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What drives the post-adoption use of educational technologies in higher education? An exploratory systematic review

¿Qué impulsa el uso posterior a la adopción de tecnologías educativas en la educación superior? Una revisión sistemática exploratoria

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ABSTRACT

Although considerable attention has been paid to investigating the initial acceptance and adoption of educational technologies in higher education by teachers, it is much less certain whether these technologies become a sustained part of teaching practice. In an attempt to address such a gap, this exploratory systematic review examined the factors associated with post-adoption use of educational technology among university faculty, distinguishing between intention to continue use, implementation, and discontinuation, whether reported as continuous or deep. This article searched the ERIC, OpenAlex, and Crossref databases for peer-reviewed empirical studies in English published between 2015 and 2026. The search resulted in fifty-five comprehensive reports for evaluation, of which only twenty met the inclusion criteria. Given the diversity of technologies, outcomes, and methods, the findings were synthesized narratively. Four recurring domains emerged: pedagogical value and task-technology fit; system satisfaction, confirmation, and quality; teacher competence, autonomy, and affection; and institutional and social factors. Use or intention after adoption was associated with perceived pedagogical value, system quality, competence, autonomy, institutional support, time, recognition, and student engagement. Barriers included technostress, privacy concerns, inadequate infrastructure, maladaptation, and mandatory use. As the evidence base was largely dominated by cross-sectional self-report studies on continuity intention, conclusions about sustained behavior should be interpreted with caution.

Keywords: *educational technology; higher education; university professors; post-adoption use; intention of continuity; technological integration; exploratory systematic review.*

RESUMEN

Aunque se ha prestado considerable atención a investigar la aceptación inicial y la adopción de tecnologías educativas en la educación superior por parte de los docentes, mucho menos seguro es si estas tecnologías se convierten en una parte sostenida de la práctica docente. En un intento de abordar tal brecha, esta revisión sistemática exploratoria examinó los factores asociados con el uso posterior a la adopción de tecnología educativa entre profesores universitarios, distinguiendo entre la intención de continuar con el uso, la implementación y la discontinuación, ya sea que se reporten como continuos o profundos. Este artículo buscó en las bases de datos ERIC, OpenAlex y Crossref estudios empíricos en inglés revisados por pares publicados entre 2015 y 2026. La búsqueda dio lugar a cincuenta y cinco informes completos para evaluación, de los cuales solo veinte cumplían los criterios de inclusión. Dada la diversidad de tecnologías, resultados y métodos, los hallazgos se sintetizaron narrativamente. Surgieron cuatro dominios recurrentes: valor pedagógico y ajuste tarea-tecnología; satisfacción, confirmación y calidad del sistema; competencia, autonomía y afecto docentes; y factores institucionales y sociales. El uso o la intención tras la adopción se asociaron con un valor pedagógico percibido, calidad del sistema, competencia, autonomía, apoyo institucional, tiempo, reconocimiento y compromiso estudiantil. Las barreras incluían tecnoestrés, preocupaciones sobre la privacidad, infraestructura inadecuada, mala adaptación y uso obligatorio. Como la base de evidencia estuvo dominada en gran medida por estudios transversales de autoinforme sobre la intención de continuidad, las conclusiones sobre el comportamiento sostenido deben interpretarse con cautela.

Palabras clave: *tecnología educativa; educación superior; profesores universitarios; uso posterior a la adopción; intención de continuidad; integración tecnológica; revisión sistemática exploratoria.*

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INTRODUCTION

The incorporation of digital platforms, LMS, online assessment tools, smart classes, and video conferencing systems is now an integral part of higher education (Bond et al., 2020; Lidolf & Pasco, 2020; Sum & Oancea, 2022). However, the mere presence of technology does not necessarily mean that it has been adopted in the teaching process. A teacher may attempt to use a technology platform due to the requirements of the institution, in an emergency, or even after having gone through an extremely short training process, and then return to what they were used to. Technology adoption is distinct from technology integration, as technology integration occurs when the teacher tests the technology, while integration takes the form of a continuous and deliberate use of the technology after it has been tested.

Recognizing this difference is essential for higher education institutions. In fact, only when teachers use technology in such a way that it remains relevant in their classrooms does the money invested in platforms, infrastructure, and professional development bring educational value. Research on discontinuation also debunks the misconception that discontinuation equals failure. There are a variety of reasons why a teacher may stop using a technology, including unreliability, substitution by another technology, inappropriateness for teaching, and the burden it poses. According to Shelton (2017), discontinuation could be explained by a failed experience, changes in the environment, or professional discretion.

