

Understanding E-Learning Adoption in Higher Education: A TAM-Based Study at Saida University

بجامعة سعيدة (TAM) فهم تبني التعلّم الإلكتروني في التعليم العالي: دراسة قائمة على نموذج قبول التكنولوجيا

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Abstract:

The rapid integration of digital technologies in higher education has increased interest in understanding the factors influencing students' acceptance of e-learning systems. This study applies the Technology Acceptance Model (TAM) to examine the determinants of e-learning adoption among students at Saida University, Algeria. The proposed framework focuses on perceived ease of use, perceived usefulness, and attitude toward use as key predictors of behavioral intention. Data were collected from 110 students at the Faculty of Science and Technology.

The study employed factor analysis and stepwise regression to test the relationships among the variables. The findings reveal that perceived ease of use, perceived usefulness, and attitude toward use significantly affect students' intention to adopt e-learning platforms. The results also indicate that e-learning complements traditional classroom teaching by improving interaction and learning flexibility. These findings provide practical implications for university decision-makers and educational technology developers aiming to enhance e-learning implementation in higher education institutions.

Keywords: E-learning; Technology Acceptance Model (TAM); Perceived Ease of Use; Perceived Usefulness; Behavioral Intention.

JEL Classification Codes: A22 , C25, D83

ملخص:

يشهد قطاع التعليم العالي تزايداً ملحوظاً في استخدام التقنيات الرقمية، مما أدى إلى تنامي الاهتمام بدراسة العوامل المؤثرة في تقبل الطلبة لأنظمة التعلّم الإلكتروني. تهدف هذه الدراسة إلى تحليل محددات تبني التعلّم الإلكتروني لدى طلبة جامعة سعيدة بالاعتماد على نموذج قبول التكنولوجيا (TAM)، من خلال التركيز على متغيرات سهولة الاستخدام المدركة، والمنفعة المدركة، والاتجاه نحو الاستخدام كعوامل مفسّرة للنية السلوكية. وقد شملت الدراسة عينة مكوّنة من 110 طالباً من كلية العلوم والتكنولوجيا.

اعتمدت الدراسة على التحليل العاملي والانحدار المتدرج لاختبار العلاقات بين المتغيرات. وأظهرت النتائج وجود تأثير معنوي لكل من سهولة الاستخدام المدركة، والمنفعة المدركة، والاتجاه نحو الاستخدام على نية الطلبة في استخدام منصات التعلّم الإلكتروني. كما بيّنت الدراسة أن التعلّم الإلكتروني يُعد مكمّلاً للتعليم التقليدي من خلال تعزيز التفاعل والمرونة التعليمية. كلمات مفتاحية: التعلّم الإلكتروني، نموذج قبول التكنولوجيا، سهولة الاستخدام المدركة، المنفعة المدركة، النية السلوكية.

تصنيفات JEL: A22 , C25, D83

1. Introduction

The increasing integration of Information and Communication Technology (ICT) in education has significantly transformed teaching and learning practices across the globe. ICT tools are no longer limited to administrative purposes but are now deeply embedded in the core of pedagogical processes, contributing to improved learning quality, greater accessibility, and enhanced cost-efficiency (Bhattarai, 2020) . Among the most notable outcomes of this digital transformation is e-learning, which has gained considerable traction in higher education, especially in developing countries such as Algeria. Fueled by the widespread availability of internet technologies, e-learning is increasingly seen not as a replacement, but as a complement to traditional classroom instruction. It enables more interactive and flexible communication between students and instructors, thereby challenging the conventional banking model of education, in which the teacher is the sole source of knowledge.

Despite its growing adoption, the effective implementation of e-learning remains a considerable challenge. Various studies have reported high failure rates, inconsistent student satisfaction, and several obstacles related to instructional design, teacher-student interaction, and learner engagement (Ibrahim R. L., 2017). These challenges underscore the importance of understanding the factors that shape students' willingness to adopt and use e-learning systems effectively.

In this context, the Technology Acceptance Model (TAM), developed by Davis (1986, 1989), offers a robust theoretical framework for examining user acceptance of new technologies. According to TAM, two key constructs are Perceived Ease of Use (PEOU) and Perceived Usefulness (PU). These constructs play a central role in determining users' attitudes toward a technology, which in turn influence their Behavioral Intention to Use (BIU) it. The model has been widely applied in educational research and has demonstrated strong predictive power in understanding students' adoption of e-learning platforms.

