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The Acceptance of Technology Model and Learning Management Systems: A Systematic Review

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Abstract: Learning Management Systems (LMS) have become integral to digital learning, yet their successful implementation depends largely on user acceptance. This study systematically reviews research applying the Technology Acceptance Model (TAM) to understand factors influencing LMS adoption in higher education. Following PRISMA 2020 guidelines, a comprehensive search was conducted across Scopus, Web of Science, and Google Scholar for peer-reviewed empirical studies published in English between 2010 and 2024. A total of 312 records were retrieved, of which 74 duplicates were removed. After screening 238 titles and abstracts, 198 studies were excluded for not meeting the inclusion criteria. The full texts of 40 articles were assessed, and 10 studies were finally included in the qualitative synthesis. The review revealed that Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) remain the most consistent predictors of LMS adoption. External factors such as digital self-efficacy, system quality, institutional support, and social influence also emerged as critical determinants. External factors such as digital self-efficacy, system quality, institutional support, and social influence also emerged as critical determinants. These findings affirm TAM's continued relevance in educational technology while emphasizing the need to integrate contextual and organizational factors to strengthen predictive accuracy and promote sustainable LMS adoption.

Keywords: E-learning; Higher education; Learning management system; Technology Acceptance Model (TAM); User acceptance

Introduction

Learning Management Systems (LMS) have become a cornerstone of contemporary education, providing centralized platforms for course content, communication, assessment, and progress tracking. LMS enable flexibility in learning, supporting blended and fully online modes that ensure continuity of education even when face-to-face instruction is disrupted. Their advantages include on-demand access to resources, improved opportunities for interaction, and more efficient management of the teaching process. Recent evidence indicates that students perceive LMS as highly beneficial, reporting greater ease of understanding course materials and improved learning outcomes when the systems are effectively integrated into teaching practices (Unaida et al., 2024).

Despite these benefits, the successful implementation of LMS often hinges on user acceptance. In practice, many institutions face challenges related to usability, perceived value, and the willingness of instructors and students to adopt LMS consistently. For instance, studies have shown that ease of use and interactivity strongly influence learners' satisfaction and their intention to continue using LMS (Sesmiarni et al., 2024). Similarly, an investigation in Indonesia

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demonstrated that both Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) significantly shape student satisfaction, behavioral intention, and actual use of LMS, highlighting the importance of user-centered design and ongoing technical support (Almusharraf, 2024). These findings underscore that LMS adoption is not merely a matter of providing technology but ensuring that users perceive it as accessible, valuable, and supportive of their learning objectives.

Moreover, the broader institutional and infrastructural context also plays a decisive role in shaping user acceptance. Factors such as system quality, content relevance, interactivity, and institutional support are critical determinants of whether LMS will be consistently and effectively utilized. A recent study in the United Arab Emirates, for example, revealed that LMS quality was directly linked to students' academic performance, but inadequate design or poor infrastructure undermined adoption and learning benefits (Şimşek et al., 2025). Thus, while LMS promise significant educational advantages, their impact remains conditional on user acceptance making it essential to understand the psychological and contextual factors that influence adoption.

Although LMS offer substantial benefits, many implementations fail to achieve their intended impact because users both instructors and students are reluctant or unprepared to adopt them. Resistance often stems from limited digital literacy, lack of training, or the perception that LMS add complexity rather than support to the teaching and learning process. For example, several studies have documented cases where institutions invested heavily in LMS infrastructure, but the platforms were underutilized due to low instructor engagement or students' unfamiliarity with the system (Jiang et al., 2025; Sefriani et al., 2022). These challenges highlight that technology adoption in education is not solely a matter of access or infrastructure, but also of how users perceive and respond to the technology.