There are several theories that attempt to explain aspects of this phenomenon. To name a few, the technology acceptance model focuses on perceived utility and ease of use (Davis, 1989). The unified theory of technology acceptance and use incorporates perceived social influence and facilitating conditions (Venkatesh et al., 2003). As for the expectation confirmation theory, experience validates or falsifies expectations and leads to the formation of perceptions of usefulness, satisfaction, and intentions to continue using technology (Bhattacherjee, 2001). Such theories are useful in explaining this phenomenon, although higher education is more than pedagogical judgment and disciplinary practices. Post-adoption research also warns that intention and continued behavior are related, but not equivalent, as habitual or prolonged use may develop differently from stated intention (Jasperson et al., 2005; Limayem et al., 2007).

Previous reviews have explored edtech implementation and teacher professional development (El Guermat, 2026; El Guermat et al., 2025), and the literature that emerged during the pandemic described the rapid shift to *online* instruction (Lidolf & Pasco, 2020; Sum & Oancea, 2022). However, little importance has been placed on the processes that unfold once an initial implementation begins. As such, the current review raises the following questions: (1) what teaching, technological, pedagogical, student, and institutional factors facilitate or hinder the sustained integration of edtech into higher education?; (2) how has sustainability been defined and measured?; (3) what implications can be drawn from the findings? Therefore, the aim of this review was to synthesize the factors associated with the use of educational technology by university professors after adoption, to clarify how post-adoption outcomes have been defined and measured, and to identify implications for higher education practice and research.

METHOD

Design Review and Eligibility

This exploratory systematic review was documented in accordance with PRISMA 2020 (Page et al., 2021), PRISMA-S (Rethlefsen et al., 2021), and the Synthesis without Meta-Analysis (SWiM) guideline (Campbell et al., 2020). An internal protocol established the research question, eligibility criteria, sources, and extraction fields prior to the screening process. This protocol was not previously registered. PROSPERO was not considered a suitable database for registration due to the nature of this educational review, in which a health outcome was not directly examined (Pieper & Rombey, 2022). A general database such as the Open Science Framework was not used for registration prior to screening. Retrospective registration was also not applied, as this would not demonstrate that the methods were prospectively determined (see Table 1).

Information and search sources

ERIC, OpenAlex, and Crossref began searching in July 2026. These databases were selected in particular because they included a specialized educational index along with comprehensive metadata services for students. The search concepts included a post-adoption word (intent to continue, continued use, sustained use, post-adoption, discontinuation, dropout, or continued use), an edtech word (edtech, *e-learning*, online teaching,

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Table 1
Eligibility Criteria

Criteria	Included	Excluded
Population	Professors, professors, professors, or university academic staff; mixed samples only when the evidence of the faculty was central or separable.	Exclusive populations of students; school teachers; administrators without a teaching role.
Phenomenon	Continued use, intent for continuity, sustained implementation, post-adoption use, deeper use of features, or discontinuation of technology used for teaching.	Initial acceptance, preparation or single adoption with no result after adoption.
Technology	LMS, online/blended teaching platforms, assessment technologies, smart classrooms, and similar educational technologies.	Administrative systems or general digital skills without educational technology.
Evidence	Peer-reviewed qualitative, quantitative or mixed-methods empirical research, 2015-2026.	Reviews, conceptual articles, protocols, editorials, non-peer-reviewed items, or insufficient study information.

Information and search sources

blended platform, or learning management system), and a word for college professors (professor, professor, instructor, academic, or college professor). Searches were modified based on the specific interface. Examples included "intent to continue" AND "edtech" AND "college professors"; "continued use" AND "college professors"; and "sustained use" AND "technology" AND "university teaching". Searches of databases and complementary methods yielded a total of 2311 records, including four identified through reference lists and searches by exact title/DOI. Records and decision-making were documented in a structured spreadsheet.

Metadata exports produced a maximum of one hundred search-ranked records in OpenAlex and Crossref and up to two hundred in ERIC. OpenAlex and Crossref are general databases of scholarly metadata rather than direct counterparts to curated citation indexes. The limits, combined with the absence of Scopus, Web of Science, PsycINFO, and other regional indexing services in Spanish, could have restricted the number of records retrieved, especially those not widely indexed or in languages other than English. For that reason, the review analyzed the literature identified using the aforementioned resources.

Selection, extraction and appraisal

Registries were standardized and duplicates were removed based on their DOIs and titles. The latter and abstracts were first assessed for conformity with predefined inclusion criteria, and those records with potential relevance were subsequently assessed by full-text review. A data extraction sheet was used to document the country, target population, technology, research design, theoretical perspective, sustainability effect, and factors that facilitate or hinder this effect. Registries with doubtful eligibility and studies included in the synthesis were then reviewed again against the predefined criteria and original reports. This additional screening served to ensure consistency in filtering and coding; however, they did not involve independent duplication and consequently an agreement between evaluators could not be calculated. Given the absence of independent screening for duplicates, this restriction is reflected in the exploratory designation of the review.