The present study applies TAM to examine e-learning acceptance among students at the Faculty of Science and Technology, Saida University. Specifically, the research pursues three main objectives: (1) to assess students' willingness to adopt e-learning as an integral component of their academic experience; (2) to identify the key TAM constructs PU and PEOU that influence their attitudes and behavioral intentions; and (3) to contribute to the body of literature by empirically applying the TAM framework within the context of Algerian higher education, with a particular focus on Saida University.

By developing a TAM based model adapted to the e-learning environment, this study aims to offer insights into students' perceptions, inform the design of more user-centered online learning systems, and provide practical recommendations for enhancing the effectiveness of e-learning implementation in Algerian universities.

2. Review of Literature

2.1 PERCEIVED EASE OF USE (PEOU)

Perceived ease of use (PEOU), defined by Davis (1989) as the belief that a system is free of effort, plays a pivotal role in shaping students' attitudes toward online learning. Research consistently supports the impact of PEOU on students' acceptance and motivation to use e-learning platforms. Taat and Francis (Taata, 2020) found that ease of use significantly influences students' positive attitudes, particularly when platforms offer accessible and well-organized materials. Similarly, (Nguyen, 2022) demonstrated that PEOU not only affects behavioral intention directly but also enhances perceived usefulness. However, some students, as noted by Lazim (Lazim, 2021), may still perceive online learning as difficult, which negatively impacts their willingness to engage. These findings underscore the need for user-friendly designs to encourage broader acceptance of e-learning technologies.

2.2 PERCEIVED USEFULNESS (PU)

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Perceived usefulness (PU), as defined by Davis (1989), refers to the extent to which an individual believes that using a system will enhance their performance. In e-learning contexts, PU has been shown to significantly impact students' intention to use online platforms. Studies have demonstrated a strong link between PU and both attitude toward use and behavioral intention. For instance, (Nguyen, 2022) found that students are more likely to adopt e-learning if they perceive it as beneficial for academic achievement. Additionally, perceived ease of use (PEOU) often influences PU, reinforcing its effect.

However, research by (Lazim, 2021) revealed that not all students view online learning as useful, which can negatively impact their willingness to engage. These mixed findings highlight the importance of designing platforms that clearly demonstrate their academic value and usability.

2.3 ATTITUDE TOWARDS USE (ATU)

Attitude toward use (ATU) reflects an individual's overall evaluation of using e-learning technologies and is considered a central element in influencing the adoption of such systems. As emphasized in TAM, PU and PEOU shape this attitude, which in turn affects behavioral intention. Research shows that students with more online learning experience tend to form more positive attitudes, increasing their likelihood of adoption (Nguyen, 2022). Prior research has also shown that positive attitudes encourage experimentation with new learning methods.

Nevertheless, findings are not always consistent. Some students, particularly

those lacking support or working with complex content, exhibit less favorable attitudes, which reduces their likelihood of acceptance (Lazim, 2021). This indicates that although attitude is critical, it may not always translate into actual use, especially in the absence of sufficient instructional support.

2.4. BEHAVIORAL INTENTION TO USE (BIU)

Behavioral intention to use (BIU) represents students' willingness to adopt and use e-learning technologies. According to TAM, BIU is directly influenced by perceived usefulness (PU), perceived ease of use (PEOU), and attitude toward use (ATU). Research shows that when students view online platforms as beneficial and easy to use, they are more likely to develop a strong intention to use them. (Nguyen, 2022) confirmed that PU and PEOU influence BIU primarily through their effect on attitude. This highlights the importance of ensuring usability and relevance to promote long-term engagement with e-learning systems.

