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PAPER

Technology Acceptance Model in Indonesian Education: A Systematic Literature Review

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ABSTRACT

The technology acceptance model (TAM) has demonstrated its value as a framework for assessing the determinants that shape users' willingness to embrace new technologies. Nevertheless, a noticeable empirical gap remains regarding how TAM is currently implemented in Indonesia's educational landscape. This study employs a systematic literature review (SLR) to consolidate and depict the present trajectory of TAM-related scholarship in Indonesian education. In total, 119 scholarly articles were retrieved from Sinta, the official journal indexing system of the Republic of Indonesia. The findings indicate that TAM was first introduced into Indonesian educational research in 2010. The learning management system (LMS) emerges as the most extensively assessed platform. The predominant study participants are university students, particularly those enrolled in vocational and engineering programs. The majority of TAM-related articles appear in journals accredited at the Sinta 2 level. Central Java accounts for the largest concentration of studies, and self-efficacy is the most commonly examined external construct within the TAM model.

KEYWORDS

technology acceptance model (TAM), education, learning, systematic literature review (SLR), Indonesia

1 INTRODUCTION

Learning is a process through which knowledge is transmitted from educators to students. The fundamental nature of education has remained consistent over time, from the past to the present. Teachers function as intermediaries who connect knowledge with the students who receive it [1]. A variety of instructional approaches are utilized, ranging from verbal explanations to the use of instructional media to enhance comprehension.

In 1657, Johann Amos Comenius authored the first illustrated textbook, Orbis Sensualium Pictus, which marked the early incorporation of visual materials into the learning process [2]. Subsequently, in the 1990s, the emergence of computers

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and internet technologies represented a significant milestone in global technological advancement, including within the educational sector [3]. To date, these developments have enabled students worldwide to access a wide range of learning modalities.

In recent decades, technology has emerged as a prominent area of education research. Numerous innovations have been introduced to support teaching and learning processes [4], [5], [6]. As a result of these developments, students are expected to become digital natives, learners who are proficient in utilizing technological tools and digital systems [7]. The transformation of educational practices was further accelerated by the COVID-19 pandemic. Students accustomed to face-to-face instruction were abruptly confronted with the realities of remote learning [8]. This transition generated both challenges and opportunities. On the one hand, students were unable to interact directly with their educators, which limited opportunities for immediate discussion and spontaneous questioning. On the other hand, the situation contributed to the development of a generation of students with enhanced technological competence. Although the COVID-19 pandemic has subsided, many of the technologies adopted during that period continue to be utilized, albeit not as intensively as before.

Although new systems and technologies continue to emerge, their adoption requires thoughtful, deliberate assessment [9], [10], [11]. The degree to which users embrace a system has a direct influence on learning performance, particularly when the technology is integrated over an extended period. Without comprehensive analysis and systematic evaluation, there is a significant risk of user resistance, which can render implementation ineffective and limit its potential impact. To address this challenge, a theoretical framework was introduced to examine the determinants that shape an individual's willingness to adopt and utilize new technologies. This framework, known as the technology acceptance model (TAM), was developed by Fred Davis in 1989 [12].

The effectiveness of this theory has been validated through rigorous research undertaken across virtually every region of the world. A substantial body of prior scholarship has consistently confirmed its dependability and empirical strength. Table 1 highlights several influential studies on the TAM framework that have attracted significant attention for their comprehensive analyses and meaningful contributions to advancing this field.

Table 1. Relevant study

No.	Study	Study Objective	Summary
1.	Nikola Marangunic and Andrina Granic (2015) [13]	This paper aims to deliver current, thoroughly researched insights drawn from both foundational and recent literature on the TAM, while also outlining promising avenues for future inquiry in this field.	A total of 85 scholarly articles were systematically examined in this study. The results reveal that the TAM has progressed through the integration of additional external determinants that have continually emerged and matured over time. Originally grounded in the core constructs of perceived usefulness and perceived ease of use, TAM has since broadened to incorporate supplementary variables such as user experience, voluntariness, job relevance, output quality, result demonstrability, trust, and elements adapted from complementary theoretical frameworks.
2.	Andrina Granić and Nikola Marangunić (2019) [14]	This study employs a systematic literature review (SLR) to provide a comprehensive overview of global research on the TAM in education.	A total of 71 peer-reviewed studies published between 2003 and 2018 were systematically examined. The analysis demonstrates that the majority of TAM investigations identified students as the primary research population. In addition, the review highlights Taiwan as a leading contributor to technology adoption research, as reflected in the high volume of education-related TAM publications originating from that country.