The methodological quality of the included articles was assessed using the Mixed Methods Appraisal Tool (MMAT), 2018 version (Hong et al., 2018). The studies were critically assessed based on the set of criteria that corresponded to the type of methodology used by each study, whether qualitative, quantitative or mixed-methods. According to the MMAT guideline, an overall numerical score was not calculated because a single score may mask different methodological weaknesses (Hong et al., 2019). Instead, Table 2 reports the main findings of the study-level assessment. In synthesis, findings with clearer methodological limitations were interpreted with caution and were not used alone to support overall conclusions. Patterns supported by multiple studies or methods were given greater interpretive weight. No study was excluded solely on the basis of quality.

Summary

No meta-analyses were performed due to heterogeneity between the technologies used, the outcomes studied, the theoretical constructs, the measures employed, and the participants' samples, as well as the lack of a sufficiently comparable set of effect estimates. Instead, a narrative synthesis was

Table 2
Summary of MMAT Appraisal by Study

Study	MMAT Category	Main appraisal finding	Influence on synthesis
Mouakket & Bettayeb (2015)	Quantitative descriptive	Cross-sectional self-report; sampling in a single context and notification of non-response limit representativeness.	Interpreted with caution; used as a source within converging patterns.
Shelton (2017)	Qualitative	The approach, analysis, and interpretation of the interview were consistent; transferability is limited by the small contextual sample.	It is mainly used for the contextual explanation of interruption and professional judgment.
Al-Samarraie et al. (2018)	Mixed/Combined Methods	Very small subset of instructors within a mixed instructor/student sample; faculty-specific inference is limited.	Findings relevant to teachers are preserved, but not used separately for general statements.
Nair (2022)	Quantitative descriptive	Small sample of teachers; representativeness and lack of response are concerns, although the measures and analyses were adequate for the question.	Interpreted with caution and compared to larger studios.
Almogren (2022)	Quantitative descriptive	Cross-sectional self-report and context-specific sampling restrict behavioral and causal inference.	It is used only for associations with the intention of continuity.
Kaqinari et al. (2022)	Quantitative descriptive	Analysis of large samples and appropriate profiles; cross-sectional self-report continues to limit temporal inference.	A moderate interpretative weight is given to recurrent factors of teachers or institutions.
Al-Freih (2022)	Quantitative descriptive	Cross-sectional survey of teachers; the implementation conditions were self-reported and context-bound.	It is used for deployment conditions rather than sustained behavior testing.
Mithras (2022)	Mixed-methods action research	Integration of methods supported contextual interpretation; small intervention sample and lack of long-term follow-up limit sustainability claims.	Used as evidence of implementation, not as evidence of long-term efficacy.
Mtebe & Gallagher (2022)	Mixed methods	Sequential explanatory design supported the integration of survey and qualitative evidence; single-institution results and intention-based outcomes remain limitations.	Moderate weight is given to converging post-adoption factors
Song et al. (2023)	Quantitative descriptive	The small response sample and the mixed secondary/tertiary population reduce the representativeness for university professors.	It is used cautiously and only when the evidence relevant to the faculty was separable.
Ye (2023)	Quantitative descriptive	adequate sampling and statistical analysis; cross-sectional self-report limits temporal and causal inference.	It is used for associations between constructs after adoption, not causality.
Kamali et al. (2024)	Quantitative descriptive	Cross-sectional self-report with intention as the main result.	It is used only for recurring motivational associations.
Şahin et al. (2025)	Quantitative descriptive	Cross-sectional self-report and intention-based outcomes limit behavioral inference.	It is used for recurrent motivational/affective associations.
Xiao et al. (2024)	Quantitative descriptive	Cross-sectional self-report; the relationships between privacy and satisfaction are associative rather than longitudinal.	Used for recurring system/privacy factors.
Li (2024)	Quantitative descriptive	A large but region-specific, cross-sectional, self-reported sample.	It is given a moderate weight by satisfaction/system factors, with contextual caution.
Du & Phongsatha (2025)	Quantitative descriptive	Cross-sectional self-report of the intention of continuity; the temporal order cannot be established.	It is used for recurring compatibility/satisfaction associations.
Murire & Gavaza (2025)	Qualitative	Coherent interview/thematic approach; results are context-specific and based on a small sample.	It is used to explain contextual barriers and support needs.
Alqabandi & Durugbo (2026)	Quantitative descriptive	Cross-sectional self-report of intention; behavioral persistence was not directly observed.	It is used for recurrent safeguards/cognition.
Alfoudari & Durugbo (2026)	Quantitative descriptive	Cross-sectional self-report of intention; the relationships between service quality and technostress are associative.	It is used for recurring service quality/techno-stress factors.
Gao et al. (2026)	Qualitative	Clear design of case studies, semi-structured interviews, saturation and thematic analysis; the environment of a single institution limits transferability.	It is given a strong contextual weight for routine use versus passive compliance, not for prevalence.