2.5. Technology Acceptance Model (TAM)

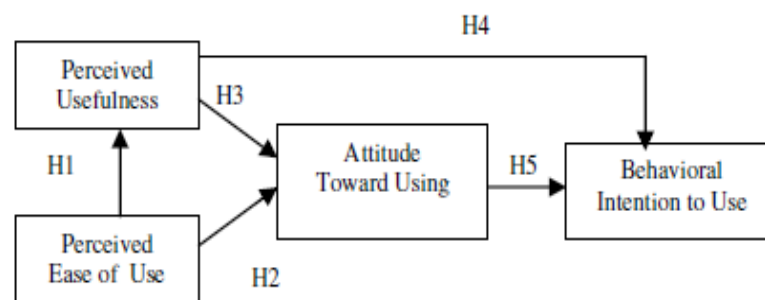
The Technology Acceptance Model (TAM), introduced by Davis (1986, 1989), explains how users accept and use technology based on two main perceptions : perceived usefulness (PU) and perceived ease of use (PEOU). These perceptions shape users' attitudes and behavioral intentions, which ultimately determine actual technology adoption (Davis F. D., 1989) ; (Bhattarai, 2020) .

TAM has been effectively applied in various technological and educational contexts. Research shows that PU and PEOU significantly influence students' willingness to continue using e-learning platforms (Ibrahim R. L., 2017) ; (Purnamasari, 2014) . During the COVID-19 pandemic, PU, PEOU, and attitude were also found to positively affect students' intention to use online learning (Sukendro, 2020).

Furthermore, TAM has been used to assess the impact of social media on e-learning adoption in Libya, where PU and PEOU of social networks significantly influenced users' behavioral intentions (Bhattarai, 2020). As noted by (Nguyen, 2022), the model's clarity and predictive ability make it especially valuable in the field of higher education.

Conceptual framework and hypothese development

Fig.01: Conceptual Framework



Source: Developed by the researchers based on previous studies.

Accordingly, and based on the TAM model applied to the context of e-learning systems, the research hypotheses are formulated as follows:

H1: Perceived ease of use significantly influences the perceived usefulness of the e-learning system.

H2: Perceived ease of use has a significant impact on the user's attitude toward using the system.

H3: Perceived usefulness significantly affects the user's attitude toward using the system.

H4: Perceived usefulness has a direct and significant effect on the intention to use the system.

H5: The user's attitude toward using the system significantly influences their intention to use it.

3. Research Methodology

3.1 Sample

A structured survey was administered to students from the Faculty of Science and Technology at the University of Technology of Saida, Algeria, with the objective of assessing the applicability of the Technology Acceptance Model (TAM) in the context of e-learning adoption. The university initiated the implementation of its e-learning system in 2020, primarily to support academic staff in the delivery of educational content. Through the platform, instructors are able to upload course syllabi, lecture schedules, and learning materials, which are accessible exclusively to registered students thus functioning in a controlled intranet-like environment.

For this study, students enrolled in a database course were selected as the target population. The sample included 110 diploma-level students who had prior experience using the e-learning platform for academic purposes. Participants were asked to complete a one-page questionnaire comprising items measured on a five-point Likert scale, ranging from "strongly disagree" (1) to "strongly agree" (5). The measurement items were adapted from the original validated scales developed by Davis (Davis, 1989, p. 320), which assess key TAM constructs such as perceived ease of use and perceived usefulness.

In addition to the core TAM items, demographic information—namely age and gender—was collected to serve as potential control variables in the analysis. A total of 110 valid responses were obtained, resulting in a response rate of approximately 9.47%. Descriptive statistics revealed that the majority of participants were digitally literate, spending more than 8 hours per week online. Additionally, 61.8% of respondents were female, and the participants' ages ranged between 20 and 30 years.

3.2 Measures

Measurement validity, including both reliability and construct validity, was thoroughly assessed in this study. To evaluate the internal consistency of the measurement items

associated with each construct, a reliability analysis was performed. According to existing literature, Cronbach's alpha values ranging between 0.6 and 0.7 are considered the minimum acceptable threshold for reliability (Hair, 2010). Values exceeding 0.7 are generally interpreted as indicating a high degree of internal homogeneity, suggesting that the items consistently measure the same underlying construct.

As shown in Table 1, the Cronbach's alpha coefficients for all constructs exceeded 0.80, which is considered very good and indicative of strong internal consistency. These results provide evidence that the questionnaire employed in this study is a reliable instrument for measuring the variables under investigation.

Table 01: Cronbach's alpha (Reliability)

Scale	Cronbach's alpha
Perceived ease of use	0.842
Perceived usefulness	0.875
Attitude towards using	0.845
Intention to use	0.854

Source: Prepared by researcher based on the outputs of SPSS 26.