(Continued)

Table 1. Relevant study *(Continued)*

No.	Study	Study Objective	Summary
3.	Salloum et al. (2019) [15]	This study combines an SLR with an empirical analysis to identify and validate key determinants of e-learning adoption. Data were collected from 435 students at five universities in the United Arab Emirates through a structured survey.	The results highlight several key determinants of e-learning adoption within the TAM framework, including computer self-efficacy, system quality, information quality, perceived enjoyment, accessibility, and computer playfulness. Empirical findings show that system quality, computer self-efficacy, and computer playfulness significantly influence perceived ease of use, while information quality, perceived enjoyment, and accessibility positively affect both perceived ease of use and perceived usefulness.
4.	Marikyan et al. (2023) [16]	This study synthesizes a range of scholarly publications to analyze emerging trends in the adoption of Learning Management Systems (LMS) through the lens of the TAM.	A total of 21 publications published between 2010 and 2020 were systematically examined. The highest concentration of TAM-related research on LMS emerged in 2014 and 2018. Students constituted the primary research population in most LMS implementation studies. Findings consistently indicate that perceived usefulness and perceived ease of use significantly influence users' behavioral intention to adopt LMS platforms. Overall, students reported favorable experiences when engaging with the system.

Although the TAM framework has been widely applied, there is no comprehensive synthesis that maps its development within the Indonesian educational context. Existing studies are scattered, conducted in isolated settings, and lack integration. As a result, there is no clear empirical overview showing research trends, dominant variables, methodological patterns, or unexplored areas of TAM in Indonesian education. This creates an empirical gap, as stakeholders and researchers do not have a consolidated evidence base to evaluate how TAM has actually been implemented. To address this gap, this study employs an SLR to systematically identify, classify, and analyze TAM-based studies in Indonesian education. The novelty of this study lies in its integrative mapping approach, which transforms fragmented findings into a structured body of knowledge. By providing a clear research landscape and identifying underexplored directions, this study offers both empirical clarification and practical guidance for future technology implementation and research development in Indonesia's educational sector.

The research objectives are operationalized into the following research questions:

RQ1: How has TAM research evolved in evaluating technology adoption within Indonesia's educational sector?
RQ2: Which systems or technologies are most frequently examined using the TAM framework in Indonesian education?
RQ3: Who are the most frequently targeted research subjects in TAM-based studies in Indonesian education, and what are their main characteristics?
RQ4: In what types of accredited journals is TAM research in Indonesian education most commonly published?
RQ5: How is TAM research geographically distributed across provinces in Indonesia?
RQ6: What external variables have been integrated into the TAM framework in Indonesian education studies, and which variables most consistently demonstrate a significant influence on technology acceptance?

2 RELATED WORKS

The theoretical foundation originated from the seminal investigation conducted by American psychologists Martin Fishbein and Icek Ajzen, who sought to explicate the underlying determinants of human behavior [17]. Their central inquiry addressed a fundamental question: "*what motivates individuals to take action or choose not to?*" Through systematic empirical investigation, they identified two primary determinants of behavioral intention. First, attitude toward behavior is defined as an individual's evaluative appraisal of performing a specific action based on anticipated outcomes [18]. Second, subjective norms, referring to perceived social pressure arising from significant others that may endorse or discourage the behavior. These two constructs jointly shape behavioral intention, which subsequently functions as the immediate antecedent of decision-making and observable action.

Building upon these empirical insights, they formalized the Theory of Reasoned Action (TRA) in the 1970s [19]. The theory postulates that behavior is preceded by behavioral intention, which is jointly determined by attitude toward the behavior and subjective norms. Intention, therefore, functions as the immediate antecedent of observable action. TRA has been extensively applied to explain volitional behavior across diverse social contexts [20]. Nevertheless, TRA exhibits conceptual limitations when applied to technology adoption. The model articulates general behavioral intention but does not explicitly incorporate cognitive evaluations specific to technological systems [21]. Consequently, it lacks explanatory precision in contexts where perceptions of system utility and usability shape adoption decisions. To address this theoretical gap, Fred Davis introduced the TAM in 1989. TAM recontextualized TRA within the domain of information systems by specifying belief constructs directly associated with technology adoption.

