greatest effect. Having reviewed the research and studies related to the degree of receptivity level of faculty members in Jordanian universities using digital learning tools from a UTAUT perspective, the research problem is given in the next part.

3 RESEARCH PROBLEM

The work environment and clear observation show a low degree of receptivity by faculty members in universities to use digital learning applications and tools for several reasons such as the difficulty of deviating from the norm and stereotypes in education, the fear of using modern technologies, the weakness of technological capabilities, and the difficulty of providing their tools ideally. Against this, a study [13] recommends using artificial intelligence in universities in the academic field. Another related study by [7] focuses on many aspects such as students' willingness to use this technology and peers' appreciation of other teachers.

[4] Recommend the necessity of training teachers and qualifying them for the skills of modern technology. In the same area [12] Recommend the necessity of expanding the use of artificial intelligence applications and tools in education in light of the receptivity of both teachers and learners, adopting the unified theory of acceptance and use of technology (UTAUT) to make decisions to employ different educational technologies, developing the infrastructure, and providing the necessary resources to utilize artificial intelligence applications and tools in education. Accordingly, the research problem rests in investigating the degree of receptivity level of faculty members in Jordanian universities using digital learning tools from a UTAUT perspective.

4 RESEARCH QUESTIONS

Given the research problem, the research questions are:

1. What is the degree of receptivity of the faculty members for the use of digital learning applications in the teaching process from the perspective of the unified theory of acceptance and use of technology (UTAUT)?
2. Is there a statistically significant correlation between performance expectancy, effort expectancy, social influence, facilitating conditions, and the degree of receptivity of the faculty members to use artificial intelligence applications from the perspective of the unified theory of acceptance and use of technology (UTAUT)?

5 RESEARCH OBJECTIVES

The following research objectives are articulated to answer the research questions.

1. Investigate the degree of receptivity of the faculty members for the use of digital learning applications in the teaching process from the perspective of the unified theory of acceptance and use of technology (UTAUT).

2. Find out if there is a statistically significant correlation between performance expectancy, effort expectancy, social influence, facilitating conditions, and the degree of receptivity of the faculty members to use artificial intelligence applications from the perspective of the unified theory of acceptance and use of technology (UTAUT).

6 SIGNIFICANCE OF THE RESEARCH

The importance of this research lies in the growing utilization of digital learning tools and applications in higher education, as well as the pivotal role that faculty members play in enhancing and modernizing the educational process. The study's findings may provide valuable insights for decision-makers at the Ministry of Higher Education and Scientific Research and its associated institutions in terms of developing initiatives to train and prepare university faculty members to incorporate digital learning applications effectively into their teaching methodologies.

7 METHOD

7.1 Research approach

The descriptive-analytical approach is used to answer the research questions and achieve the research objectives.

Research population & sample. The research population consists of all faculty members in public universities, which are the University of Jordan, Hashemite University, and Yarmouk University, and some private universities, namely: Middle East University, Private Applied Sciences, and Jerash University. With a random sample drawn, the sample consists of 270 faculty members from universities, and the number of responses returned is 250 responses.

Research instrument validity & reliability. Answering the research questions and achieving the research objectives necessitates developing a questionnaire to collect primary data in light of the research variables directed to faculty members using the previous research and studies. To check the research instrument, it is validated in its initial form by a group of validators, and the validators' comments and suggestions are taken into account. To assess the reliability of the research instrument, the degree of consistency among the items of the research instrument and its ability to measure the desired variables is verified by finding (Cronbach Alpha). The values of the internal consistency coefficient have ranged between (0.914) and (0.946), and the alpha value for the instrument items as a whole is (0.902). Accordingly, all values are greater than the accepted standard for reliability of (0.70), and this confirms the consistency among the items of the research instrument.

8 FINDINGS & DISCUSSION

8.1 Findings related to the first question

1. What is the degree of receptivity of the faculty members for the use of digital learning applications in the teaching process from the perspective of the unified theory of acceptance and use of technology (UTAUT)?

To answer this question, the means and standard deviations for the research sample's answers about the faculty members' receptivity level to using digital learning applications are calculated as shown in Table 1.