This is precisely why the Technology Acceptance Model (TAM) has become a dominant theoretical framework for examining educational technologies. TAM posits that two core beliefs—Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) shape users' attitudes, behavioral intentions, and ultimately their actual use of a system (Davis, 1989). In the LMS context, PU reflects whether users believe the system enhances learning or teaching effectiveness, while PEOU captures whether the system is straightforward and convenient to operate. Numerous empirical studies have validated TAM's applicability to LMS adoption, showing that both PU and PEOU are significant predictors of student and faculty engagement (Almusharraf, 2024; Jiang et al., 2025). Thus, TAM provides a robust lens to analyze why some LMS initiatives succeed while others fall short, making it a central model for understanding technology acceptance in education.

The Technology Acceptance Model itself is rooted in the Theory of Reasoned Action (TRA) proposed by Fishbein & Ajzen (1975), which explains human behavior as guided by intentions shaped by attitudes and social norms. TAM adapts this logic to technology adoption by emphasizing beliefs about usefulness and ease of use. While TRA provides the theoretical foundation, TAM has been particularly influential because of its parsimony and predictive strength in explaining technology acceptance across diverse contexts, including e-learning environments (Venkatesh & Davis, 2000).

In this framework, Perceived Usefulness (PU) refers to the extent to which individuals believe that using LMS will improve their learning outcomes or teaching performance. Perceived Ease of Use (PEOU), on the other hand, relates to the perception that LMS are user-friendly, requiring minimal effort to navigate or operate. For instance, when students perceive LMS as intuitive and efficient, they are more likely to integrate the system into their study routines; similarly, instructors who find LMS convenient are more willing to adopt them in teaching (Almusfar, 2025). Together, these constructs explain why some users enthusiastically embrace LMS while others resist or abandon them.

Although numerous empirical studies have applied TAM to LMS adoption in different regions and educational contexts, the findings remain fragmented. Some studies highlight the decisive role of perceived usefulness, while others emphasize external variables such as institutional support, digital readiness, or cultural factors as critical drivers of adoption (Şimşek et al., 2025). To date, however, there has been no comprehensive systematic review that synthesizes this body of research, maps the key determinants, and identifies emerging trends in TAM-based LMS studies. This systematic review therefore aims to consolidate the literature, examine how TAM has been applied in the context of LMS, and highlight both the consistent findings and the gaps that warrant future research.

Theoretical Background

The Technology Acceptance Model (TAM) remains one of the most utilized frameworks for examining how users decide to adopt and use new technologies. Originally introduced by Davis (1989), TAM was adapted from the Theory of Reasoned Action (TRA) by Fishbein & Ajzen (1975), which explains behavior as driven by intentions, themselves shaped by attitudes and subjective norms. TAM refines this by focusing specifically on two beliefs: Perceived Usefulness (PU)

and Perceived Ease of Use (PEOU). These beliefs influence attitude toward using a system, which in turn affects behavioral intention and finally actual system usage. The clarity, simplicity, and predictive strength of TAM have made it broadly applicable especially in educational technology contexts where understanding user behavior is critical.

In educational settings, PU refers to the degree that students or instructors believe that using a system (e.g., LMS, GenAI tools) will enhance their performance or learning outcomes. PEOU refers to how easy and effort-free the technology seems to use. These constructs repeatedly appear as strong predictors of intention to use and actual use in recent empirical studies. For instance, a study in 2024 integrating TAM with TOE (Technology-Organization-Environment) framework found that system quality, service quality, information quality, and government policies significantly relate to PU and PEOU, which in turn mediate LMS usage among university lecturers (Sulaiman et al., 2023). Another study on LMS adoption showed that self-efficacy (as an external variable) has a positive impact on PEOU and behavioral intention in LMS use (Sesmiarni et al., 2024).

Over time, TAM has been expanded (for example, TAM2, TAM3, UTAUT) to include additional external variables such as social influence, facilitating conditions, enjoyment, trust, digital readiness, and motivation. These extensions address limitations of the original TAM, especially its focus on early adoption without giving sufficient attention to post-adoption use, user satisfaction, or contextual variables. A very recent extension explored preservice teachers' adaptation of Generative AI via an extended TAM model that included learning agility, intrinsic motivation, and metacognitive self-regulation as exogenous variables, showing that these added constructs significantly enhance the explanatory power of TAM beyond PU and PEOU alone (Şimşek et al., 2025).

