

Systematic Literature Review of Technology Acceptance Models in Learning Management Systems (LMSs)

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The integration of Learning Management Systems (LMSs) into educational settings is becoming increasingly common, especially in the digital field. Understanding the factors influencing the acceptance and effective use of LMS is essential to ensure successful implementation. The Technology Acceptance Model (TAM) has been widely used to check user acceptance of various technologies, including LMS. This study conducted a systematic literature review (SLR) to analyze existing research on the application of TAM in the context of LMS. A comprehensive search of the academic database was conducted to identify relevant studies published in 2010-2025. The review synthesizes findings related to the core constructs of TAM—Perceived Usability, Perceived Ease of Use, Behavioral Intent, and Actual Use—as well as extended factors such as system quality, self-efficacy, and social influence. The results reveal circumstantial evidence supporting the predictive power of TAM in LMS adoption, while also highlighting emerging trends and gaps in the literature. This review contributes to a deeper understanding of user acceptance in a digital learning environment and provides recommendations for future research and practical LMS implementation strategies.

Keywords: Technology Acceptance Model, E-Learning Management System, systematic literature review

Introduction

The rapid integration of technology into education has significantly changed the teaching and learning process. Among these innovations, Learning Management Systems (LMSs) have emerged as an essential platform, facilitating content delivery, communication, assessment, and student engagement in traditional and online learning environments (Hussein, 2017). Despite widespread adoption, the successful implementation and continued use of LMS are highly dependent on user acceptance, so it's important to understand the factors that influence the adoption of technology in educational settings.

To address this, researchers have used various Technology Acceptance Models (TAMs) and related theoretical frameworks—such as the original Technology Acceptance Model (TAM), Unified Technology Acceptance and Use Theory (UTAUT), and its expanded version—to examine the determinants of LMS adoption and use (Richard, 2010; Oktaria, Naibaho, Muda, & Kesuma, 2024). The model provides structured insights into user behavior by identifying key constructs such as Perceived Usability, Perceived Ease of Use, Behavioral Intent, and facilitation conditions.

However, a growing body of literature on LMS acceptance is diverse and fragmented, often applying

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different models, constructions, and methodological approaches (Alharbi & Drew, 2014). This variability poses challenges for researchers and practitioners seeking to identify consistent findings and best practices.

This research aims to systematically review and synthesize the existing literature on technology acceleration models applied in the context of LMS. By conducting a systematic literature review (SLR), we seek to:

1. Identify the most commonly used acceptance models and theoretical frameworks in LMS research;
2. Highlight the construction and key factors influencing LMS adoption and usage;
3. Analyze trends, gaps, and future research directions in this domain.

Through this review, we aim to provide a comprehensive understanding of how Technology Acceptance Models have been used in LMS research and offer recommendations for future studies and practical implementation in educational technology.

Literature Review

Implementation of an E-Learning System is an adoption carried out by an individual or group. The successful implementation of an E-Learning System is defined as the extent to which the system is able to achieve learning goals effectively, efficiently, and sustainably (Hussein, 2017). Adoption occurs when an institution or individual decides to start using the E-Learning System (Ahmed & Saidu, 2022).

Previous research has used the dependent variable of E-Learning System adoption to explain the implementation of the E-Learning System which is usually based on three theories, namely Diffusion of Innovation Theory (DIT), Technology Acceptance Model (TAM), and Unified Theory of Acceptance and Use of the Technology (UTAUT) (Hussein, 2017).

The acceptance of information technology is the main requirement for the successful implementation of information technology (Holden & Karsh, 2010); if the experience of using the E-Learning System makes users feel high and appropriate benefits, then users tend to be loyal to the implementation of the E-Learning System (Alharbi & Drew, 2014).

Methodology

This study adopts a systematic literature review (SLR) approach to examine the application and evolution of the Technology Acceptance Model (TAM) in the context of Learning Management Systems (LMSs). This methodology is designed to ensure a transparent, replicable, and comprehensive process of identification, selection, and analysis of relevant studies. By synthesizing empirical and theoretical research from diverse educational settings, this review aims to provide a deeper understanding of how TAM has been used to assess user acceptance of LMS platforms. Furthermore, this study seeks to identify recurrent patterns, key influencing factors, methodological trends, and potential gaps in the existing literature. The results of this review are expected to inform future research directions and support the development of more effective and user-centric LMS implementations.