The TAM conceptualizes technology adoption through five principal constructs, i.e., perceived usefulness, perceived ease of use, attitude toward use, behavioral intention to use, and actual system use [22]. Within this framework, perceived usefulness and perceived ease of use operate as primary cognitive determinants that shape users' evaluative attitudes and behavioral intentions, which subsequently translate into observable system utilization. To enhance contextual adaptability, the model has been progressively extended through the incorporation of external variables tailored to specific technological environments. Extensive empirical evidence, particularly in educational contexts, consistently demonstrates TAM's predictive robustness and analytical reliability in explaining technology acceptance [23], [24], [25]. Its sustained empirical validation underscores its effectiveness as a dominant evaluative framework in technology adoption research. Building upon this foundation, Venkatesh later introduced the Unified Theory of Acceptance and Use of Technology (UTAUT) as a more integrative advancement of acceptance modeling.

3 MATERIALS AND METHODS

This study is an SLR, which provides an overview of several publications related to the topic discussed in a single paper [26], [27]. The primary focus is the application of the TAM in assessing systems and technologies within the Indonesian

education sector. All data were sourced from an accredited and government-managed academic journal platform administered by the Ministry of Education and Culture of the Republic of Indonesia, namely the Science and Technology Index (Sinta). Sinta functions as a national research database and scholarly indexing portal that provides access to accredited journals through its official platform https://sinta.kemdikbud.go.id/. In addition, the portal reports institutional performance indicators in science and technology, as well as the research productivity of faculty members and scholars across Indonesia. The accreditation system is structured into six tiers, ranging from Sinta 1, representing the highest level of recognition, to Sinta 6, indicating the entry-level accreditation category. All accreditation tiers, from Sinta 1 through Sinta 6, were included in the search criteria (see Figure 1). The selected subject areas were education, science, and engineering.

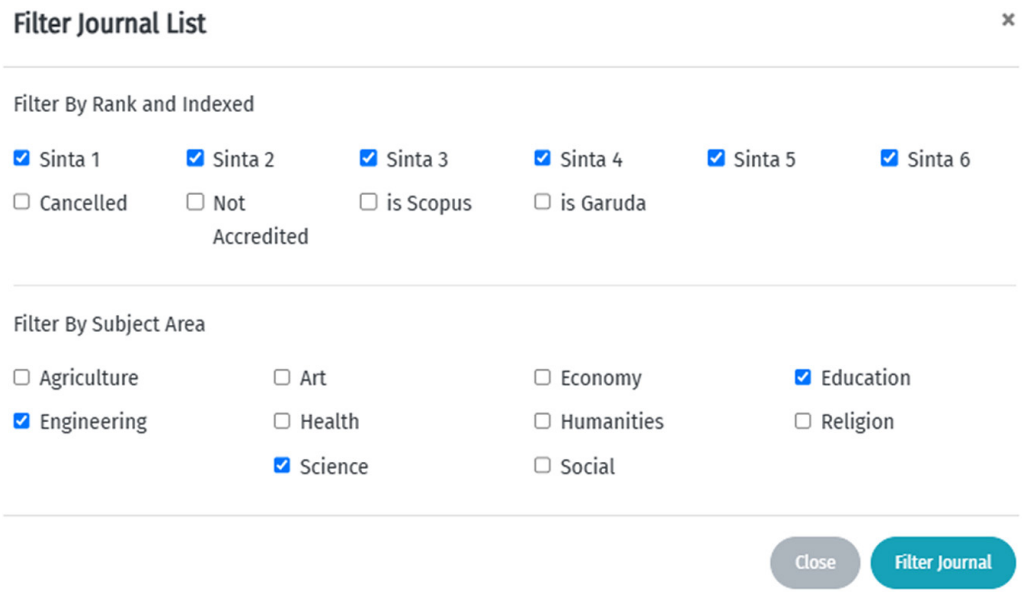

Fig. 1. Journal filter

Following the initial screening stage, the identified journals were accessed through their official websites. The keyword "*technology acceptance model*" was entered into each journal's search function to retrieve relevant publications. Articles meeting the preliminary criteria were then downloaded for further evaluation. The next phase involved a detailed screening process in which the titles and abstracts of each article were systematically examined. This step was intended to ensure alignment with the research objectives and the specific research questions. Although Indonesian scholars authored some studies, those conducted outside Indonesia were excluded from consideration. In addition, systematic literature reviews (SLRs) and meta-analyses that did not report primary empirical or experimental findings were omitted, as they provided secondary data. Studies grounded in theoretical frameworks other than TAM, as well as articles from disciplines beyond education, were also excluded. All publications that met these inclusion criteria advanced to the subsequent review stage, as illustrated in Figure 2.

