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Exploring Factors Influencing Teacher Readiness and Perceptions Towards Digital Learning Technology: A Systematic Literature Review

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Abstract

This study aims to synthesize existing research on the factors influencing teacher readiness and perceptions towards the adoption and integration of digital learning technologies in higher education. The review seeks to identify key personal, pedagogical, institutional, and technological determinants that shape how faculty engage with digital tools in their teaching practice. Drawing from established theoretical frameworks such as the Technology Acceptance Model (TAM), Unified Theory of Acceptance and Use of Technology (UTAUT), and Technological Pedagogical Content Knowledge (TPACK), the review ultimately seeks to inform an integrated conceptual model for future empirical testing. A systematic literature review with qualitative thematic analysis was conducted on peer-reviewed journal articles published in Scopus, Web of Science, ERIC, and Google Scholar between 2010 and 2024.

The review identified six major clusters influencing teacher readiness and perceptions toward digital learning technologies in higher education. Cognitive Readiness emerged as a critical determinant, encompassing teachers' perceptions of usefulness, ease of use, prior experience, and self-efficacy in using digital tools. Pedagogical Readiness highlighted the importance of integrating technology with content and pedagogy. Affective Readiness reflected both the emotional attitudes and anxieties teachers experience when engaging with technology. Institutional Readiness underscored the significance of institutional support through resources, leadership, training, and collegial encouragement. Behavioral Intention to Use Technology was identified as a key outcome shaped by these factors, indicating the future likelihood of sustained technology use. Finally, the Technical Environment addressed the reliability, accessibility, and adaptability of the digital infrastructure, further influencing teacher engagement with technology.

Keywords: Teacher Readiness, Faculty Perceptions, Technology Adoption, Digital Learning, Higher Education, Behavioural Intention

Introduction

In the digital age, technological integration in higher education is not only a catalyst for transforming teaching and learning but a strategic imperative for global educational competitiveness (UNESCO,

2023; OECD, 2022). The COVID-19 pandemic dramatically accelerated this shift, compelling universities worldwide to adopt remote, hybrid, and technology-enhanced modalities virtually overnight. As learning management systems, virtual classrooms, and AI-based tools become embedded in everyday pedagogy, the sustainability and impact of these transformations rest critically on one factor: faculty readiness and perceptions (Martin et al., 2020).

Globally, technology is recognized as a powerful means of bridging geographic, socioeconomic, and infrastructural gaps. Initiatives such as UNESCO's 2023 Global Education Monitoring Report, India's National Digital Library, and Ethiopia's Academic Digital Library exemplify scaled efforts to expand digital access. Yet, achieving the deeper pedagogical benefits of Education 4.0—personalized learning, data-driven instruction, and student-centered innovation—depends fundamentally on how ready and willing faculty are to adopt and meaningfully integrate digital technologies (OECD, 2022; UNESCO, 2023).

Despite massive investments in infrastructure and tools, faculty readiness and perceptions continue to vary widely. McKinsey (2022) reports that while both faculty and students express strong interest in continuing digital practices post-pandemic, many institutions still lack adequate support structures to enable meaningful integration of new technologies. OECD (2022) data show that nearly 20% of teachers, even after professional training, report feeling unprepared to teach effectively in an increasingly digital world—underscoring the persistent readiness gap. Furthermore, the rapid emergence of generative artificial intelligence (GenAI) adds new complexity: by early 2025, over 40% of young adults globally had used ChatGPT, prompting universities across continents to develop policies on AI integration (Ramos Salazar & Peeples, 2025; Viberg et al., 2023). Faculty self-efficacy, understanding, and perceptions of AI tools are now critical to shaping trust and pedagogical innovation with these technologies.

These global shifts underscore several urgent imperatives. First, universities must evolve institutional cultures and support systems to build faculty readiness for continuous technological innovation (McKinsey, 2022). Second, equity and inclusion depend heavily on faculty skills to leverage digital tools for personalized, accessible instruction (UNESCO, 2023; OECD, 2022). Third, the accelerating pace of technological change—particularly with AI—demands that faculty development becomes a continuous global priority (Viberg et al., 2023; Ramos Salazar & Peeples, 2025). Fourth, global smart education initiatives depend as much on faculty readiness and perceptions as on infrastructure investment.

However, research consistently highlights barriers to readiness: lack of self-efficacy, technical anxiety, limited pedagogical competence, and insufficient institutional support (Martin et al., 2020; Viberg et al., 2023). Faculty responses to these challenges vary—some embrace innovation, while others resist due to workload pressures or perceived misalignment with institutional priorities (Katsamakas et al., 2024; Martin et al., 2020). The factors shaping these varied perceptions and levels of readiness are complex and multidimensional.