performed according to SWiM reporting principles. Findings were coded using the terminology of each study, compared, and categorized into higher-order domains. It was termed a narrative synthesis with thematic clustering, not a qualitative thematic synthesis. Contradictory and non-significant findings were maintained in the analysis. A distinction was made between intentions and actual behavior. Discontinuation was treated as an option and not as a failure *per se*.

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RESULTS

Study selection

The searches identified 2311 records. Following the removal of 310 duplicates, 2001 records entered title and abstract selection. Of these, 1946 were excluded, leaving fifty-five full reports for eligibility assessment. Thirty-five full texts were excluded because they involved student-only samples (n = 16); focused solely on initial adoption or preparation (n = 10); were non-empirical articles, reviews, or protocols (n = 4); did not involve higher education faculty (n = 3); or provided insufficient information (n = 2). Twenty studies were included in the narrative synthesis. Figure 1 presents the selection flow of PRISMA 2020 studies.

Defining and Measuring Post-Adoption Outcomes

The included studies did not use a single definition of sustainability. As Table 3 shows, most operationalized the phenomenon through continuation intent or closely related self-reported constructs, while fewer examined deeper or continued use, implementation, behavior, or discontinuation. Thus, intention and behavior remained analytically distinct throughout the synthesis.

Figure 1
PRISMA 2020 Flowchart

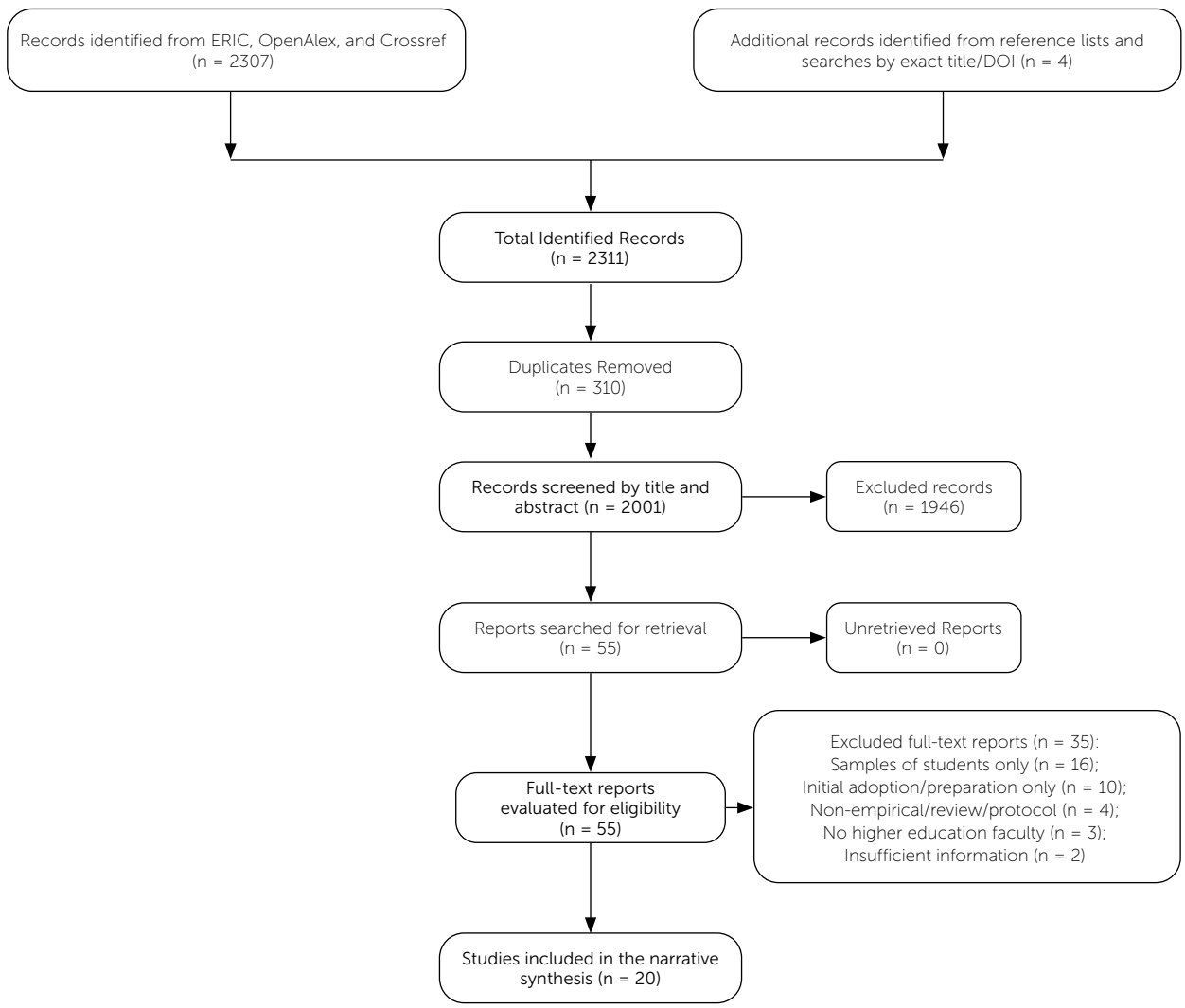


Table 3
Defining and Measuring Post-Adoption Outcomes

Post-adoption outcome	Studies	How it was measured	Interpretation in this review
Intent to lengthen/ satisfaction to defer	Mouakket & Bettayeb (2015); Al-Samarraie et al. (2018); Almogren (2022); Mtebe & Gallagher (2022); Song et al. (2023); Kamali et al. (2024); Şahin et al. (2025); Xiao et al. (2024); Li (2024); Du & Phongsatha (2025); Alqabandi & Durugbo (2026); Alfoudari & Durugbo (2026); Gao et al. (2026)	Mainly cross-sectional surveys and statistical models; Al-Samarraie et al. (2018) used an interview-based survey/ DEMATEL approach, and Gao et al. used qualitative interviews.	Evidence of intentional or perceived continuation, not direct evidence of long-term behavior.
Use profiles and future intent	Kaqinari et al. (2022)	Survey with latent class profiling on the use and intention of the technology.	Behavioral profiling provides context, but future continuation remains intent-based.
Intent plus self-reported behavior	Ye (2023)	Survey/cross-sectional model that includes continuation intent and reported usage behavior.	More proximal observation of behavior, but not longitudinal.