To assess the construct validity of the measurement model, an exploratory factor analysis (EFA) was conducted using principal component analysis (PCA) with Varimax rotation, which is a commonly recommended method to identify the underlying structure of survey items (Hair, 2010). This analysis was applied to the 15 items of the TAM-based questionnaire, which were theoretically designed to represent four latent constructs : perceived ease of use, perceived usefulness, attitude toward using, and behavioral intention to use.

A four-factor solution was specified in accordance with the theoretical framework. After rotation, the first factor explained 51.107% of the total variance, followed by the second factor with 7.402%, the third with 5.193%, and the fourth with 5.105%. These results suggest an acceptable level of construct differentiation, supporting the factorial validity of the scale.

Table 2 presents the factor loadings after rotation, with all loadings below **0.60** excluded for clarity, in line with standard psychometric practices. (Field, 2013)

Table 02: Factor loadings for the rotated factors

Factor Loading

Scale Item	1	2	3	4
USE1	0,723			
USE2	0,619			
USE3	0,750			
USE4	0,730			
USE5	0,740			
EASE1		0,713		
EASE2		0,734		
EASE3		0,696		
EASE5		0,672		
ITU1			0,690	
ITU2			0,607	
ITU3			0,703	
ITU4			0,707	
ITU5			0,621	
ATT1				0,751
ATT2				0,704
ATT3				0,820
ATT4				0,812
% of variance explained	51.107	7.402	5.193	5.105
Cumulative percentages	51.107	58.509	63.702	68.807

Principal axis factoring was used with varimax rotation and Kaiser normalization, N = 110

Factor 1 = Perceived usefulness; Factor 2 = Perceived ease of use; Factor 3 = Intention to use;

Factor 4 = Attitude toward using

Source: Prepared by researcher based on the outputs of SPSS 26.

All factor loadings met or exceeded the commonly accepted threshold of 0.60, indicating satisfactory convergent validity (Kline, 2015). This outcome suggests that each construct is unidimensional, with its items strongly correlated and loading on a single latent factor. Furthermore, the results support the discriminant validity of the constructs, as each set of indicators loads distinctly onto its respective factor, confirming the factorial independence of the constructs.

4. Results and Discussion

The research model depicted in Figure 3 was tested using IBM SPSS Statistics version 26. As a preliminary step, a Pearson correlation analysis was conducted to explore the relationship between the demographic variables (age and gender) and the two dependent constructs : attitude toward using and behavioral intention to use. The analysis revealed no statistically significant correlations, suggesting that these

demographic variables had no meaningful effect on the dependent variables. Therefore, age and gender were excluded from further analysis, which aligns with prior studies that advocate the removal of non-significant control variables to enhance model parsimony (Pallant, 2020) (Hair, 2010).

To test the hypothesized relationships, separate linear regression analyses were performed on data collected from 110 valid survey responses. Specifically, to examine Hypothesis 1 (H1), perceived ease of use was modeled as the independent variable, and perceived usefulness as the dependent variable. Linear regression is a widely accepted method for testing direct relationships between continuous variables in behavioral and social science research (Kline, 2015). The output of the regression analysis is presented in Table 3.

Table 03: Regression results for H1

	β	Standard Error of β	t	p	R2
Perceived ease of use	0.648	0.082	7.864	0.000	0.366

Source: Prepared by researcher based on the outputs of SPSS 26.

As shown in Table 3, the regression analysis demonstrated that perceived ease of use had a statistically significant and positive influence on perceived usefulness ($\beta = 0.648$, $p < 0.001$), thereby confirming Hypothesis 1 (H1). This finding is consistent with prior research suggesting that systems perceived as easy to use are more likely to be viewed as useful by users (Davis, 1989) (Venkatesh, 2000).

To examine Hypotheses 2 (H2) and 3 (H3), a multiple linear regression was conducted, where both perceived ease of use and perceived usefulness were treated as independent variables, while attitude toward using the e-learning system was the dependent variable. The results, presented in Table 4, indicate the extent to which each predictor contributes to shaping students' attitudes. This approach aligns with established TAM-based studies that emphasize the mediating role of user attitudes in predicting behavioral intentions (Venkatesh V. M., 2003) (Kline, 2015).