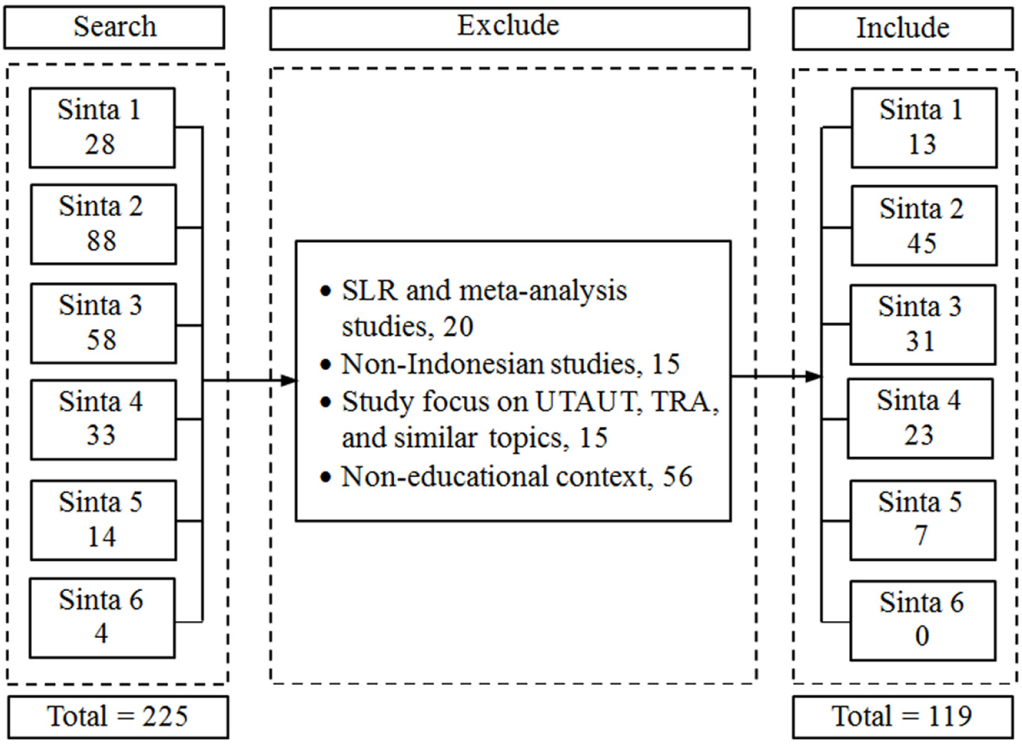

Fig. 2. The scheme for searching relevant articles

Figure 2 presents the initial screening process of articles retrieved from Sinta. Of the 225 studies downloaded after reviewing the identified journals, 106 were excluded for not aligning with the research objectives, leaving 119 for further analysis. During the data extraction phase, several key variables were systematically documented, including publication year to trace research trends and the developmental trajectory of TAM, the types of systems or technologies examined to identify the most widely implemented applications in education, characteristics of research participants to describe demographic profiles and disciplinary alignment, journal accreditation status to determine publication patterns, geographical distribution to map the regional spread of TAM research across provinces, and external variables to identify consistent predictive factors. Collectively, these elements establish a structured framework for evaluating the progression and implementation of technology within Indonesia's education sector.

4 RESULTS AND DISCUSSION

RQ1: How has TAM research evolved in evaluating technology adoption within Indonesia's educational sector?

The research question concerns how the early development of TAM has evolved to its current state in evaluating technology in education. Of the 119 studies reviewed, the distribution of publication years is shown in Figure 3.