Deeper Usage/ Deployment/ Continued Usage Reported	Nair (2022); Al-Freih (2022); Mitra (2022); Murire & Gavaza (2025)	Survey on the most in-depth use of LMS features; survey of implementation conditions; mixed-methods action research; qualitative interviews on continued use.	Closer to a used carried out, although the evidence remains largely self-reported or short-term.
Discontinuation	Shelton (2017)	Qualitative interviews on stopping, replacing or abandoning technologies.	It directly examines cessation and treats suspension as a possible reasoned outcome.

Characteristics of the included studies

The geographic evidence base was broad, but the largest number of studies came from the Asia and Middle East regions. Some of the countries where the research was conducted included China, Saudi Arabia, Gulf Cooperation Council (GCC) countries, Malaysia, Tanzania, Turkey, the United Arab Emirates (UAE), the United Kingdom, and the United States. Fifteen studies were conducted using cross-sectional quantitative designs, while three others employed qualitative designs and two others used mixed methods or action research designs. The most researched technologies included learning management systems and *e-learning* sites. Other technology environments studied included online tests, smart classrooms, live *e-learning*, and discipline modeling software. Sample sizes ranged from eleven teachers in qualitative interviews to 796 in a multinational study (see Table 4).

Methodological quality and measurement

The main weaknesses of most quantitative articles included cross-sectional designs, single-respondent self-report measures, single-institution convenience sampling or sampling, and use of causality without temporal data. Intention for continuation was much more frequent than behavior or real-time. Some studies had problems with the definition of the population or the terms used: Song et al. (2023) with mixed secondary and tertiary teachers, Al-Samarraie et al. (2018) included both teachers and students and some articles were not consistent in the names of platforms and measurement instruments used. These studies were used only when information about teachers was still valid and their conclusions were critically considered.

In fact, qualitative studies offered contextual explanations that were difficult to obtain from surveys, such as professional agency, institutional practices, and the distinction between voluntary routine and compliance. These studies are characterized by limited sample size and limited transferability. Mixed and action research designs were useful for obtaining triangulation, but failed to demonstrate any lasting impact. Generally, the results can be used to identify recurrent factors and relationships, but they cannot be used to estimate an effect size universally or to identify a cause.