Table 04: Regression results for H2 and H3

	β	Standard Error of β	t	p	R2
Perceived ease of use	0.155	0.069	2.262	0.026	0.735
Perceived usefulness	0.781	0.064	12.177	0.000	

Source: Prepared by researcher based on the outputs of SPSS 26.

As shown in Table 4, both perceived ease of use and perceived usefulness exhibited a significant positive influence on attitude toward using the e-learning system. These results provide empirical support for both Hypothesis 2 (H2) and Hypothesis 3 (H3), and are consistent with earlier TAM-based research that identifies these two constructs as strong predictors of user attitude (Davis, 1989) (Venkatesh V. &., 2000).

To evaluate Hypothesis 4 (H4) and Hypothesis 5 (H5), a third regression analysis was

conducted in which perceived usefulness and attitude toward using were included as predictor variables of behavioral intention to use. To assess both the direct and indirect effects of perceived usefulness, particularly its effect mediated through user attitude, a stepwise regression approach was employed.

In step one, perceived usefulness was entered into the model. In step two, attitude toward using was added, allowing for a clearer understanding of the mediating role of attitude in the relationship between perceived usefulness and intention to use. The findings, presented in Table 5, provide statistical support for both H4 and H5. These results are consistent with previous studies grounded in the original and extended Technology Acceptance Model (TAM) (Venkatesh V. M., 2003) (Kline, 2015).

Table 05: Regression results for H4 and H5

	β	Standard Error of β	t	p	R2
Perceived usefulness	0.422	0.115	3.655	0.000	0.647
Attitude toward using	0.449	0.113	3.973	0.000	

Source: Prepared by researcher based on the outputs of SPSS 26.

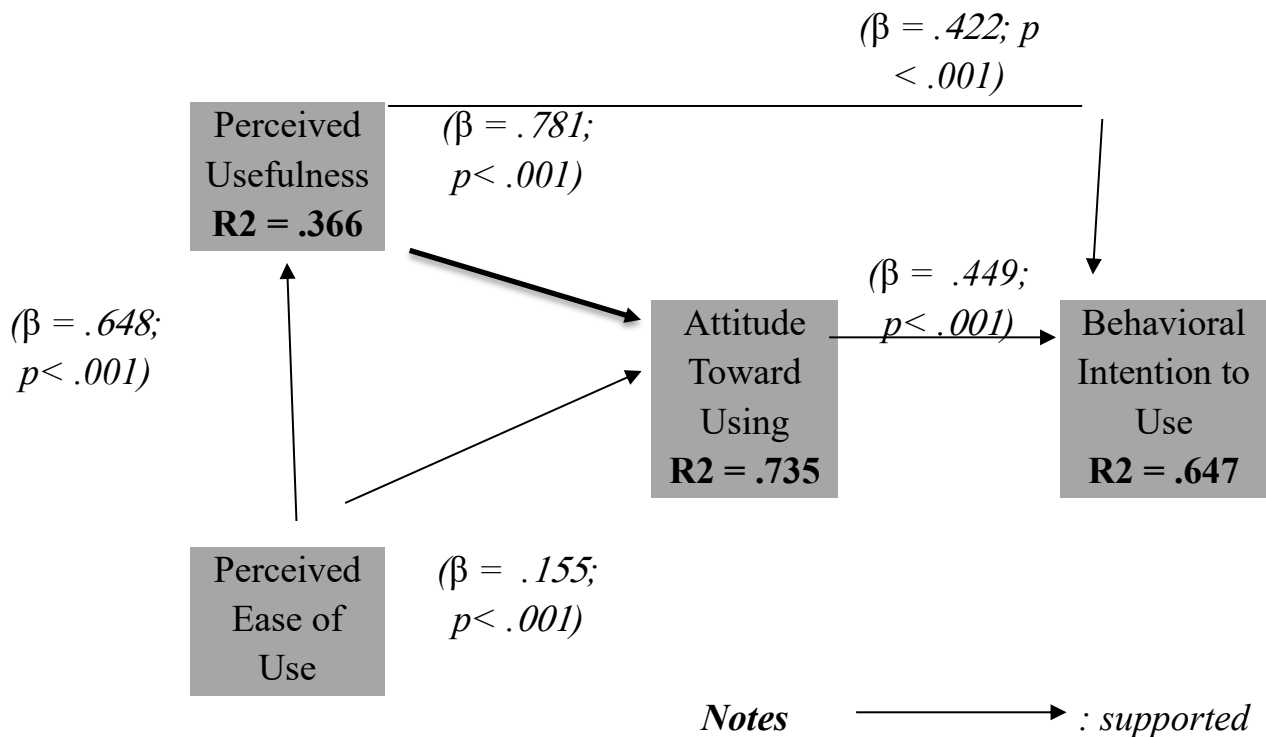
In line with previous studies (Al-Rahmi, 2019) (Šumak, 2011), perceived usefulness was found to have a statistically significant and positive effect on students' intention to use the e-learning system ($p < 0.001$). Together, perceived usefulness and attitude toward using explained approximately 39.9% of the variance in behavioral intention. Notably, both perceived usefulness and attitude toward using were significant predictors of intention to use, indicating that students' evaluations of system utility, as well as their personal disposition toward its use, influence their behavioral intentions. Accordingly, both Hypothesis 4 (H4) and Hypothesis 5 (H5) were supported by the data.