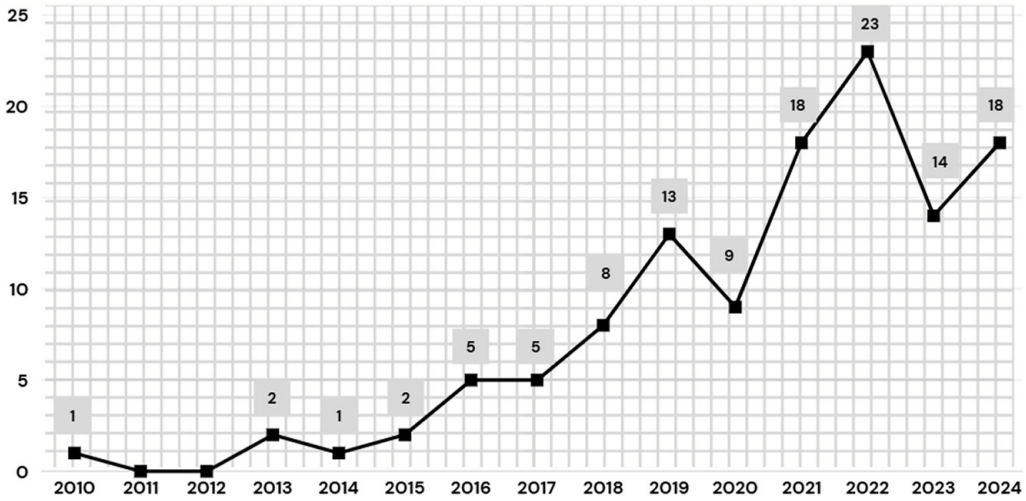

Fig. 3. Development of TAM research in Indonesia

Based on Figure 3, the application of the TAM theory in research began in 2010, with one publication marking the start of evaluating systems or technologies in Indonesian education. A complete absence of publications characterized the subsequent two-year interval. This gap reflects a temporary stagnation in scholarly engagement with technology adoption. Beginning in 2013. Research grounded in the TAM began to display a sustained upward trajectory. This development culminated in a significant surge in 2022. The peak coincided with the far-reaching global disruption generated by the Covid-19 pandemic [28]. The outbreak first emerged in late 2019. Its transformative consequences became fully visible two to three years later during this pivotal period. Educational systems underwent profound structural reconfiguration in Indonesia and worldwide. Students shifted collectively into digitally mediated learning environments. Communication platforms were rapidly transformed into formal instructional infrastructures. Empirical findings also demonstrate that technological utilization extended beyond instructional delivery [29]. It penetrated assessment practices and reshaped evaluative frameworks.

TAM publications during this period indicate that users strongly experienced perceived ease of use and perceived usefulness. These determinants significantly shaped user perceptions and acceptance of technology. Several studies further indicate that although many students and teachers initially struggled with the transition to online learning, they gradually began to recognize and experience the long-term benefits of technology use [30]. The experience ultimately reinforced their intention to sustain technology adoption, and it continues to evolve within post-pandemic education [31]. Evidence from 2023 to 2024 indicates that technological utilization remains widespread. Face-to-face instruction has resumed, yet digital integration persists as a significant component of contemporary educational practice.

RQ2: Which systems or technologies are most frequently examined using the TAM framework in Indonesian education?

The status of the system or technology under evaluation refers to the phase in which the technology has been implemented in real-world settings and is actively used, with its functional complexity experienced by end users. To measure adoption, a structured evaluation assesses the extent to which the technology delivers measurable benefits, ensures usability, and supports projections of long-term sustainability.

The results drawn from 119 empirical studies employing the TAM are presented in Figure 4.

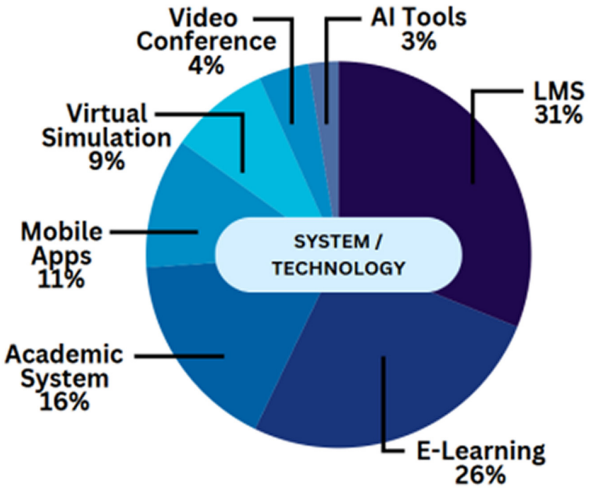

Fig. 4. Systems and technologies

The most extensively implemented technological system is the LMS (31%). According to [32], LMS is a digital platform designed to facilitate comprehensive learning management. It includes structured topics for each session, student attendance monitoring, distribution of instructional materials, and assessment and evaluation mechanisms. Further argues that the wide range of services offered by LMS platforms contributes to their extensive integration within educational systems [33]. In Indonesia, LMS applications are predominantly utilized to support formal learning processes. E-learning ranks second in terms of implementation (26%). Although e-learning shares conceptual and functional similarities with LMS, it possesses distinct characteristics that justify its separate classification in this study, whereas academic information systems function as integrated platforms that centralize and manage comprehensive data on students and educators within a unified digital infrastructure. This system also administers student admissions from initial enrollment through graduation and provides access to campus services, including libraries and academic journals [34].

Other implemented technologies include an academic system (16%) and mobile applications (11%). Smartphones serve as primary learning devices, enabling diverse practical applications and being highly accessible. Virtual simulation technologies (9%) are adopted and deliver immersive content, such as augmented and virtual reality, that replicates real-world environments. Video conferencing (4%) is an implementation and function as a virtual meeting modality that simulates face-to-face classroom interaction while serving as a critical instructional solution during the pandemic. The acceptance of artificial intelligence tools (3%) of the total studies, with specific reference to applications such as ChatGPT and related systems.