Enablers and barriers

There were four interconnected dimensions that explained how teachers could continue, improve, reduce, or stop using technology. The first was about pedagogical value and task-technology fit. To explain, utility seemed to be the most reliable enabler; however, "utility" was not solely related to the effectiveness of the technology used. Teachers continued to use platforms that were useful for coursework, assessment, and interaction and that were beneficial to students. According to Al-Samarraie et al. (2018), continuation was associated with task-technology fit and information quality. Similarly, Song et al. (2023) found that technology's enabling features in the learning process had more influence than features that facilitated the process

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Table 4
Characteristics of the included studies

Study/context	Design/Sample	Technology/Outcome	Main finding
Mouakket & Bettayeb (2015), UAE	Topography; 158 instructors	Black Slate; Intention	Usefulness and satisfaction predicted continuity; interface, training, and support shaped the experience.
Shelton (2017), England	Interviews; 11 speakers	Various tools; discontinuation	Cessation reflected replacement, failed use, contextual change, and teacher agency.
Al-Samarraie et al. (2018)	Mixed interview/survey; 47, including 9 instructors	Online learning; continuity	The quality of the information and the system, the task-technology adjustment, usefulness and functionality were central aspects.
Nair (2022), Malaysia	Survey; 54 teachers	LMS; deeper use	Confirmation and usefulness supported satisfaction and use of deeper LMS features.
Almogren (2022), Saudi Arabia	Survey; 159 teachers	LMS; intent	Utility, ease, enjoyment, real use and satisfaction were associated with continuity.
Kaqinari et al. (2022), Europe	Survey; 796 speakers	Digital tools; profiles/intent	Self-efficacy and useful institutional support differentiated four usage profiles.
Al-Freih (2022), Saudi Arabia	*Survey*; 168 teachers	Online teaching; implementation	Only half of the eight conditions for implementation of Ely were perceived.
Mitra (2022), United States	Research-action; 15 professors	LMS Assessment; Sustained Use	Faculty-led iterative development increased the use of tools and supported a continuation plan.
Mtebe & Gallagher (2022), Tanzania	Mixed sequential methods	Digital teaching; use after the pandemic	Usefulness and satisfaction interacted with access, cost, knowledge, identity, training and incentives.
Song et al. (2023), multiple institutions	Survey; 42 responses	Modeling tool; intent	Features that supported student learning mattered more than teacher comfort.
Ye (2023), China	Survey; 355 teachers	Online platforms; intent/ behavior	System/service quality and self-efficacy worked through utility and satisfaction.
Kamali et al. (2024)	Survey; 312 teachers	Online platforms; intent	The satisfaction of basic psychological needs and intrinsic motivation supported continuity.
Şahin et al. (2025), Turkey	Survey; 308 instructors	Online/*hybrid tools*; intent	Usefulness and relationship had direct effects; emotional responses were important.
Xiao et al. (2024), China	Survey; 224 teachers	Live online teaching; continuity	Usefulness and satisfaction were positive; concern for privacy disrupted key relationships.
Li (2024), China	*Survey*; 500 speakers	Online teaching; intention	The attributes of the course, the system, and the instructor shaped satisfaction; social influence mattered as well.
Du & Phongsatha (2025), China	Survey; 306 teachers	Combined platform; intent	Satisfaction, attitude, and compatibility were direct predictors; usefulness was indirect.
Murire & Gavaza (2025)	Interviews; 15 academics	Digital technologies; continued use	Training and support were priorities amid contextual barriers to implementation.
Alqabandi & Durugbo (2026), CCG	Topography; 151 instructors	Online assessment; intent	Safeguards and openness shaped cognitive reactions, which supported continuity.
Alfoudari & Durugbo (2026), CCG	Survey; 387 instructors	Smart classrooms; intention	Quality of service promoted connectivity and reduced technological stress; both shaped continuity.
Gao et al. (2026), China	Interviews; 15 EFL teachers	LMS reduction; intention to continue/routine use	Facilitating conditions, habits, social influence, and local teaching norms distinguished routine integration from compliance.

for the teacher. The issue of compatibility was also relevant in Du & Phongsatha's (2025) mixed-platform study. On the contrary, characteristics such as redundancy, less face-to-face interaction or lack of congruence with disciplinary practice hindered continuity.

The second dimension concerned satisfaction, confirmation, and quality of the system. The post-adoption experience was really essential. The confirmation of expectations made usability and satisfaction linked to their continued use (Mouakket & Bettayeb, 2015; Nair, 2022; Xiao et al., 2024). Access, usability, quality of information, and quality of service were the main factors that allowed this confirmation. In the case of the smart classroom, quality of service improved the level of connectivity and decreased the level of technostress (Alfoudari & Durugbo, 2026). Technical issues, cost, poor access, privacy concerns, and a difficult interface made the use of the system more problematic. Ease of use often influenced usability or satisfaction.