Results and Discussion

Results

The findings of this systematic literature review provide a comprehensive overview of how the Technology Acceptance Model (TAM) has been implemented in the context of Learning Management Systems (LMSs) over the past decade. From the initial set of studies, 20 relevant publications were selected, ranging from 2010 to 2025.

These studies are carefully analyzed to uncover key themes, methodological trends, and theoretical advances.

Open time, there has been a noticeable increase in the number of publications discussing TAMs in LMS, especially in 2011, 2014, and 2017. According to Du, Hashim, and Kamarudin in 2024, this trend reflects the growing academic interest in understanding how users receive and engage with e-learning platforms, especially in response to the global increase in online education.

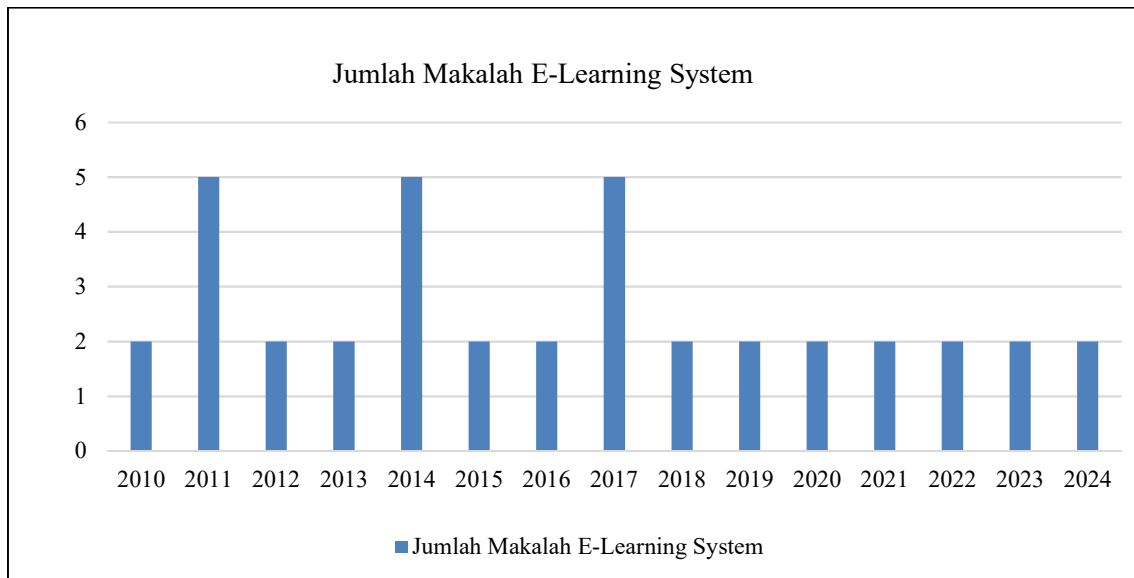


Figure 1. Number of papers of the E-Learning System.

Most of the studies reviewed were conducted in higher education settings, with strong representation from countries in Asia, such as Malaysia, Indonesia, and China. However, there is also a fair distribution of research originating from Europe, North America, and the Middle East, which shows the global relevance of the topic.

Most of the research uses the native TAM framework, which focuses on the core constructs of Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) (Harahap, Samsudin, Muda, & Sugianto, 2024). However, most of the literature extends the model by integrating additional variables, such as social influence, facilitating condition, self-efficacy, and system quality. This extension aims to provide a more nuanced understanding of user behavior by incorporating contextual factors relevant to a particular educational setting.

Quantitative methods dominate methodological approaches, with Structural Equation Modeling (SEM) and Partial Smallest Squares (PLS-SEM) being the most commonly used techniques. A small number of studies use mixed methods or qualitative approaches, which offer deeper insights into user experiences and attitudes.

Several recurring factors were identified as the main influences of LMS acceptance. Perceived Usability and Perceived Ease of Use remain the strongest predictors of behavioral intent to use LMS platforms (Ali & Al-Ahmad, 2025). Other influential factors include instructor support, previous technology experience, and the quality of system content and interface design.