RQ3: Who are the most frequently targeted research subjects in TAM-based studies in Indonesian education, and what are their main characteristics?

The subjects most frequently targeted in technology implementation were identified in this section. Identifying the characteristics of these subjects helps clarify the

focus of technology implementation and determine which user groups receive the highest level of intervention. The results of this analysis are presented in Figure 5.

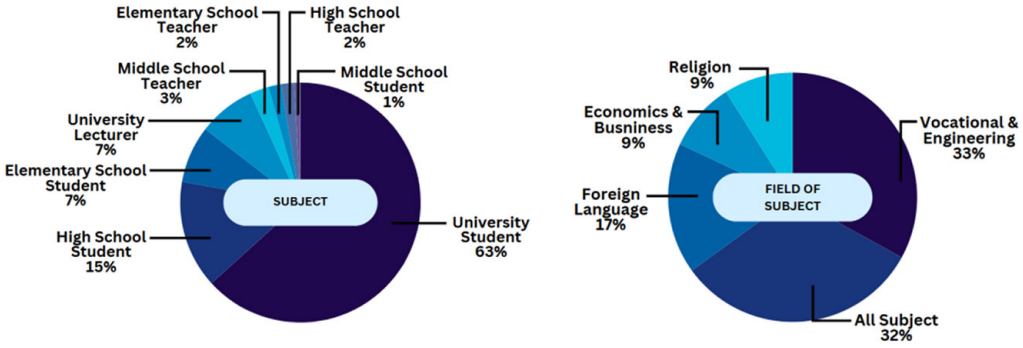

Fig. 5. Subjects and fields

All educators and students across educational levels have been included as targets of technology evaluation. Based on the review, university students represent the most frequently examined subjects (63%). This confirms that the TAM has been predominantly applied to higher education contexts. In comparison, high school students (15%), elementary school students (7%), university lecturers (7%), middle school teachers (3%), elementary school teachers (2%), high school teachers (2%), and middle school students (1%). These figures indicate that university students constitute the largest proportion of technology users examined in the literature, significantly exceeding other educational groups. University students are generally being prepared for the workforce and are exposed to a higher volume of academic activities than other groups, which may explain their prominence in TAM-based studies. However, the evaluation of educators, although less frequently represented, remains essential to ensure the effective delivery of knowledge and the successful integration of technology into instructional practices.

The field of study also emerges as an important dimension of analysis. Vocational and engineering education (33%), followed closely by general education (32%). Other fields include foreign languages (17%), economics and business (9%), and religion (9%). The relatively higher proportion of vocational and engineering education may be attributed to its direct engagement with technological design and application [35]. Nevertheless, the substantial representation of general education underscores its important role in disseminating the theoretical foundations of technology. Interestingly, TAM-based technology implementation and evaluation are not limited to technology-intensive disciplines but are also evident in foreign language education, economics, business, and religious education, demonstrating the model's broad applicability across diverse academic fields.

RQ4: In what types of accredited journals is TAM research in Indonesian education most commonly published?

As with international journal ranking systems, research standards in Indonesia are also classified into tiered publication levels. Nearly all journal ranking categories have published TAM-based research. Identifying the ranking levels of journals that address technology adoption provides insight into the credibility of the reviewed articles. The results of this analysis are presented in Figure 6.

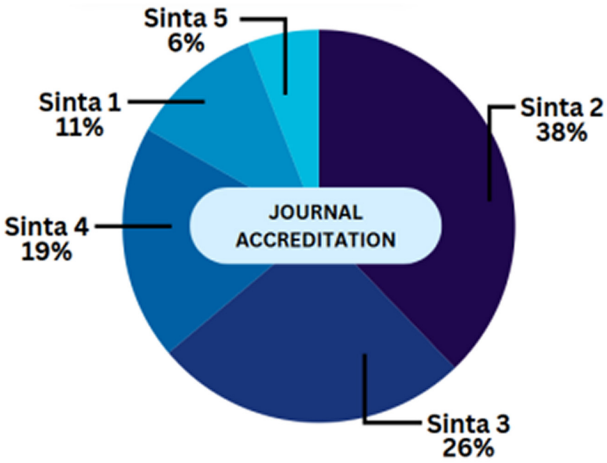

Fig. 6. Distribution of journals

Based on the analysis, the distribution of journals that publish TAM research shows that Sinta 2-accredited journals dominate (38%) of the total publications. TAM research in education is largely published in high-reputation journals in Indonesia. Journals with Sinta 3 accreditation are in second place (26%), followed by Sinta 4 (19%) and Sinta 1 (11%). Sinta 5 accounts for 6%, suggesting that TAM research in education tends to be published in journals with medium- to high-accreditation levels. TAM research is regarded as high-quality research in Indonesia. Its effectiveness in evaluating user perceptions is clearly demonstrated, further strengthening TAM's position as a theoretical framework. TAM can be sustained as a robust and mature theory if it is consistently applied over the long term. The accumulated findings further reinforce the validity of TAM, establishing it as a reliable and relevant theoretical framework.