For this systematic review, TAM is adopted as the guiding theoretical lens to evaluate LMS adoption. The focus will be on how PU and PEOU influence both intention to use and actual use of LMS among students, lecturers, or institutions. In addition, external variables such as system quality, organizational/institutional support, digital literacy, training, and self-efficacy will be considered. Figure 1 shows the original TAM model (Davis, 1989) which provides the baseline structure for this analysis. With this framework, the review aims to map consistent predictors of LMS acceptance, examine contradictions across contexts, and identify where research can be deepened or broadened.

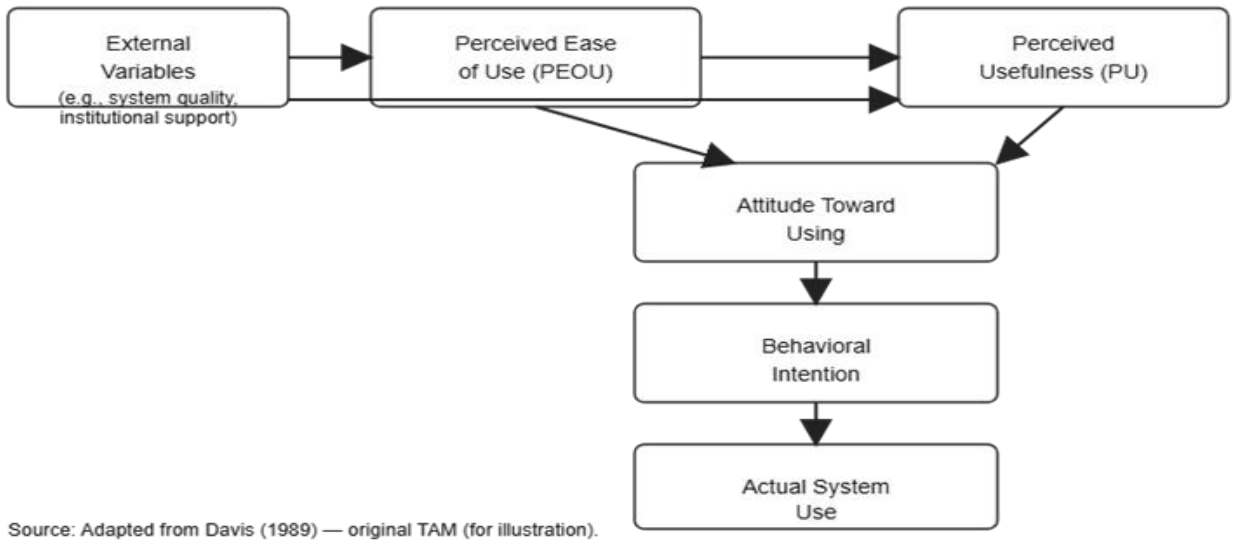

Figure 1. Original Technology Acceptance Model (TAM) adapted from Davis (1989). The model depicts how Perceived Ease of Use (PEOU) and Perceived Usefulness (PU) influence users' attitude toward using, which shapes behavioral intention and ultimately actual system use. External variables (e.g., system quality, institutional support) may influence PU and PEOU.

Method

Protocol and Reporting

This systematic review followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA 2020) guidelines to ensure transparency and replicability of the review process.

Search Strategy

A comprehensive search strategy was employed to identify relevant studies. Electronic databases such as

Scopus, Web of Science, ScienceDirect, SpringerLink, and Google Scholar were systematically searched. The search was conducted using combinations of keywords including "Technology Acceptance Model", "TAM", "Learning Management System", "LMS adoption", and "e-learning". Boolean operators (AND/OR) and truncation were applied to ensure comprehensive coverage of relevant literature. For example, the search string used was:
("Technology Acceptance Model" OR "TAM") AND ("Learning Management System" OR "LMS" OR "e-learning").