Theoretical frameworks such as the Technology Acceptance Model (TAM) (Davis, 1989), Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh et al., 2003), and Technological Pedagogical Content Knowledge (TPACK) (Mishra & Koehler, 2006) offer valuable lenses for understanding these dynamics. Together, they highlight how cognitive beliefs (e.g., perceived usefulness, self-efficacy), pedagogical competence, affective factors (e.g., attitudes, anxiety), institutional conditions (e.g., support, leadership), and perceptions of the technical environment

influence faculty readiness and behavioral intention to adopt digital technologies (Granić & Marangunić, 2019; Meet et al., 2022; Khong et al., 2023).

Yet, the literature reveals key gaps. Faculty-centered studies remain comparatively scarce, particularly in non-Western and emerging contexts (Tamilmani et al., 2021; Al-Adwan et al., 2025). Much existing research focuses on student adoption, neglecting the nuanced factors that shape faculty perceptions and readiness. Moreover, evolving technological contexts—such as the rise of AI—require updated frameworks that capture new dimensions of faculty adoption (Viberg et al., 2023; Ramos Salazar & Peeples, 2025).

In response, this systematic literature review aims to synthesize global evidence on the factors influencing teacher readiness and perceptions toward digital learning technology in higher education. Covering research from 2010 to 2024 across diverse geographic regions, this review organizes findings into six key dimensions: cognitive readiness, pedagogical readiness, affective readiness, institutional readiness, technical environment, and behavioral intention. By doing so, it offers an integrative conceptual model that reflects the current global reality of higher education.

Ultimately, this paper addresses a globally significant challenge: Without faculty readiness and positive perceptions, even the most advanced technologies risk failing to achieve their pedagogical potential. By clarifying how personal beliefs, instructional competence, emotional dispositions, institutional support, infrastructure quality, and behavioral intention interact, this review provides insights to guide future research, policy, and practice—empowering faculty worldwide to lead sustainable and equitable digital transformation in higher education.

Methodology

This study employed a systematic literature review (SLR) to synthesize and critically examine existing research on teacher readiness and perceptions toward digital learning technology in higher education. The review process was conducted in accordance with the PRISMA 2020 guidelines (Page et al., 2021), ensuring transparency and rigor in the identification, screening, and selection of relevant studies. The central research question—"What are the key personal, pedagogical, institutional, and technological factors influencing higher education teachers' readiness and perceptions toward digital learning technology?"—guided the search strategy, inclusion criteria, and thematic synthesis.

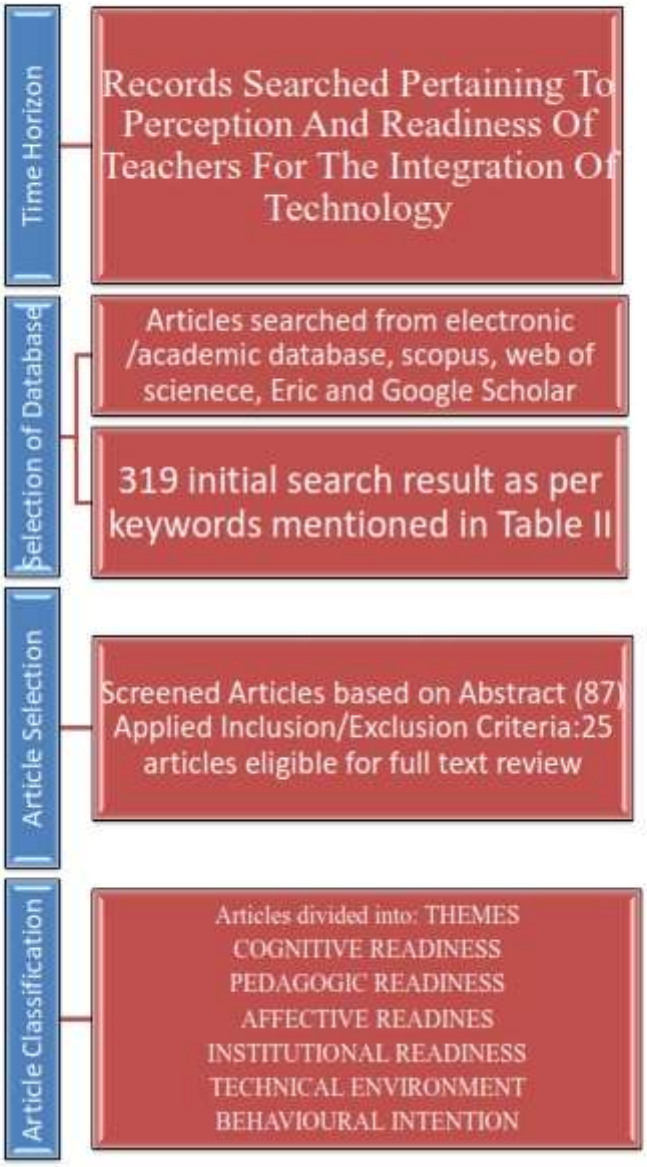
To analyze and synthesize the findings, this review drew on the established thematic analysis framework of Braun and Clarke (2006), which provided a systematic approach to identifying key patterns across the literature. Additionally, the review was informed by the four-step process for thematic synthesis outlined by Akomah-Twumasi et al. (2018), supporting the structured development of an integrative conceptual model of teacher readiness and perceptions. Specifically, the review approach combined four structured steps: time horizon, database selection, article selection, and article classification, as proposed by Akomah-Twumasi et al. (2018), to ensure a comprehensive and replicable review process. Figure 1 summarizes these four methodological steps applied in the present review.