Table 06 summarizes the results of the hypotheses testing, and Figure 4 shows these results

Table 06: Summary of hypotheses testing

Hypothesis	Relationship tested	Results
H1	Perceived ease of use has a significant effect on the perceived usefulness of the system.	Supported ($p < 0.001$)
H2	Perceived ease of use has a significant effect on attitude towards using.	Supported ($p < 0.001$)
H3	Perceived usefulness has a significant effect on attitude towards using.	Supported ($p < 0.001$)
H4	Perceived usefulness has a significant effect on intention to use.	Supported ($p < 0.001$)
H5	Attitude towards using has a significant effect on intention to use.	Supported ($p < 0.001$)

Source: Prepared by researcher based on the outputs of SPSS 26

Fig.02: Results of regression analyses

Source: Prepared by researcher based on the outputs of SPSS 26.

5. Discussion

This study aimed to investigate the applicability of the Technology Acceptance Model (TAM) in explaining students' acceptance and usage intentions toward e-learning technologies. Drawing on data from 110 undergraduate students, the findings offer partial but meaningful support for the model.

The results confirmed that perceived usefulness plays a critical role in shaping behavioral intention to use, aligning with prior research that emphasizes its centrality in technology acceptance (Al-Rahmi, 2019) (Šumak, 2011). Notably, both perceived usefulness and attitude toward using were found to significantly predict students' intention to use, thereby supporting Hypotheses H4 and H5. These results highlight that students are primarily motivated to adopt e-learning platforms when they perceive them as useful and when they hold favorable attitudes toward their use.

Moreover, both perceived ease of use and perceived usefulness had significant effects on students' attitude toward using the system, reinforcing the causal relationships proposed in the original TAM framework. However, the relative influence of perceived usefulness on intention was more pronounced than that of attitude, suggesting that students may prioritize instrumental value over affective response when deciding whether to engage with e-learning platforms.

One interpretation of these results is that students tend to adopt technologies they perceive as functionally beneficial, especially in contexts where educational continuity and accessibility are at stake. This implies the need for institutions to focus on

improving system design, perceived relevance, and user training, as these aspects enhance students' recognition of the system's value.

Although the TAM proved useful in explaining several aspects of technology acceptance in this context, its ability to fully capture the formation of attitudes and behavioral intentions among university students appears to be limited. This limitation may stem from contextual or cultural differences, or from the evolving nature of digital learning environments which may not be entirely accounted for in the traditional TAM framework. As such, future research might benefit from integrating additional variables such as social influence, self-efficacy, or facilitating conditions to enhance the explanatory power of the model in higher education settings.

6. Conclusion

This research explored the relevance of the Technology Acceptance Model (TAM) in the context of students' adoption of e-learning technologies in higher education. Based on empirical data from 110 students at the University of Saida, the study provided insights into how core TAM constructs relate to students' intention to use such systems.

A key finding is the central role of perceived usefulness in shaping behavioral intention, confirming that students are more likely to adopt technologies when they clearly understand their educational value. In contrast, while attitude toward using the technology was positively associated with intention, it held comparatively less weight in influencing students' decisions. This suggests that when promoting e-learning, efforts should prioritize demonstrating the system's impact on learning effectiveness rather than focusing solely on user satisfaction or system familiarity.