Despite the wealth of the literature, some research gaps were identified. There is a lack of longitudinal studies that track changes in user acceptance over time, as well as limited research in the context of primary and secondary education. Additionally, some studies discuss the adoption of car-based LMS or the role of emerging technologies such as artificial intelligence (AI) in shaping user acceptance.

Overall, the results of this review highlight the enduring relevance of TAM to evaluate LMS adoption and

point to new opportunities for future research, especially in meeting evolving user needs and integrating new technological advancements.

Table 1

Previous Research

No.	Year	Researcher name	Heading	Variable	Result
1	2025	Omar Ali, Ahmad Al-Ahmad	Exploring the Technology Adoption Environment: Challenges and Effective Strategies	Dependent variable: Successful adoption of information technology Independent variables: 1. Top Management Challenges 2. End User Challenges 3. Resource Configurations 4. Technological Issues	1. Increase human resource capacity and training 2. Encourage top management involvement 3. Strengthen organizational culture that supports innovation 4. Provide a roadmap for risk-based technology implementation
2	2025	Diana Teresa Parra-Sánchez	Exploring the Adoption of the Internet of Things in the Fourth Industrial Revolution: A Comprehensive Scientometric Analysis	Dependent variabel: Adoption Internet of Things Independent variabels: 1. Perceived usefulness, 2. Perceived ease of use 3. Technology readiness 4. Organisational support 5. Environmental pressure	1. Publication trend increases 2. 6 main clusters of IoT adoption research 3. Most influential topic (citation burst)
3	2025	Dalal Alshehri, Nasimul Noman, Raymond Chiong, Shah J. Miah, Aaron L. Sverdllov, Doan TM Ngo	Factors Influencing the Adoption of the Internet of Medical Things for Remote Patient Monitoring: A Systematic Literature Review	Depending on the variables Behavioral Intentions to use Independent behavior variables 1. Performance expectations 2. Business expectations 3. Social influences 4. Facilitation conditions 5. Hedonic motivation 6. Price values 7. Habits	1. The TAM (Technology Acceptance Model) is considered too narrow and does not consider social, emotional, or security aspects. 2. Models such as PMT, DOI, PCM, and TTF are also considered less comprehensive. 3. The most influential factor on IoMT adoption is performance expectancy.
4	2025	Mark Turner, Barbara Kitchenham, Pearl Brereton, Stuart Charters, David Budgen	Does the Technology Acceptance Model Predict Actual Use? Systematic Literature Review	Dependent variables: 1. Behavioral Intention to use (BI) 2. Actual Usage Independent variables: 1. Perceived Usefulness (PU) 2. Perceived Ease of Use (PEU)	1. BI (Behavioral Intention) tends to correlate with actual use. 2. However, two TAM core variables—Perceived Usefulness (PU) and Perceived Ease of Use (PEU)—show a weaker correlation with actual usage. 3. Subjective measurements (e.g. self-reports) show a stronger relationship between TAM and actual usage.
5	2024	Shengwei Du, Norliana Hashim, Syafila Kamarudin	Launching the Technology Acceptance Model: A Systematic Review of Evolution, Cross-Industry Impacts, and Future Directions	Dependent variables: 1. Actual Use 2. Behavioral Intention to use 3. Attitude towards use Independent variables: 1. Perceived Benefits 2. Perceived Ease of Use External variables	1. The number of research on TAM increased from year to year until about 2021. 2. Key Factors: Perceived Usability, Perceived Ease of Use 3. Perceived Usability, Perceived Ease of Use, attitude, and Behavioral Intent are proven to be the main