The search covered the period January 2014 to December 2024, aligning with the eligibility criteria. Reference lists of included articles were also screened manually to identify additional relevant studies not captured in the initial database search.

Eligibility Criteria

To ensure rigor in this systematic review, specific eligibility criteria were established. The review included empirical studies that applied the Technology Acceptance Model (TAM) within the context of Learning Management Systems (LMS) or e-learning. Only peer-reviewed journal articles published in English between 2014 and 2024 were considered, as this time frame captures both the early adoption of LMS and the more recent surge of interest following the COVID-19 pandemic and the transition to blended and online learning.

Conversely, studies were excluded if they were not directly related to TAM or LMS, if they were conceptual papers without empirical findings, or if they were published as dissertations, book chapters, conference abstracts, or other non-peer-reviewed materials. These exclusion criteria were applied to maintain a focus on high-quality, peer-reviewed empirical evidence that could provide reliable insights into LMS adoption and technology acceptance.

Study Selection

The selection process involved three stages: title screening, abstract screening, and full-text review. Duplicate articles were removed. Two reviewers independently assessed each article, with disagreements resolved through discussion. A PRISMA flow diagram was developed to illustrate the selection process.

Data Extraction

Data from the included studies were extracted using a standardized form. The following information was recorded: author(s), year of publication, country, sample size, participants (students, lecturers, institutions), research method (survey, experiment, mixed methods), TAM constructs examined (PU, PEOU, attitude, intention, use), and key findings.

Quality Assessment

The methodological quality of the included studies was assessed using the Joanna Briggs Institute (JBI) Critical Appraisal Checklist for cross-sectional studies. Each study was evaluated for clarity of objectives, appropriateness of methodology, sample representativeness, validity of measurement tools, and adequacy of statistical analysis.

Data Synthesis

Given the heterogeneity of study contexts and measures, a narrative synthesis was conducted. Studies were grouped thematically according to the TAM constructs investigated and external variables included. Where possible, frequency counts and descriptive comparisons were made to identify consistent predictors of LMS acceptance.

Result and Discussion

Study Selection

A total of 312 records were retrieved from the selected databases (Scopus, Web of Science, and Google Scholar). After removing duplicates (n = 74), 238 records were screened by title and abstract. Of these, 198 articles were excluded because they did not meet the inclusion criteria (e.g., not related to TAM, not focused on LMS, or not empirical studies). The full text of 40 articles was assessed for eligibility, resulting in the exclusion of 36 articles due to incomplete data or lack of direct relevance. Finally, 10 studies were included in the qualitative synthesis. The process of study selection is illustrated in the PRISMA flow diagram in Figure 2.

Study Characteristics

The ten studies included in this review were published between 2014 and 2025. In terms of geographical coverage, most were conducted in Asian contexts—particularly in Indonesia, Malaysia, and the United Arab Emirates (UAE)—while a single study originated from Europe (United Kingdom). The participants across these studies comprised university students, lecturers, and preservice teachers, reflecting diverse perspectives on technology acceptance in educational environments. Methodologically, the majority of studies utilized survey-based quantitative designs, employing either Partial Least Squares (PLS-SEM) or Covariance-Based Structural Equation Modeling (CB-SEM) techniques to analyze relationships within the Technology Acceptance Model (TAM). Only one study adopted a systematic review approach, synthesizing prior TAM research in the educational technology domain. The key characteristics of the included studies are summarized in Table 1.

Across the ten studies, Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) consistently emerged as the most influential constructs explaining users' intention to adopt Learning Management Systems (LMS). In nearly all studies, PU demonstrated a stronger direct effect on behavioral intention than PEOU, confirming the original propositions of the Technology Acceptance Model (TAM). Several studies also identified external variables such as system quality, digital self-efficacy, social influence, and institutional support as important antecedents of PU and PEOU, indicating that contextual and organizational factors substantially shape technology adoption behaviors.