The study also confirms TAM's utility as a predictive tool, even though it does not diagnose technical or contextual issues directly. However, the absence of actual usage behavior in the model represents a limitation. Future investigations are encouraged to incorporate actual system use to better capture the full trajectory from intention to adoption.

Furthermore, expanding the model by including additional factors such as students' prior experience with digital tools, frequency of use, or specific learning needs could enhance its explanatory capacity. As Davis (Davis F. D., 1993) noted, enriching the TAM framework with user-centric variables allows for a deeper understanding of technology acceptance in complex educational settings.

5. Bibliography List :

Books

- [1] Field, A. (2013). *Discovering statistics using IBM SPSS statistics (4th ed.)*, (London, UK): Sage Publications.
- [2] Hair, J. F. (2010). *Multivariate data analysis (7th ed.)*. Upper Saddle River, New Jersey, USA: Pearson Prentice Hall.
- [3] Kline, R. B. (2015). *Principles and practice of structural equation modeling (4th ed.)*. New York, USA: The Guilford Press.
- [4] Pallant, J. (2020). *SPSS survival manual: A step by step guide to data analysis using IBM SPSS (7th ed.)*. UK: McGraw-Hill Education.

Journal Articles

- [5] Al-Rahmi, W. M. (2019). Exploring the factors affecting the use of online learning among students in higher education. *Education and Information Technologies*, 24(1), <https://doi.org/10.1007/s10639-018-9810-1>, 885–900.
- [6] Bhattarai, S. &. (2020). Determining the Factors Affecting on Digital Learning Adoption among the Students in Kathman du Valley: An Application of Technology Acceptance Model (TAM), <https://doi.org/10.31033/ijemr.10.3.20>. *International Journal of Engineering and Management Research*, 10(3), 131-141.
- [7] Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 13(3), <https://doi.org/10.2307/249008>, 319–340.
- [8] Davis, F. D. (1993). User acceptance of information technology: System characteristics, user perceptions and behavioral impacts. *International Journal of Man-Machine Studies*, 38(3), <https://doi.org/10.1006/imms.1993.1022>, 475–487.
- [9]
- [10] Ibrahim, R. L. (2017). E-learning acceptance based on technology acceptance model (TAM). *Journal of Fundamental and Applied Sciences*, 9(4S), <https://doi.org/10.4314/jfas.v9i>, 871–889.
- [11] Ibrahim, R. L. (2017). E-learning continuance intention among Malaysian students. *International Journal of Advanced Computer Science and Applications*, 8(4), 169–177.
- [12] Lazim, C. S. (2021). Application of Technology Acceptance Model (TAM) towards online learning during COVID-19 pandemic: Accounting students' perspective. *International Journal of Business, Economics and Law*, Vol. 24, Issue 1, 13-20.
- [13] Nguyen, V. K. (2022). Assessing student's Adoption of E learning: An integration of TAM and TPB framework. *Journal of Information Technology Education: Research* 21, 297–335.
- [14] Purnamasari, R. &. (2014). Students' continuance intention to use e-learning: Evidence from Indonesia. *International Journal of E-Education, E-Business, E-Management and E-Learning*, 4(2), 108-112.
- [15] Sukendro, S. H. (2020). Using an extended TAM to evaluate user acceptance of e-learning during COVID-19. *Journal of Educational Technology & Online Learning*, 3(1), 22-30.
- [16] Šumak, B. H. (2011). A meta-analysis of e-learning technology acceptance: The role of user types and e-learning technology types. *Computers in Human Behavior*, 27(6), <https://doi.org/10.1016/j.chb.2011.08.005>, 2067–2077.
- [17] Taat, M. &. (2020). Factors influencing the students' acceptance of e-learning at teacher education institute: An exploratory study in Malaysia. *International Journal of Higher Education*, 9(1), 133–141.
- [18] Venkatesh, V. &. (2000). A theoretical extension of the Technology Acceptance Model: Four longitudinal field studies. *Management Science*, 46(2), <https://doi.org/10.1287/mnsc.46.2.186.11926>, 186–204.
- [19] Venkatesh, V. M. (2003). User acceptance of information technology: Toward a unified view. *MIS Quarterly*, 27(3), <https://doi.org/10.2307/30036540>, 425–478.