					factors influencing actual use. Attitudes toward use, Behavioral Intentions to use, and Actual Use.
6	2024	Rini Oktaria, Sunny Angelia Naibaho, Iskandar Muda, Sambas Ade Kesuma	Factors of E-Commerce Technology Acceptance Among the Public: Integration of Technology Acceptance Models	Dependent variable: Acceptance of e-commerce technology Independent variables: 1. Perceived Usefulness (PU) 2. Perceived Ease of Use (PEOU) 3. Socio-demographic factors	1. Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) are the main factors of TAM that have the most influence on the intention to use e-commerce. 2. Socio-demographic factors: Age: The younger generation is faster to accept e-commerce. 3. Trust and security concerns: Trust plays a huge role in shaping acceptance.
7	2023	Sean Kruger, Adriana A. Steyn	Navigating the Fourth Industrial Revolution: A Systematic Review of Technology Adoption Model Trends	Dependent variable: 1. Industrial revolution 2. Information system Independent Variabel: 1. Smart Technology 2. Technology Adoption	4IR presents new technologies that enable automation and digitization of processes in several areas. The study notes that this multi-disciplinary and multifunctional paradigm is changing the social and economic landscape. To address this requires an understanding of how technology is adopted.
8	2022	Aminu Adamu Ahmed, Alhaji Adamu Saidu	Understanding the Determinants of Cloud Computing Adoption: An Overview of Technology Adoption Models	Dependent variable: Cloud computing adoption Independent variables: 1. Security & privacy 2. Relative advantage 3. Technology readiness	1. TOE model is the most dominant and effective. 2. The most dominant factors influencing CCA.
9	2021	Jinal Shah, Monica Khanna, Dr. Hiren Patel	Technology Adoption and Continuation of MOOCs: A Review of the Systematic Literature, Synthesis, and Future Research Agenda	Dependent Variabel: 1. Behavioral Intention 2. Continued Intention 3. Usage IndependenVariabels : 1. Perceived Usefulness (PU) 2. Perceived Ease of Use (PEOU) 3. Attitude toward using	1. MOOC research trends increase since 2015 2. Most widely used theory: TAM (Technology Acceptance Model) 3. Gaps and future research directions: Lack of research in Western and Latin American countries; lack of qualitative and longitudinal approaches
10	2020	Erhan Pişirir, Erkan Uçar, Oumout Chouseinoglou, Cüneyt Sevgi	Modeling Structural Equations in the Study of Cloud Computing: A Systematic Literature Review	Dependent Variabels: 1. Technology adoption 2. Intention to use 3. Actual Use Independent variables: 1. Security and privacy 2. Cost	1. The trend of SEM use in cloud computing studies is increasing 2. Study focus dominated by cloud adoption 3. Most commonly used theory Technology Acceptance Model (TAM) is the most common theory: Used in 26 studies
11	2019	Roza Ibrahim, Geetha Kanaparan	A Systematic Review of the Literature on Technology Adoption in Higher Education	Dependent variabel: 1. higher education Independent Variabel : 2. technology adoption	From the synthesis, it is proven that technology can change the pedagogy of teaching and learning in universities. They can provide access to 2 sources. Mobile networks and social media are promising technologies for higher education.