Together, these methodological frameworks enabled a comprehensive, theory-driven, and transparent review process that integrates conceptual insights across diverse contexts of higher education.

Time Horizon for the Selection of Papers

Figure :1

Literature Search Process for a Systematic Review about Perception and Readiness of teachers towards Digital technology



The time horizon for the literature search spanned from 1989 to April 2025. This starting point was selected with clear theoretical justification: 1989 marks the publication of the foundational Technology Acceptance Model (TAM) by Davis (1989), a pivotal work that continues to shape technology adoption research across education and other domains. Including studies from this date onward allowed the review to capture the full trajectory of conceptual and empirical advancements related to teacher readiness, perceptions, and behavioural intention toward technology adoption.

The upper bound of April 2025 was set to ensure that the review reflects the most current developments in digital learning technology and its adoption in higher education. This is particularly important in light of the rapid evolution of educational technologies, including the integration of artificial intelligence (AI)

tools, advanced learning management systems (LMS), and interactive digital pedagogies, especially in the post-pandemic era (Ramos Salazar & Peeples, 2025; Viberg et al., 2023).

The chosen time horizon thus ensured both historical depth—by capturing key conceptual foundations—and contemporary relevance—by including the latest empirical insights into how higher education faculty perceive and adopt emerging digital learning technologies in their instructional practice.

Selection of Database

To ensure a comprehensive and high-quality retrieval of relevant studies, the literature search was conducted across four major academic databases: Scopus, Web of Science, ERIC, and Google Scholar. These databases were selected because they collectively provide broad coverage of interdisciplinary research spanning education, information systems, psychology, and technology adoption—fields that directly inform the study of teacher readiness and perceptions toward digital learning technology.

Scopus and Web of Science were included for their indexing of leading peer-reviewed journals and their strong coverage of educational technology and higher education research. ERIC (Education Resources Information Center), as a specialized database for educational research, ensured comprehensive inclusion of studies focused specifically on teacher education, faculty development, and pedagogical innovation. Google Scholar was included to capture emerging trends, conference papers, and grey literature not always indexed in traditional databases, thereby enhancing the inclusivity and breadth of the search (Boell & Cecez-Kecmanovic, 2015; Snyder, 2019).