Table 1. Description of faculty members' receptivity to the use of digital learning applications

No.	Text of Item	Mean	SD	Rank	Relative Sig.
1	I intend to use digital learning applications in the teaching process.	4.31	0.704	1	High
2	I intend to use digital learning applications to organize my information.	4.27	0.686	2	High
3	I plan to use digital learning applications in the future.	4.25	0.742	3	High
4	I have the desire to use digital learning applications in my work at the university.	4.19	0.747	4	High
5	I provide students with information related to academic subjects through digital learning applications.	3.90	0.863	6	High
6	I use digital assessment applications to evaluate students' academic performance.	3.75	0.971	8	High
7	I adopt the smart response method in responding to students' inquiries.	3.76	1.013	7	High
8	I use digital means to explain some educational topics to students in teaching courses.	4.19	0.822	5	High
	I use digital learning applications as a whole.	4.07	0.581		High

Table 1 shows the high relative significance of the use of digital learning, as the general mean is (4.07) and the standard deviation is (0.581). The values of the mean for the dimensions of digital learning have ranged between (3.75) and (4.31), with a high relative significance for all items. The item stipulating "I intend to use digital learning applications in the teaching process" is ranked first with a mean of (4.31) and a standard deviation of (0.704), while the item stipulating "I use digital assessment applications to evaluate students' academic performance" is ranked last with a mean of (3.75) and a standard deviation (0.971).

The research findings reveal a high level of receptivity by faculty members of the use of digital learning applications in the teaching process, as they have the intention to use digital learning applications in the teaching process, organize their information, plan for the use of digital learning applications in the future, and use electronic means in explaining some educational topics to students in teaching materials. Regarding the unified theory of acceptance and use of technology (UTAUT), the findings indicate that it will raise the level of performance expectancy by activating

digital learning applications in the teaching-learning process in universities. Digital learning applications also play a major role in obtaining accurate information with less effort and work to provide joint services between students and faculty members in the field of digital education.

On the other hand, this finding may be attributed to the realization of faculty members that performance expectancy is one of the strong determinants of behavioral intent and actual behaviors, creating their intention to use digital learning applications. This result may be because the use of this theory helps in explaining the variation in students' response to learning methods and strategies based on employing technology, and thus taking appropriate actions by students in the educational process. Moreover, this finding is thanks to the fact that the use of digital learning applications in the teaching process from the viewpoint of the unified theory of acceptance and use of technology (UTAUT) adds several facilities that enable faculty members to design a stimulating educational environment and provide the latest systems, programs, and applications related to digital learning applications for all university affiliates.

Furthermore, this result agreed with [9] study (2017) demonstrating that the use of the unified theory of acceptance and use of technology (UTAUT) when using instant messaging applications for users depends on faster communication and ease of use. It also agreed with the study by [12] indicating that teachers have a high degree of receptivity to the use of digital learning in education and that each of performance expectancy, effort expectancy, social influence, and facilitating conditions positively affects the intention to use digital learning in education. It also disagreed with the research results of [14] showing that performance expectancy, social influence, and facilitating conditions affect usage behavior, while effort expectancy does not affect usage behavior. The indirect effect test also shows that behavioral intentions succeed in mediating the performance expectancy and social influence, and does not succeed in mitigating the effort expectation toward the usage behavior.

8.2 Findings related to the second question

2. Is there a statistically significant correlation between performance expectancy, effort expectancy, social influence, facilitating conditions, and the degree of receptivity of the faculty members to use artificial intelligence applications from the perspective of the unified theory of acceptance and use of technology (UTAUT)?

To answer this question, analytical statistics are used by exploring the existence of a correlation between the constructs of the unified theory of acceptance and use of technology (UTAUT) and the degree of receptivity. To achieve this, the analytical statistics methods represented by the Chi-square test are used to study the independence between two phenomena and Spearman's rank correlation coefficient to identify the nature and strength of this correlation. A chi-square test is also conducted to explore the existence of a relationship between the constructs of the unified theory of acceptance and use of technology (UTAUT) and the degree of receptivity. Table 2 illustrates those results.