12	2018	Jayden Khakurel, Helinä Melkas, Jari Porras	Harnessing the Revolution of Wearables in the Work Environment: A Systematic Review	Dependent variables: 1. Well-being 2. Industrial design and training 3. Collaboration and rapid response 4. Efficiency and productivity Independent Variabel Wearable Technology	Wearable technology has great potential to improve health, safety, and work efficiency—but it needs to be balanced with attention to privacy, regulation, and user acceptance.
13	2017	Zuhal Hussein	Leading to Intent: The Role of Attitude in Relation to Technology Acceptance Models in E-Learning	Dependent variable: Intention to use e-learning Independent variables: 1. Attitude 2. Perceived Usefulness (PU) 3. Perceived Ease of Use (PEU)	1. Students' attitude towards e-learning has a significant and positive effect on the intention to use e-learning (Intention to Use). 2. Perceived Usefulness (PU) (perception of usability) does not have a significant effect on the intention to use e-learning in the context of this study.
14	2016	Ali Tarhini, Kate Hone, Xiaohui Liu, Takwa Tarhini	Examining the Effect of Moderation of Individual-Level Cultural Values on User Acceptance of E-Learning in Developing Countries: Structural Equation Modeling of an Extended Technology Adoption Model	Dependent variables: 1. Behavioral Intention (BI) 2. Actual Usage (AU) Independent variables: 1. Perceived Usefulness (PU) 2. Perceived Ease of Use (PEOU) 3. Social Norms (SN) 4. Quality of Work Life (QWL)	1. PU has a greater impact than PEOU on BI. 2. QWL has the strongest influence on BI.
15	2015	Ali Tarhini, Kate Hone, Xiaohui Liu	Cross-Cultural Examination of the Impact of Social, Organisational and Individual Factors on the Acceptance of Educational Technology Among British and Lebanese Students	Dependent variables: 1. Behavioral Intent (BI) 2. Actual Use (AU) Independent variables: 1. Perceived Usability (PU) 2. Perceived Ease of Use (PEOU) 3. Social Norms (SN) 4. Quality of Working Life (QWL) 5. Computer Self-Efficacy (SE) 6. Facilitation Conditions (FC)	1. PU has a significant influence on Behavioral Intent (BI) in using e-learning. 2. QWL was found to be the most influential factor in explaining behavioral intent (BI) in both samples.
16	2014	Saleh Alharbi, Steve Drew	Using the Technology Acceptance Model in Understanding Academic Behavioral Intentions to Use Learning Management Systems	Dependent variables: 1. Attitude towards use 2. Behavioural Intention to use Independent variables: 1. Perceived Ease of Use 2. Perceived Usability 3. Relevance of the job 4. Lack of availability of the LMS 5. Experience of using the LMS	The results showed that PEOU and PU had a significant effect on attitude towards usage, which ultimately influenced the behavioral intention to use LMS.
17	2013	Mohamed Gamal Aboelmaged, Tarek R. Gebba	Mobile Banking Adoption: An Examination of Technology Acceptance Models and Planned Behavior Theories	Dependent variables: 1. Attitude towards use 2. Behavioral Intent to use 3. Adoption of mobile banking Independent variables: 1. Perceived Usability 2. Perceived Ease of Use	1. Attitudes towards mobile banking and subjective norms have a significant effect on the adoption of mobile banking. 2. Perceived Behavioral Control (PBC) and Perceived Usefulness (PU) do not have a

				3. Subjective Norms 4. Perceived Behavioral Control	significant effect on the adoption of mobile banking.
18	2012	Priyanka Surendran	Technology Acceptance Model: Literature Survey	Dependent variables: 1. Attitude towards use 2. Behavioral Intention to use 3. Actual system use Independent variables: 1. Perceived Ease of Use 2. Perceived Usability External variables	1. Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) are the main factors in determining the acceptance of technology by users. 2. TAM has evolved with various modifications, including TAM2, UTAUT, and TAM-TPB combination models. 3. Various external factors such as social, cultural, political, and psychological can affect the acceptance of technology.
19	2011	Shih-Chih Chen, Shing-Han Li, Chien-Yi Li	Recent Related Research in Technology Acceptance Models: A Review of the Literature	Dependent variables: 1. Attitude towards using 2. Behavioral Intention to use Independent variables: 1. Perceived Ease of Use 2. Perceived Benefits	1. TAM has been widely applied in various fields of technology, including electronic services, mobile data services, self-service technology, and e-learning. 2. Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) are the main factors that affect users' attitudes and intentions in accepting technology. 3. TAM has been further developed with various extensions.
20	2010	Richard J. Holden, Ben-Tzion Karsh	Technology Acceptance Model: Its Past and Future in Healthcare	Dependent variable: Actual Use Independent Variables: 1. Perceived Usefulness 2. Perceived Ease Of Use 3. Attitude 4. Subjective Norm 5. Perceived Behavioral Control	1. TAM is effective in predicting health technology acceptance. 2. Some variables are less consistent in influencing acceptance. 3. Need to modify TAM for health contexts. 4. TAM does not always predict actual usage. 5. Recommendations for future research.

Discussion

Research topics in the implementation of E-Learning Systems: The development of information technology has driven significant transformation in the world of education, one of which is through the application of learning systems. E-learning is a learning method based on digital technology that allows the teaching and learning process to be carried out flexibly, without time and place limitations (Hussein, 2017). The implementation of e-learning offers various advantages such as ease of access to materials, independent learning, and interactivity through digital media. In contrast to conventional learning methods that rely on face-to-face in the classroom, e-learning uses online platforms to deliver learning materials, exams, discussions, and evaluations (Alharbi & Drew, 2014). However, challenges are still found in the implementation of e-learning, such as infrastructure readiness, limited internet access, and the adaptation of educators and students to technology. Overall, the E-Learning System provides an alternative approach that is more flexible and innovative than traditional learning, but requires the

right strategies to maintain learning effectiveness and be able to respond to the current educational needs (Chen, S.-H. Li, & C.-Y. Li, 2011).