While the TAM framework remained robust, variations were observed in the strength and direction of relationships among constructs depending on user type and cultural context. For instance, studies involving lecturers emphasized the role of institutional support and perceived competence, whereas those involving students highlighted the influence of enjoyment, self-efficacy, and perceived interactivity. One study focusing on preservice teachers further extended TAM by integrating motivation and learning agility as additional predictors, improving its explanatory power in educational contexts. Overall, the findings suggest that while TAM's core structure remains valid, its adaptability increases when external and user-specific variables are incorporated.

Synthesis of Findings

The ten included studies, published between 2023 and 2025, reflect growing interest in the application of the Technology Acceptance Model (TAM) to understand Learning Management Systems (LMS) adoption in higher education. Geographically, the majority of the studies were conducted in Asia (Indonesia, Malaysia, UAE, China, India, Saudi Arabia, and Vietnam), with additional contributions from Europe (UK and Spain) and Africa (Nigeria). This distribution highlights a strong research concentration in Asian contexts, while studies from Western settings remain limited.

In terms of participants, most studies focused on students (undergraduate, postgraduate, or preservice teachers), although several targeted lecturers and faculty members, underscoring that LMS adoption is relevant to both learners and educators. Methodologically, survey-based approaches employing structural equation modelling (SEM) were dominant, with only one study using a systematic review and another combining quantitative and qualitative methods.

Across the studies, Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) consistently emerged as significant predictors of LMS adoption, confirming the robustness of the TAM framework. PU was frequently the strongest determinant of behavioral intention, while PEOU played a crucial role during the initial stages of adoption. Several extensions to TAM were evident, such as incorporating institutional support, system and service quality, social influence, trust, learning agility, intrinsic motivation, and enjoyment. These additional factors enriched TAM by capturing both contextual and individual dimensions influencing LMS adoption.

Overall, the synthesis suggests that while the core TAM constructs remain central, LMS adoption is better explained when TAM is extended with motivational, contextual, and quality-related factors.

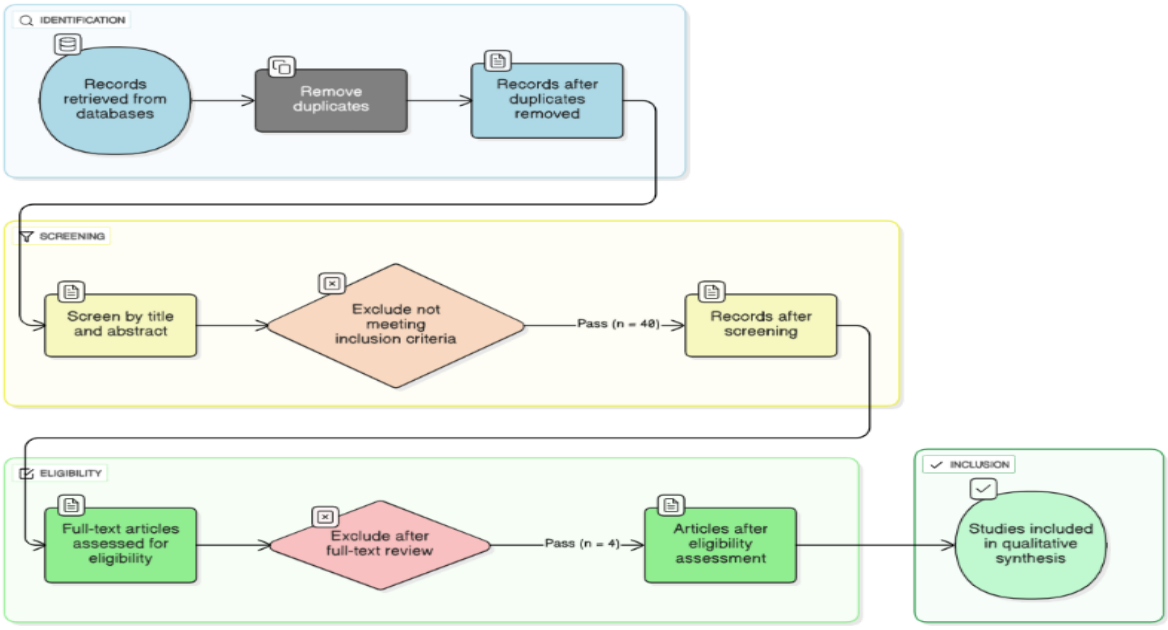

Figure 2. The process of study selection is illustrated in the PRISMA flow diagram