Table 5
Synthesis of Enablers and Barriers

Domain	Facilitators	Barriers or precautions
Pedagogical value	Visible learning benefit; task and discipline adjustment; useful assessment/interaction features	Redundancy; weak fit; reduced value interaction
Experience and quality	Confirmation; satisfaction; reliability; usability; quality of information/service	Failures; complexity; poor access; cost; privacy uncertainty
Resources for Teachers	Competence; self-efficacy; autonomy; kinship; enjoyment; habit	Technostress; frustration; low confidence; mandatory compliance
Institutional/social environment	Responsive support; integrated course development; time; recognition; peer and student participation	Punctual training; workload; fragmented politics; pressure without resources

The third dimension was the teacher's ability, autonomy, and affection. Self-efficacy and procedural skills were critical in helping teachers maintain their engagement, especially when the support was related to the course (Kaqinari et al., 2022; Ye, 2023). Enjoyment, relationship, and satisfaction of competence, autonomy, and relationship needs also influenced continuation (Almogren, 2022; Kamali et al., 2024; Şahin et al., 2025). Technological stress, privacy issues, frustration, and loss of meaningful connections were all detrimental negative effects on use. Most importantly, forced use is likely to lead to mere use, but not widespread adoption. According to Gao et al. (2026), there is a difference between active voluntary onboarding and passive compliance, while Shelton (2017) showed that teachers used their professional judgment to stop using some tools.

Finally, institutional and social factors played an important role in defining how teachers would continue to use technology. While the presence of infrastructure and help desks was crucial, it was not enough on its own. Other factors appreciated by teachers included rapid technical assistance, pedagogical professional development, workload recognition, local leadership, appropriate incentives, and consistency in institutional policies. For example, Mitra (2022) established that teacher-led and iterative workshops motivated teachers to use more assessment tools provided by LMSs. Similarly, Mtebe & Gallagher (2022) emphasized the importance of training, accessibility, affordability, professional identity, accreditation, and incentives. Teachers' perception of whether a particular technology was worthwhile depended on the commitment of students and their peers. However, a lack of time, reliable technology, and input from teachers in the face of institutional pressure reduced the possibility of greater engagement with technology (see Table 5).

DISCUSSION

From the above analysis, it is clear that sustained integration appears to be a situated and experienced process rather than a late form of initial acceptance. Prior to actual use, the teacher can only make estimates about the usefulness of the technology, as well as the effort involved. Once the technology has been used, he or she can assess its efficiency, suitability for educational purposes, effectiveness for students, and feasibility under work constraints. This interpretation is consistent with post-adoption theory, which treats continued use as shaped by experience rather than as a simple extension of initial acceptance (Bhattacherjee, 2001; Jasperson et al., 2005; Limayem et al., 2007), and with included studies in which usefulness, satisfaction, and local teaching conditions became central after initial use (Gao et al., 2026; Mouakket & Bettayeb, 2015; Nair, 2022).

A more concise way to explain this is that the use of sustainable technology depends on alignment at four levels. It should be noted that the technology must be reliable and easy to use, but it must also provide evident pedagogical value in education. However, the teacher must have sufficient experience and autonomy, as well as the ability to deal with the challenges related to the use of technology. The institution must also provide the necessary support, including the provision of time, recognition, protection, and reasonable expectations. Finally, student participation is relevant in all these aspects, as it provides direct feedback to teachers on the usefulness of the technology used

in the teaching process. If any of these aspects are weak, the advantages gained at other levels will not materialize. Therefore, even if the technology is reliable, it can be abandoned for lack of pedagogical value. The four-tier alignment identified here also reflects evidence that pedagogical fit, institutional support, and disciplinary context influence the maintenance of technology in practice (Al-Samarraie et al., 2018; Kaqinari et al., 2022; Mercader & Gairín, 2020; Mtebe & Gallagher, 2022; Porter & Graham, 2016).

In addition, the results question the applicability of a simplistic metric for retention. It is not possible to retain all the technology used at once. Technologies are replaced. There are changes in course requirements. Not all technologies may prove suitable after all. What is clear is that it is necessary to discontinue whenever necessary. Institutions must learn from both successes and failures. This supports treating discontinuation as a possible form of professional judgment rather than automatically as a failure of implementation (Shelton, 2017).