Although it offers many advantages, the implementation of e-learning also faces various obstacles, including:

- Inequality of access to technology, especially in remote areas.
- Low digital literacy among teachers and students.
- Lack of social and emotional interaction between teachers and students.
- Challenges in evaluating learning objectively and fairly.
- Dependence on a stable internet network.

In addition, in some contexts, especially at the primary and secondary education levels, students' motivation to learn tends to decline when learning is done in person, due to a lack of discipline and direct involvement (Hussein, 2017).

On the other hand, e-learning has various advantages, such as:

- Flexibility of time and place, allowing students to learn anytime and anywhere.
- Access to digital learning resources, such as videos, articles, interactive quizzes, and discussion forums.
- Personalization of learning, allowing students to learn at their own pace and style.
- Cost efficiency, as it reduces the need for physical and logistical infrastructure.

This advantage is particularly advantageous in the context of higher education and professional training, where learners are required to be more independent.

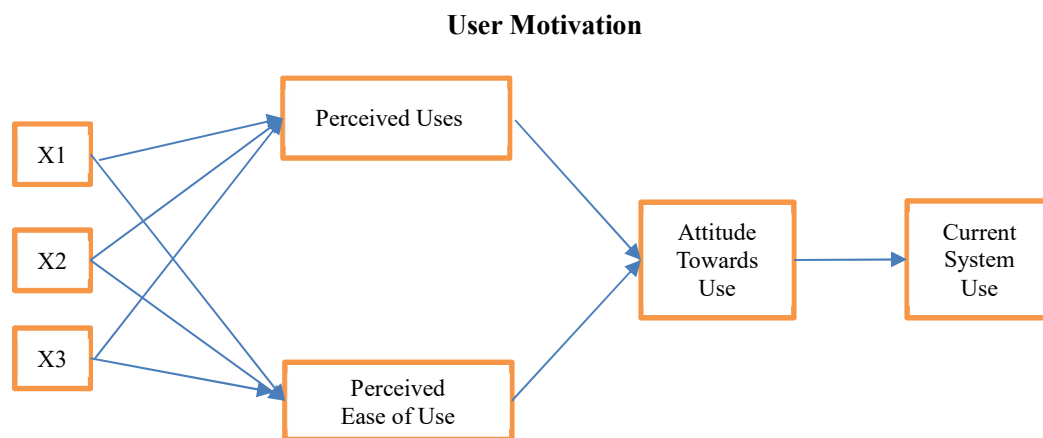


Figure 2. 1989 Technology Acceptance Model.

Conclusion

This study aims to answer evidence from the results of previous research that has been identified, assessed, and interpreted. Based on the search and selection process, 20 Scopus papers discuss the implementation of the E-Learning System, with a publication year from 2010 to 2025 (Hussein, 2017). The implementation of the E-Learning System focuses on six topics of intent, adoption, implementation barriers, individual performance, and loyalty. The most widely used method is survey research with a cross-sectional design. In addition, TAM is often used to discuss the implementation of E-Learning Systems.

Only a few SLRs about the implementation of the E-Learning System explain comprehensively. Therefore, this SLR seeks to conduct a comprehensive discussion, with a review of the latest papers. SLR outlines the

implications that can help practitioners in overcoming slowdown problems in the implementation of E-Learning Systems. These results can be used as empirical evidence for future researchers in the field of E-Learning System applications.

The search process is done manually. As a result, other papers on the implementation of E-Learning Systems may be excluded. Further research is expected to increase the number of papers, with papers having longer publications, and journals of wider publications. In addition, further research can review papers with design, methods, and dissective theories. In particular, the E-Learning System has been implemented for quite a long time. Therefore, further research is expected to evaluate the success of the implementation of the learning system.

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