Table 2. Results of the Chi-square Test between the Constructs of the Unified Theory of Acceptance and Use of Technology (UTAUT) and the Degree of Receptivity

Construct	Chi-Square Value	Significance Level
Performance Expectancy and Degree of Receptivity	346.267	0.00
Effort Expectancy and Degree of Receptivity	203.999	0.00
Social influence and Degree of Receptivity	173.133	0.00
Facilitating Conditions and Degree of Receptivity	93.924	0.00

As shown in Table 2, the level of significance for the Chi-square test is equal to zero in all constructs and is less than 0.05, indicating that there is a statistically significant correlation between the constructs of the unified theory of acceptance and use of technology (UTAUT) and the degree of receptivity. To determine the direction and strength of this relationship, the Spearman correlation coefficient is used. Table 3 illustrates those results:

Table 3. Results of the Spearman Correlation Coefficient between the Constructs of the Unified Theory of Acceptance and Use of Technology (UTAUT) and the Degree of Receptivity

Construct	Spearman Correlation Coefficient Value	Significance Level
Performance Expectancy and Degree of Receptivity	0.5292	0.00
Effort Expectancy and Degree of Receptivity	0.472	0.00
Social influence and Degree of Receptivity	0.457	0.00
Facilitating Conditions and Degree of Receptivity	0.379	0.00

As shown in Table 3, there is a strong positive and medium correlation between the constructs (performance expectancy, effort expectancy, and social influence) with the degree of receptivity, while the correlation is positive and weak between the construct of facilitating conditions and the degree of receptivity. In the summary of Tables 2 and 3, it is evident that there is a strong positive and medium correlation between the constructs of the unified theory of acceptance and use of technology (UTAUT) and the degree of receptivity at the level of significance of 0.05. This result may be attributed to individuals' belief that technologies and applications improve their performance through their factors, namely performance expectancy, effort expectancy, social influence, facilitating conditions, behavioral intentions, and usage behavior. Therefore, UTAUT provides a valuable tool that enables university decision-makers, faculty, and designers to understand the factors driving the receptivity of the e-learning system and thus facilitate the adoption of the system by students. Moreover, this finding is thanks to the use of the unified theory of acceptance and use of technology as a basic reference for codifying strategic plans aimed at activating the use of technology tools in the educational process. The results of investigating the receptivity and use of technology by faculty members in the light of this theory also direct decision-makers in educational institutions to develop effective policies in planning, implementing, evaluating, and developing professional preparation and development programs to ensure maximum benefit from technology with the least amount of challenges.

The findings are consistent with the results of two previous studies. Firstly, the study conducted by [12]. Indicates that the intention to use artificial intelligence in

education is positively influenced by performance expectancy, effort expectancy, social influence, and facilitating conditions. Secondly, the results of [3] study demonstrate that satisfaction and confidence, perceived enjoyment, performance expectancy, and effort expectancy have a positive impact on behavioral intention and are significantly correlated with it.

9 CONCLUSION

In a nutshell, the research investigates the degree of receptivity level of faculty members in Jordanian universities using digital learning tools from a UTAUT perspective. The findings indicate a highly relative significance of the use of digital learning tools and the constructs of the unified theory of acceptance and use of technology (UTAUT). The findings also show a strong positive and medium correlation among the constructs: performance expectancy, effort expectancy, and social influence with the degree of receptivity. Besides, the results demonstrate a positive and weak correlation between the facilitating conditions construct and the degree of receptivity. The research recommends working on creating conditions that enhance the use of artificial intelligence in Jordanian public and private universities.

10 RECOMMENDATIONS

Given previous findings & discussion, the research recommends working to create conditions that enhance the use of artificial intelligence in Jordanian public and private universities, using some applications of artificial intelligence in the educational process, such as smart education systems, and increasing the interest of Jordanian universities in providing available facilities and using them in activating the role of artificial intelligence.

Acknowledgements: The author is grateful to the Middle East University, Amman, Jordan for the financial support granted to cover the publication fee of this research article.

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12 AUTHORS

Fadi Bani Ahmad, Middle East University, Faculty of Arts and Educational Sciences, Education technology department, Head of the Department of Education Technology and Associate Professor of Education Technology, ORCID no: [0000-0001-7984-6401](https://orcid.org/0000-0001-7984-6401), Fodah@meu.edu.jo.

Sabah Jamil Al-Nawaiseh, Middle East University, Faculty of Arts and Educational Sciences, Education technology department, Assistant Professor of Education Technology, ORCID no: [0000-0003-2983-1222](https://orcid.org/0000-0003-2983-1222), snawaiseh@meu.edu.jo.

Asmaa Jameel Al-Nawaiseh, Mu'tah University, Department of Software Engineering, Faculty of Information Technology, Mu'tah University, Mu'tah 61710, Karak, Jordan and ORCID no: [0000-0001-7105-3466](https://orcid.org/0000-0001-7105-3466), asma@mutah.edu.jo.