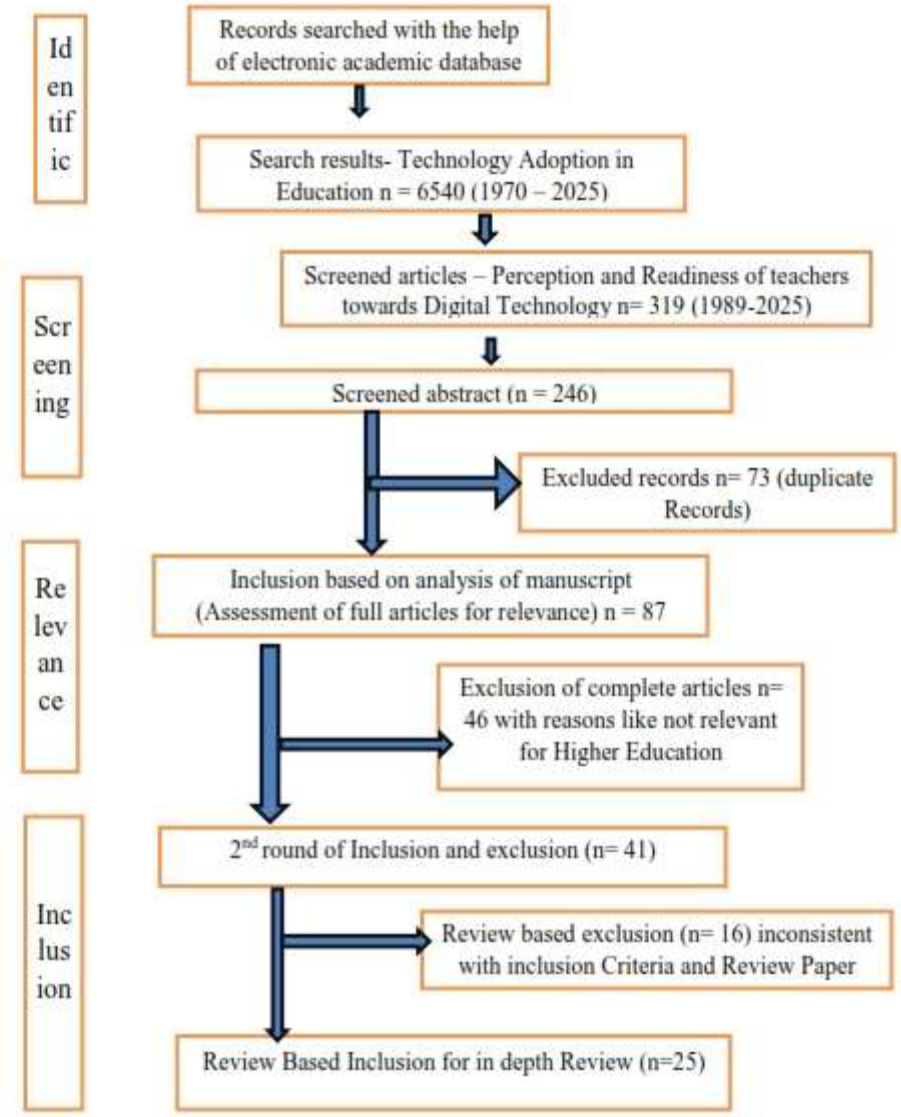
This multi-database strategy was employed to maximize coverage of relevant literature, avoid disciplinary bias, and ensure that both foundational studies and cutting-edge developments in the field of digital learning technology adoption were included in the review.

Searching and Selecting Articles

An initial systematic search was conducted across four major academic databases—Scopus, Web of Science, ERIC, and Google Scholar—to identify relevant peer-reviewed literature on teacher readiness and perceptions toward digital learning technology in higher education. The initial search retrieved a total of 319 records across all databases. After removing 73 duplicate records, 246 unique articles remained. The titles and abstracts of these articles were screened for topical relevance based on the central research question. Articles were excluded if they focused solely on students or K–12 teachers, lacked a theoretical framework, did not provide empirical data, or were not published in peer-reviewed journals. In addition, abstract-only publications, conference abstracts, opinion pieces, and grey literature were excluded from consideration. This initial screening yielded 87 articles eligible for full-text review. Each full-text article was then evaluated against the study's inclusion and exclusion criteria. To be included, studies had to focus on higher education faculty or teachers, examine constructs related to readiness, perceptions, behavioural intention, or technology adoption, employ or extend a recognized theoretical framework (TAM, UTAUT, TPACK, or equivalent), and be published in English between 1989 and April 2025. Ultimately, 25 full-text manuscripts were deemed suitable and included in the final synthesis. These 25 studies provide a robust, theory-grounded evidence base to inform the thematic analysis conducted in this review.

Figure: 2

Article Searching Process



Source: The Writing Style is obtained from AKOSH- Twumasi et al (2018)

The keyword search strategy was carefully developed to align with the study's conceptual framework and ensure comprehensive coverage of relevant literature. The search process combined specific keyword strings and Boolean operators designed to target articles examining technology adoption, teacher readiness, faculty perceptions, and behavioural intention toward digital learning technologies. Searches were conducted iteratively across the four selected databases. The string "technology adoption" AND "higher education" AND "faculty" returned 105 results, while "behavioural intention" AND "faculty" AND "technology use" yielded 75 results. The search string "TAM" OR "Technology Acceptance Model" AND "higher education" produced 48 results, and "UTAUT" OR "Unified Theory of Acceptance and Use of Technology" AND "faculty" resulted in 36 articles. The more targeted string "TPACK" AND "faculty" AND "higher education" retrieved 28 results, and "technology readiness" AND "higher education teachers" returned 27 results. The string "digital pedagogy" AND "faculty

adoption" produced 23 results, and "online teaching" AND "faculty perceptions" yielded 30 articles. Finally, the emerging topic of AI tools in higher education was captured through the search "AI tools in higher education" AND "faculty attitudes", which resulted in 18 articles. This cumulative keyword search strategy produced an initial pool of 319 articles, from which the final 25 studies were systematically selected after rigorous screening and full-text evaluation. The selection process ensured that the final set of articles provided a balanced representation of the theoretical models (TAM, UTAUT, TPACK), practical applications, and global contexts relevant to teacher readiness and perceptions toward digital learning technologies.