At the same time, the included studies paid limited attention to equity conditions that may influence post-adoption use. Digital access is not just a matter of infrastructure; differences in skills, meaningful use, and socioeconomic resources can affect teacher participation (Lythreatis et al., 2022; Soomro et al., 2020). Accessibility for students with disabilities also depends on the design of platforms and materials and teachers' competence in digital accessibility (Bong & Chen, 2024; Seale, 2014). Linguistic diversity received little explicit treatment in the studies reviewed, although language, local content, and support arrangements may influence the relevance and usability of digital technologies in different contexts (United Nations Educational, Scientific and Cultural Organization [UNESCO], 2023). Therefore, these issues should be treated as a lack of evidence and not assumed to have no effect.

Implications for higher education

Given the limitations of the available evidence, institutions can turn to five practical directions. Decisions about acquisition and implementation should start with teaching needs and evidence of benefit to students, and not with the number of features a tool offers. Ideally, faculty should be able to test technologies in real-world course environments before they are more widely adopted. Professional development can also be most useful when introduced gradually, starting with basic access and technical support, followed by assistance in course-based design and subsequent opportunities to explore more advanced features. The studies reviewed further suggest that effective implementation should combine responsive technical support with workload recognition, clear guidance on privacy, and opportunities for peer-to-peer exchange. Assessment should also go beyond login statistics and intent surveys, considering how often technologies are used, for how long, and how significantly they are integrated into teaching. At the policy level, institutions should preserve teacher input and allow tools to be adapted or discontinued where there are strong pedagogical reasons to do so. These guidelines should be understood as evidence-based recommendations and not as universally applicable recommendations, as most of the included studies were based on self-reported intentions within specific institutional contexts. Therefore, their broader applicability should be considered with caution, especially since the review was conducted by a single reviewer and the evidence was concentrated in a limited number of geographic settings. These implications are both institutional and political: acquisition, accessibility standards, privacy norms, workload allocation, and support agreements determine who can meaningfully participate in technology-supported teaching. Therefore, policy should assess equity and pedagogical value alongside adoption rates (Kirkwood & Price, 2014; Selwyn, 2017; Unesco, 2023). Institutional strategies should also treat infrastructure, pedagogical support, accessibility, and teaching agency as linked policy issues rather than separate technical concerns (Mercader & Gairín, 2020; Porter & Graham, 2016).

Research priorities

Future studies should follow faculty across semesters and connect surveys with platform records, course artifacts, observations, and evidence of student learning. These designs can assess the gap between intention and behavior and distinguish routine integration from mandatory activity. Multi-institutional and international-level studies are needed, especially in low- and middle-income underrepresented settings and in Latin America. Researchers should clearly report on technology, discipline, institutional policy, prior experience, and duration. Greater attention should also be paid to discontinuity, replacement, privacy, generative artificial intelligence, and the conditions under which sustained use is educational and beneficial rather than merely persistent.

Limitations

This review has five main limitations. First, the protocol was not prospectively registered, so readers cannot compare the completed review to a time-stamped public plan. Second, filtering, extraction, and evaluation were performed by a single reviewer. The review of uncertain and included records improved consistency, but did not address the absence of independent verification. Third, searches were limited to ERIC, OpenAlex, and Crossref, English-language publications, and limited-range exports of relevance. Scopus, Web of Science, PsycINFO, and regional indexes were not searched, and relevant studies may have been missed. Fourth, the twenty included studies concentrated on Asia and the Middle East, limiting transferability to other systems, including Latin American higher education. Fifth, the evidence base was dominated by cross-sectional research of self-report and intention of continuity. Thus, the synthesis identifies recurrent associations and contextual explanations; It cannot establish causal effects, prevalence or the long-term effectiveness of best practices. A future update should be prospectively recorded, search multilingual and subscription databases, and use independent screening and duplicate extraction. For this reason, the review is presented as exploratory and its conclusions should be interpreted as a structured synthesis of the identified evidence rather than as an independently duplicate evidence verification.

CONCLUSIONS

In the twenty included studies, post-adoption outcomes—most frequently of intention to continue and less frequently reported of continued or deeper use, implementation, or discontinuation—were associated with perceived pedagogical value, reliable systems, manageable demands, and support from institutions and students. Usefulness and satisfaction appeared repeatedly, but their importance varied according to ability, autonomy, social connection, workload, safeguards, infrastructure, and professional support. Discontinuation could also represent a reasoned response to inappropriate or changed circumstances. These findings support a focus on meaningful, context-sensitive integration rather than simple persistence of a platform. However, the small and geographically unequal evidence base, coupled with its reliance on measures of intent, requires cautious interpretation. Longitudinal research is needed to establish what teachers continue to use, under what conditions, and with what educational consequences.

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