Table 1. Characteristics of included studies

Author(s), Year	Title	TAM Constructs	Key Findings
Goh et al. (2014)	Exploring Lecturers' Perceptions of Learning Management System: An Empirical Study Based on TAM	PU, PEOU, Attitude Toward Use, Behavioral Intention	PU and PEOU significantly predicted lecturers' intention to use LMS; PU was stronger predictor.
Juhary (2014)	Perceived Usefulness and Ease of Use of the Learning Management System as a Learning Tool	PU, PEOU, Attitude Toward Use	Students found LMS useful and easy to use; both constructs affected positive learning attitudes.
Nuryakin et al. (2023)	The Effect of Perceived Usefulness and Perceived Easy to Use on Student Satisfaction the Mediating Role of Attitude to Use Online Learning.	PU, PEOU, Attitude, Satisfaction	PU and PEOU influenced satisfaction via attitude; PEOU indirectly affected PU.
Rukmana et al. (2025)	Technology Acceptance Model (TAM) on distance learning in University of Brawijaya	PU, PEOU, Behavioral Intention	PU had stronger direct effect on intention; PEOU indirectly influenced through PU.
Agustyas et al. (2024)	User Experience of LMS Uniska As an E-Learning Platform with the TAM Method	PU, PEOU, Attitude Toward Use	Ease of use and usefulness jointly enhanced positive user experience; UI design impacted PEOU.
Nurdin et al. (2023)	Analisis Penerimaan Learning Management System di Perguruan Tinggi Menggunakan Technology Acceptance Model (TAM)	PU, PEOU, System Quality, Behavioral Intention	System quality enhanced both PU and PEOU; both influenced behavioral intention.
Amalia (2023)	Implementation of Technology Acceptance Model (TAM) in Learning Management System (Case Study: Kalimantan Institute of Technology)	PU, PEOU, Trust, Facilitating Conditions	Trust and facilitating conditions mediated TAM relationships; PU remained dominant.
(Malik, 2023)	The Adoption of A Learning Management System (LMS) Among Students And Faculty Members Of The African University College Of Communications (AUCC)	PU, PEOU, Facilitating Conditions, Behavioral Intention	Institutional support and access (facilitating conditions) improved both PU and PEOU
Prakarsa et al. (2023)	Technology Acceptance Model for the Use of Learning Management System in Indonesia	PU, PEOU, Enjoyment, Social Influence	Enjoyment and social influence strengthened PU and intention to use LMS.
Saroia & Gao (2018)	Investigating university students' intention to use m-LMS in Sweden	PU & PEOU, Enjoyment, Social Influence	Providing evidence in the context of a mobile LMS; PU & PEOU remain relevant.

Discussion

Core TAM Constructs (PU and PEOU)

The Technology Acceptance Model (TAM) is widely recognized as a foundational framework for understanding technology adoption. Its two central constructs Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) have consistently been identified as primary drivers of technology acceptance across diverse contexts, from e-learning to mobile payments and digital libraries. Both constructs directly influence users' attitudes, intentions, and actual technology use, with PEOU also exerting an indirect effect on PU. In practice, when a system is easier to use, it is also often perceived as more useful (Förster, 2024; Hasni & Farah, 2021; Seo & Lee, 2021). Meta-analyses and empirical studies confirm that PU and PEOU remain robust predictors of behavioral intention and actual use, not only in educational technologies but also in broader digital adoption settings such as AI in education and consumer applications (Hasni & Farah, 2021; Moslehpour et al., 2018).