Table 1: Summary of Keyword Search Results

Search Keywords	Number of Results	Publication Years Covered
"technology adoption" AND "higher education" AND "faculty"	105	1989- April 2025
"behavioural intention" AND "faculty" AND "technology use"	75	1989- April 2025
"TAM" OR "Technology Acceptance Model" AND "higher education"	48	1989- April 2025
"UTAUT" OR "Unified Theory of Acceptance and Use of Technology" AND "faculty"	36	1989- April 2025
"TPACK" AND "faculty" AND "higher education"	28	1989- April 2025
"technology readiness" AND "higher education teachers"	27	2003- April 2025
"digital pedagogy" AND "faculty adoption"	23	1989- April 2025
"online teaching" AND "faculty perceptions"	30	1989- April 2025
"AI tools in higher education" AND "faculty attitudes"	18	2018–2024 (AI tools emerged later)
Total initial records across all search strings	**319**	**1989-2025**

Article Classification

Following the selection of eligible articles, a bibliographic list of all included studies was systematically prepared. An Excel spreadsheet was created to facilitate structured data management and coding. For each article, key bibliographic details—such as author(s), year of publication, journal name, country of study, research design, sample characteristics, theoretical framework used, and key findings—were extracted and recorded. This process enabled consistent tracking and comparison of the selected studies. The results were then analysed thematically, and each article was classified according to the major dimensions of the conceptual model guiding this review: Cognitive Readiness, Pedagogical Readiness, Affective Readiness, Institutional Readiness, Behavioural Intention, and Technical Environment. This classification process supported both thematic synthesis and the development of an integrative conceptual model, ensuring that the final analysis reflected the breadth and depth of theoretical and empirical contributions across the selected literature.

Findings

A comprehensive thematic analysis was conducted on the final set of 25 selected articles to identify key

factors influencing teacher readiness and perceptions toward digital learning technology in higher education. The analysis followed a three-stage coding approach—open coding, axial coding, and selective coding—to systematically derive conceptual insights from the literature. In the open coding phase, the full texts of all articles were read in detail, and initial codes were generated by highlighting segments of text that described relevant concepts, constructs, or findings related to technology adoption by faculty. This phase resulted in a large set of descriptive codes capturing diverse factors such as perceived usefulness, self-efficacy, institutional support, and attitudes toward technology.

During the subsequent axial coding phase, these initial codes were grouped and organized into broader categories based on relationships and conceptual similarities. This involved identifying connections between codes (e.g., linking "confidence in using LMS" with broader self-efficacy constructs) and structuring them under emerging dimensions aligned with the theoretical model. In this phase, redundant codes were merged, and conceptual clarity was established across the developing categories.

Finally, in the selective coding phase, the core themes and sub-themes were refined and validated against the full set of reviewed articles. The goal was to ensure that each identified theme represented a significant and recurring pattern across the literature and was theoretically sound. This phase also involved aligning the themes with the conceptual clusters guiding this study. The summary of reviewed articles and their key attributes is presented in Table 2, providing a transparent overview of the data sources informing the thematic analysis.

Based on this process, the following six major themes were identified: Cognitive Readiness, Pedagogical Readiness, Affective Readiness, Institutional Readiness, Behavioural Intention to Use Technology, and Technical Environment. These themes, supported by underlying sub-themes and codes, form the basis for the proposed integrative conceptual model and are discussed in detail in the sections that follow.

Table 2: Themes, Sub-themes, Detailed Underlying Codes, and Sample References

Theme	Sub-theme	Underlying Codes	Sample References
Cognitive Readiness	Perceived Usefulness (PU)	Perceived usefulness, usefulness beliefs, perceived benefit, performance expectancy, instructional value, teaching improvement, learning enhancement, productivity gain, outcome expectancy, instructional effectiveness, content delivery enhancement, perceived impact on student learning, teaching innovation, time-saving, increased engagement	Davis (1989); GraniÄ‡ & MaranguniÄ‡ (2019); Tamilmani et al. (2021)
	Perceived Ease of Use (PEU)	Perceived ease of use, ease beliefs, usability, effort expectancy, simplicity of use, intuitive interface, user-friendliness, learnability, task efficiency, minimal effort required, system flexibility, comfort with navigation, smooth learning curve, technical simplicity, ease of content creation, adaptability to teaching	Davis (1989); GraniÄ‡ & MaranguniÄ‡ (2019); Meet et al. (2022)
	Prior Experience with Technology	Prior exposure, past experience, technology familiarity, past training, frequency of use, experience with online teaching, familiarity with LMS, experience with educational software, professional development history, use of multimedia tools, exposure to online learning platforms, duration of technology use, number of training workshops attended, informal learning experiences, technology experimentation	Teo (2011); Mailizar et al. (2021); Ifinedo (2017)
	Self-Efficacy	Technology self-efficacy, confidence in technology use, perceived competence, belief in ability, digital confidence, perceived control, instructional self-efficacy, perceived ease of adapting to new tools, confidence in troubleshooting, resilience in overcoming tech challenges, self-perceived adaptability, beliefs about tech capabilities, coping with tech problems, self-judgment of competence, readiness to experiment	Holden & Rada (2011); Joo et al. (2018); Ibrahim & Shiring (2022)