RQ5: How is TAM research geographically distributed across provinces in Indonesia?

A total of 119 published studies were identified and distributed across multiple provinces in Indonesia. This geographical spread demonstrates that TAM-based research in education is not concentrated in a single region but conducted in various parts of the country. To provide a clearer overview of this distribution, Figure 7 presents a map showing the number of publications per province.

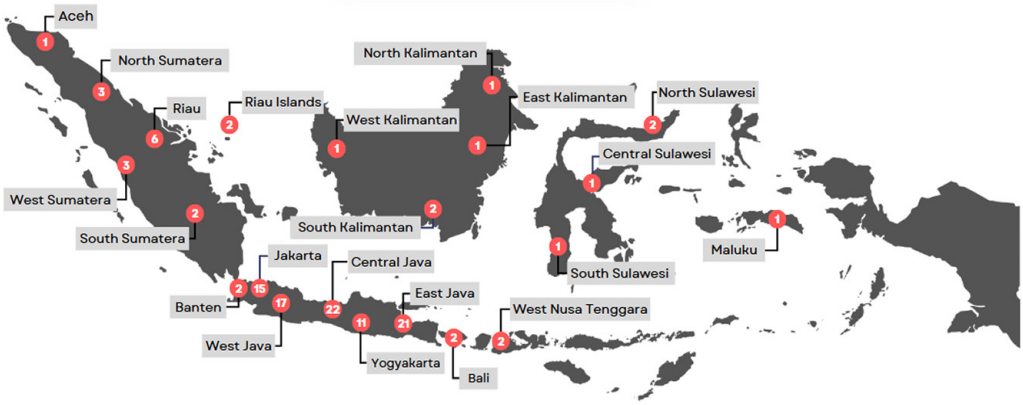

Fig. 7. Map of TAM research in Indonesian provinces

The geographical distribution of TAM research across Indonesia remains uneven. A substantial proportion of studies is concentrated on the island of Java, particularly in Central Java, East Java, and West Java, which record the highest number of publications. This concentration corresponds with the higher level of technology adoption in educational institutions within these regions. As Indonesia's primary center of economic activity, education, and technological development, Java demonstrates a more advanced integration of digital technologies than other parts of the country [36], [37]. From a structural perspective, this uneven distribution may be associated with the persistent digital divide between Western and Eastern Indonesia. Regions with limited technological infrastructure, restricted internet accessibility, and fewer higher education institutions may face challenges both in implementing educational technologies and in conducting empirical research on technology adoption [38], [39]. These disparities suggest that TAM research in Indonesia is closely linked to regional readiness in digital transformation.

While infrastructural and institutional limitations offer a plausible explanation, the lack of studies in certain regions may also indicate differences in policy priorities, research funding allocation, and academic collaboration networks. Therefore, the uneven regional distribution of TAM research not only reflects variations in technology adoption but also points to broader inequalities in research development across Indonesia.

RQ6: What external variables have been integrated into the TAM framework in Indonesian education studies, and which variables most consistently demonstrate a significant influence on technology acceptance?

TAM research conducted in Indonesia demonstrates considerable diversity in the integration of external factors into the model. To enable deeper meta-analytic interpretation, external variables were categorized into three conceptual domains, i.e., individual cognitive and affective factors (self-efficacy, intrinsic motivation, perceived enjoyment, and technology anxiety) [40], social and normative factors (subjective norm and social influence) [41], and system and service quality factors (system quality, and service quality) [42], [43]. The results of the TAM external variable analysis are presented in Table 2.