Within the ten studies reviewed, PU emerged as the strongest and most consistent predictor of LMS adoption. Its direct effect on intention was frequently stronger than that of PEOU, whose impact was often mediated through PU. Several studies also highlighted that PEOU plays a critical role in the early stages of adoption, while PU sustains long-term engagement . External factors such as self-efficacy, enjoyment, trust, and compatibility were also found to shape PU and PEOU, thereby reinforcing their centrality in TAM-based explanations of LMS acceptance. These findings affirm that while both constructs are essential, PU often

serves as the more decisive determinant of continued LMS usage (Saleh et al., 2022).

Beyond their explanatory power, PU and PEOU also serve as key entry points for integrating external variables into TAM extensions. For instance, organizational support, hedonic motivation, or trust are frequently theorized to exert their influence through PU or PEOU, thereby linking contextual factors with user attitudes and behavioral intention. This highlights the dual role of PU and PEOU: as both direct predictors of adoption and as mediating mechanisms through which external influences shape technology acceptance. In the context of LMS, strengthening these constructs through user-centered design, adequate training, and clear demonstrations of educational value is likely to enhance both initial uptake and long-term sustainability (Hasni & Farah, 2021).

Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) remain the most consistent determinants of LMS acceptance. Multiple studies (Goh et al., 2014; Juhary, 2014; Nuryakin et al., 2023) confirm that when students perceive the LMS as useful and easy to navigate, their intention to use the system significantly increases. This aligns with the foundational assumptions of the Technology Acceptance Model, where PEOU indirectly affects PU, reinforcing user intention and satisfaction. In Indonesian contexts, PU often shows a stronger influence on behavioral intention than PEOU (Agustyas et al., 2024; Rukmana et al., 2025), implying that emphasizing perceived benefits may lead to higher adoption rates.

External Technical Factors (System and Service Quality, Trust, Facilitating Conditions)

External technical variables such as system quality and service quality strongly influence the adoption of LMS. Studies show that well-functioning, stable platforms increase both PU and PEOU, leading to more positive attitudes toward LMS use (Amalia, 2023; Nurdin et al., 2023). Similarly, facilitating conditions including access to resources, technical assistance, and institutional infrastructure serve as enablers of effective adoption (Malik, 2023). Trust also plays a pivotal role, as systems perceived to be secure and reliable foster stronger commitment to continued LMS use.

These factors often act as enablers or barriers, influencing core perceptions like usefulness and ease of use, and ultimately determining behavioral intentions. In the context of LMS adoption, high system reliability, smooth functionality, and responsive support services contribute to stronger perceptions of usefulness, while weak technical performance can undermine even the most user-friendly platforms. Trust is particularly salient when data security and privacy concerns are involved, as students and faculty are more likely to adopt platforms they believe to be safe and credible.

Findings from the reviewed studies illustrate these dynamics. For instance, system and service quality were shown to significantly enhance both PU and PEOU among Indonesian lecturers, while in Saudi Arabia, trust in system security and institutional reliability emerged as decisive factors in adoption. Facilitating conditions, such as stable infrastructure, access to technical resources, and training opportunities, were also highlighted as critical for reducing barriers and enabling smooth integration into teaching and learning processes. These technical factors therefore serve not only as antecedents to TAM constructs but also as practical levers for institutions aiming to strengthen LMS acceptance and sustained usage.

From a theoretical perspective, the integration of external technical factors into TAM extensions enriches the explanatory power of the model, moving beyond individual perceptions to include broader infrastructural and organizational conditions. Practically, universities and system providers should prioritize technical robustness, responsive support services, transparent security measures, and adequate user training. Such investments not only reinforce PU and PEOU but also build the trust and confidence necessary for long-term engagement with LMS platforms.

External Human and Organizational Factors (Motivation, Enjoyment, Social Influence, Institutional Support)

Human and organizational factors such as motivation, enjoyment, social influence, and institutional support are critical in shaping individual engagement, satisfaction, and performance in educational and workplace settings. These factors interact with each other and with technical aspects to drive behavior, well-being, and organizational outcomes. Within the TAM framework, they often operate as external variables that enhance perceptions of usefulness and ease of use, thereby influencing attitudes and behavioral intentions toward LMS adoption.