Pedagogical Readiness	TPACK	Technological pedagogical content knowledge, technology integration with pedagogy, digital pedagogical skills, ability to blend content with technology, curriculum alignment with technology, adaptive use of digital tools, pedagogical creativity with tech, instructional design using technology, technology-supported active learning, scaffolding using technology, collaboration through digital means, student-centered tech use, digital storytelling, gamification competence, use of assessment technologies	Mishra & Koehler (2006); Sharma & Saini (2022); Khong et al. (2023); Zhou et al. (2022)
Affective Readiness	Attitude Toward Technology	Positive/negative attitude, perceived value of technology, acceptance, motivation, emotional disposition, interest in technology, openness to innovation, perceived relevance, intrinsic motivation, perceived alignment with teaching philosophy, curiosity, willingness to explore, attitude toward experimentation, perceived compatibility with values, personal satisfaction from using tech	Teo (2011); Fathema et al. (2015); Meet et al. (2022)
	Technology Anxiety	Technology-related anxiety, computer anxiety, digital stress, fear of failure, fear of making mistakes, performance anxiety, apprehension about troubleshooting, resistance to tech use, self-doubt, fear of being judged, perceived inadequacy, emotional discomfort, avoidance behaviour, fear of system breakdowns, negative past experiences with tech	SÃ¡nchez-Prieto et al. (2016); Mailizar et al. (2021); Holden & Rada (2011)
Institutional Readiness	Facilitating Conditions	Access to resources, technical support, infrastructure availability, administrative support, funding for digital tools, access to high-speed internet, availability of equipment, classroom tech integration, helpdesk services, availability of instructional designers, access to online learning platforms, scheduling support for training, troubleshooting assistance, system upgrades, continuous tech maintenance	Venkatesh et al. (2003); Tamilmani et al. (2021); Fathema et al. (2015); Al-Adwan et al. (2025)
	Institutional Support	Leadership encouragement, professional development, peer collaboration, organizational culture, recognition for innovation, incentives for tech use, availability of mentorship, community of practice, leadership vision alignment, support for experimentation, fostering tech champions, policy clarity, top-down encouragement, collaborative culture, institutional flexibility for innovation	Ifinedo (2017); Kopcha (2012); Ertmer & Ottenbreit-Leftwich (2010); Al-Adwan et al. (2025)
Technical Environment	Learning Environment Quality	System quality, platform reliability, accessibility, adaptability of technology environment, consistency of user experience, interoperability, seamless integration with LMS, uptime of systems, responsiveness, mobile compatibility, intuitive navigation, robustness under load, support for interactive features, multimedia compatibility, real-time collaboration support, data security and privacy	Fathema et al. (2015); Zhou et al. (2022); Sharma & Saini (2022)

Behavioral Intention	Intention to Use Technology	Behavioral intention, intention to adopt, willingness to use technology, continued use intention, future commitment, intention to integrate into teaching, desire to explore new tools, readiness to expand usage, personal motivation, perceived obligation, habitual use intentions, teaching goals alignment, future tech training interest, readiness to recommend to peers, openness to lifelong digital learning	Davis (1989); Venkatesh et al. (2003); Teo (2011); Al-Adwan et al. (2025)

Proposed Theoretical Model

Based on the thematic analysis conducted in this review, a proposed theoretical model has been developed to conceptualize teacher readiness and perceptions toward digital learning technology in higher education. The model is structured around six major themes—Cognitive Readiness, Pedagogical Readiness, Affective Readiness, Institutional Readiness, Behavioural Intention to Use Technology, and Technical Environment—each supported by corresponding sub-themes and constructs. This clustering is theoretically justified and reflects consistent patterns observed in prior literature.

Many previous studies in the field have demonstrated the importance of bifurcating or clustering factors influencing technology adoption into multi-dimensional constructs. For example, Granić and Marangunić (2019) systematically reviewed TAM-based studies and found that constructs beyond Perceived Usefulness and Perceived Ease of Use—such as self-efficacy, institutional support, and attitudes—repeatedly emerged as critical in explaining faculty adoption behaviours. Similarly, Tamilmani et al. (2021), in their review of UTAUT studies, highlighted how researchers frequently grouped factors into personal, institutional, and contextual influences to enhance explanatory power. Meet et al. (2022) demonstrated that integrating TAM and UTAUT constructs with emerging pedagogical and contextual variables provided a richer understanding of technology adoption in complex educational environments.