Table 2. Synthesis of external TAM variables

External Variable	Frequency (n)	Significant (n)	Significance Ratio (%)	Practical Priority Level
Self-Efficacy	43	32	74.4%	High
System Quality	28	17	60.7%	Moderate
Perceived Enjoyment	21	18	85.7%	High
Subjective Norm	15	9	60%	Moderate
Social Influence	13	11	84.6%	High
Service Quality	11	8	72.7%	High
Intrinsic Motivation	11	10	90.9%	High
Technology Anxiety	4	1	25%	Low

Across 119 reviewed articles, researchers identified 146 hypotheses related to external determinants, indicating that many studies integrated several outside

variables into a single investigative framework rather than restricting their analysis to the core TAM model. Therefore, the reported frequencies represent the cumulative number of tested associations involving external constructs throughout the surveyed literature. The analysis indicates that self-efficacy was the most frequently examined external variable, with 43 hypotheses tested and 32 found to be statistically significant. This yields a significance rate of about 74.4%, highlighting self-efficacy as a relatively stable and reliable predictor of system or technology adoption. In addition to self-efficacy, perceived enjoyment (85.7%), social influence (84.6%), service quality (72.7%), and intrinsic motivation (90.9%) demonstrate consistently strong proportional effects on technology acceptance, with intrinsic motivation and perceived enjoyment showing particularly high levels of statistical stability despite being examined less frequently than self-efficacy. These findings suggest that affective engagement and internally driven motivation constitute highly consistent explanatory mechanisms within extended TAM applications. By contrast, system quality (60.7%) and subjective norm (60%) exhibit moderate levels of empirical consistency, indicating that while structural system characteristics and normative expectations contribute to acceptance, their influence appears more context-dependent and less uniformly robust. Technology anxiety, with a prevalence of 25%, shows limited empirical support and does not emerge as a stable predictor across the reviewed studies.

To strengthen the interpretation of the synthesized external variables, a methodological appraisal of the 119 reviewed studies was undertaken. The findings indicate that Indonesian TAM research demonstrates a moderate degree of methodological maturity. Quantitative approaches (84%), mixed-method designs (10.1%), and qualitative studies (5.9%). In terms of analytical techniques, PLS-SEM (39.5%), descriptive quantitative (19.3%), linear regression (14.3%), CB-SEM (10.9%), descriptive quantitative and qualitative (10.1%), and descriptive qualitative (5.9%). Regarding sampling strategies, random sampling (45.9%), purposive sampling (42.6%), convenience sampling (8.2%), voluntary sampling (1.6%), and total sampling (1.6%). Overall, while the field reflects considerable statistical rigor and methodological development in model testing, the distribution of sampling approaches indicates continuing challenges in achieving broader representativeness across educational populations in Indonesia. Despite the observed methodological development, certain limitations remain evident. The substantial reliance on non-probability sampling techniques (52.4%) indicates a moderate risk of selection bias and limited representativeness. Moreover, the predominance of cross-sectional designs constrains causal inference and temporal validation within the TAM framework. Although many studies employ advanced techniques such as PLS-SEM and CB-SEM, statistical sophistication does not offset limitations in research design and sampling. Therefore, while the cumulative evidence supports the relevance of extended TAM constructs in Indonesian educational settings, the robustness of these conclusions depends on future studies that employ probabilistic sampling and longitudinal designs to strengthen external validity.

Taken together, the design of educational systems or technologies should not focus solely on technical and functional aspects. However, it must also enhance users' self-efficacy, foster perceived enjoyment, be supported by positive social influence, ensure service quality, and stimulate intrinsic motivation. However, despite the consistent significance of these variables, the methodological appraisal indicates that the evidence cannot yet be considered fully definitive due to limitations in sampling representativeness. Indonesian TAM research appears to be in a consolidation phase, marked by theoretical expansion and an increasing use of SEM-based

approaches, during which constructs such as self-efficacy and intrinsic motivation have emerged as contextually established predictors of technology acceptance. Nevertheless, the predominance of non-probability sampling and cross-sectional designs limits broader generalization. Future research should therefore prioritize probabilistic, longitudinal, and multi-site designs to strengthen external validity and reinforce the empirical robustness of TAM findings in Indonesia.

5 CONCLUSION

Research discussing the TAM theoretical framework in Indonesian education has developed since 2010. Indirectly, this indicates that the evaluation of technology adoption had already become a concern at that time. Most evaluations were conducted on LMSs. The research subjects who received the most intervention were university students, particularly in vocational and engineering fields. This consistency provides examination and validation that TAM remains firmly rooted in higher education contexts that are closely related to technological practice. The dominance of highly ranked national journals further demonstrates the credibility of TAM as an evaluation framework. However, the geographical imbalance of research in Central Java, with no recorded publications from Papua, raises concerns about inequality in technology implementation. This finding should serve as a practical guide for the government to take corrective actions to promote more equitable technology distribution. In addition, self-efficacy emerges as the most influential determinant. This also provides a valuable recommendation: technology should not be developed solely from a technical perspective; users' psychological aspects must also be considered.

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