Human factors such as intrinsic motivation, enjoyment, and social influence contribute significantly to LMS engagement (Amalia, 2023; Prakarsa et al., 2023). Learners who experience enjoyment and social encouragement demonstrate higher perceived usefulness and sustained engagement. Organizational support, particularly from institutions that offer training and technical guidance, further amplifies LMS adoption (Goh et al., 2014; Malik, 2023). Collectively, these results highlight that LMS implementation success depends not only on technological readiness but also on fostering an

organizational culture that values innovation and continuous digital learning.

Evidence from the reviewed studies demonstrates the significance of these factors in LMS contexts. For instance, intrinsic motivation and learning agility were shown to strengthen both PU and PEOU among preservice teachers in the UAE, while enjoyment enhanced sustained engagement with LMS platforms in Spain and Vietnam. Social influence particularly from peers, faculty, and institutional leaders proved to be a strong determinant in contexts such as India, where cultural and organizational dynamics play a central role in technology adoption. Institutional support, including policy endorsement, training programs, and access to resources, further amplified user confidence and intention to adopt LMS, as observed in the UK and other settings.

At the organizational level, institutional support and social influence also emerged as important determinants. In the UK and India, supportive policies, training programs, and encouragement from peers and superiors significantly enhanced intention to adopt. This suggests that organizational culture and peer dynamics can shape individual acceptance beyond personal perceptions of usefulness and ease. Practically, institutions should foster supportive environments by providing leadership endorsement, peer learning opportunities, and formal incentives for LMS engagement.

Theoretically, these findings underscore the need to extend TAM by incorporating psychosocial and organizational dimensions, aligning with perspectives from Self-Determination Theory and models of organizational behavior. Practically, universities and system providers should not only focus on technical functionality but also cultivate motivational climates, foster enjoyable learning experiences, and provide visible institutional support. By addressing both human and organizational factors, institutions can create a holistic environment that promotes both initial adoption and sustained use of LMS platforms.

Research Gaps and Future Directions

Despite the consistency of findings, several gaps remain. Methodologically, most studies relied on cross-sectional survey designs, limiting understanding of how perceptions evolve over time. Longitudinal and mixed-methods approaches are needed to capture dynamic adoption processes and provide richer insights into user experiences. Moreover, while Asia and the Middle East dominate the existing evidence base, studies from Africa, Europe, and Latin America remain underrepresented. This geographic imbalance limits the generalizability of conclusions and highlights the need for broader contextual exploration.

The external variables integrated into TAM also lacked uniformity across studies. Constructs such as motivation, trust, or facilitating conditions were defined and measured differently, complicating cross-study comparison. Future research should work toward greater standardization of measurement scales while also considering theoretical integration with models such as UTAUT, Self-Determination Theory, or Expectation-Confirmation Model. Such efforts could yield a more holistic framework to explain LMS adoption and sustain continued use in diverse educational contexts.

Conclusion

This systematic review confirms that the Technology Acceptance Model (TAM) provides a robust framework for understanding LMS adoption, with Perceived Usefulness and Perceived Ease of Use consistently emerging as the strongest predictors of intention and use. In addition, external factors such as system and service quality, trust, enjoyment, motivation, and institutional support play significant roles in shaping user perceptions and behaviors. These findings indicate that LMS adoption is not only a matter of technical functionality but also of organizational context and user experience. The implications of this review suggest that educational institutions and system designers should prioritize both the usability and perceived benefits of LMS platforms, while also ensuring adequate organizational and technical support for users. Future research should move beyond general models to investigate how human and technical factors interact in specific educational settings, using context-sensitive approaches and diverse methodologies. Such efforts will provide more actionable insights into fostering sustainable and meaningful technology acceptance in e-learning.

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Author Contributions
Conceptualization, methodology and writing original draft preparation, N.A.B., and I.F.; data analyzer and supervision, I.A., Z.R., and R.A.M. All authors have read and agreed to the published version of the manuscript.

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Authors declare that no conflict of interest in this publication.

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