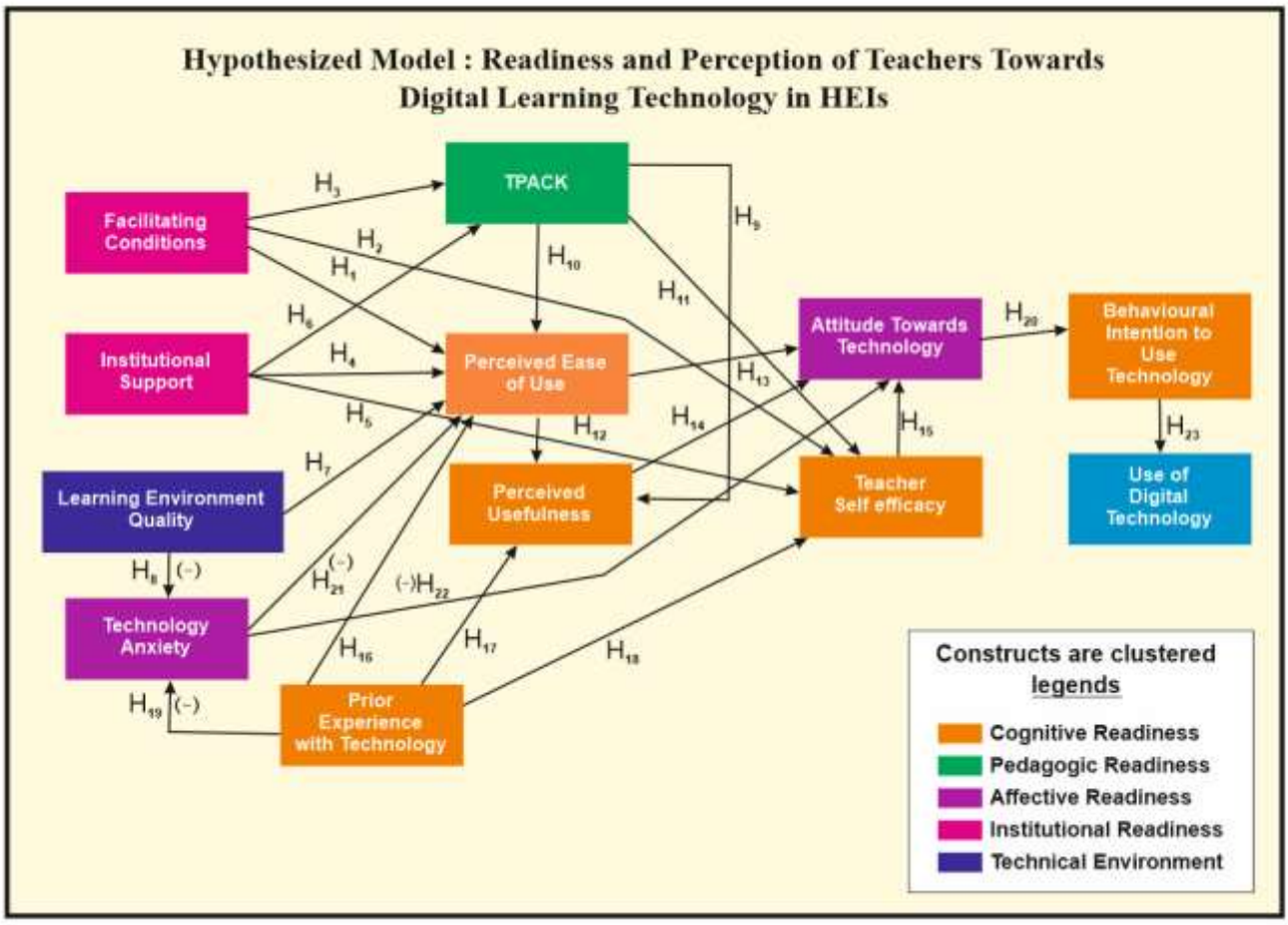
In contrast to earlier models that were predominantly cognitive-behavioural (Davis, 1989; Venkatesh et al., 2003), more recent studies have moved toward multi-dimensional frameworks that incorporate pedagogical, emotional, and institutional factors. For instance, Khong et al. (2023) extended TPACK-based models to include self-efficacy and institutional support, while Joo et al. (2018) emphasized the role of teacher self-efficacy and TPACK in shaping Behavioural Intention. Ertmer and Ottenbreit-Leftwich (2010) argued that beliefs, confidence, and contextual support are as crucial as technological competence in determining actual technology use.

This pattern across the literature supports the rationale for the current model's six-theme structure. Specifically, Cognitive Readiness subsumes foundational constructs such as Perceived Usefulness (PU), Perceived Ease of Use (PEU), Prior Experience, and Self-Efficacy, consistently validated in TAM/UTAUT-based studies (Davis, 1989; Granić & Marangunić, 2019). Pedagogical Readiness, represented through TPACK, aligns with increasing recognition that technology integration is inseparable from pedagogical and content knowledge (Mishra & Koehler, 2006; Sharma & Saini, 2022). Affective Readiness emerged as a distinct theme from numerous studies demonstrating that faculty attitudes, motivation, and technology anxiety directly influence adoption behaviours (Holden & Rada, 2011; Sánchez-Prieto et al., 2016).

Institutional Readiness was included due to strong empirical evidence that facilitating conditions, leadership support, peer collaboration, and infrastructure are pivotal enablers or barriers (Venkatesh et

al., 2003; Kopcha, 2012; Al-Adwan et al., 2025). Behavioural Intention to Use Technology is retained as a central outcome variable, consistent with TAM/UTAUT theory and supported by repeated findings across contexts (Davis, 1989; Teo, 2011; Al-Adwan et al., 2025). Finally, Technical Environment was added as a separate theme based on studies indicating that system quality, reliability, adaptability, and platform usability significantly shape both readiness and sustained use (Fathema et al., 2015; Zhou et al., 2022).

In sum, this model offers a holistic and empirically grounded framework that integrates cognitive, pedagogical, affective, institutional, behavioural, and technical dimensions—reflecting both foundational theoretical constructs and contemporary empirical insights. The deliberate selection of these six clusters enables the model to capture the multi-faceted nature of teacher readiness and perceptions toward digital learning technologies, providing a comprehensive lens for future research and practical application in higher education.



Theme :1 Cognitive Readiness

Cognitive Readiness emerged as a foundational theme in this review, encompassing the perceptual, experiential, and competence-based factors that shape how faculty members evaluate, engage with, and adopt digital learning technologies. This dimension draws heavily from the Technology Acceptance Model (TAM) (Davis, 1989) and UTAUT (Venkatesh et al., 2003), where perceptions of usefulness, ease of use, prior experience, and self-efficacy have been consistently identified as significant predictors of behavioural intention and technology readiness. In the context of higher education faculty, Cognitive Readiness reflects the extent to which teachers believe digital technologies will enhance teaching and

learning, feel confident in using them, and perceive them as aligned with their prior experience and instructional goals (Granić & Marangunić, 2019; Al-Adwan et al., 2025).

This theme was consistently emphasized across the literature, confirming its pivotal role in shaping faculty perceptions and readiness toward adopting digital learning tools. The four sub-themes—Perceived Usefulness (PU), Perceived Ease of Use (PEU), Prior Experience, and Self-Efficacy—represent the cognitive precursors that condition faculty members' decisions to engage with or resist technological integration.

Perceived Usefulness (PU)

Perceived Usefulness (PU) is defined as the degree to which a faculty member believes that using a particular digital learning technology will enhance their teaching effectiveness or improve student learning outcomes (Davis, 1989). In the higher education context, PU encompasses perceptions regarding the technology's potential to facilitate content delivery, student engagement, assessment practices, and pedagogical innovation (Fathema et al., 2015; Granić & Marangunić, 2019). PU serves as a key cognitive driver of both behavioural intention and overall readiness to adopt new technologies. Across the reviewed studies, PU consistently emerged as one of the strongest predictors of faculty perceptions and readiness toward digital technology adoption. For example, Fathema et al. (2015) found that PU significantly influenced behavioural intention to use Learning Management Systems (LMS), with faculty members perceiving these platforms as tools that enhance flexibility, efficiency, and teaching quality. Similarly, Meet et al. (2022) demonstrated that in the adoption of MOOCs during the pandemic, PU was more influential than PEU, suggesting that perceived pedagogical value outweighed technical concerns in shaping adoption.

Granić and Marangunić (2019), through their systematic review of TAM-based studies in education, confirmed that PU remains a central determinant across diverse technologies and educational contexts. Their review also highlighted that faculty perceptions of usefulness are strongly mediated by institutional incentives and alignment with pedagogical goals, indicating that PU is not purely a technological evaluation but deeply intertwined with teaching values.

Joo et al. (2018) further validated the importance of PU in their study on pre-service teachers, where PU was found to be a direct and significant predictor of intention to adopt technology, surpassing other factors such as PEU or institutional support in explanatory power. Similarly, Sharma and Saini (2022) found that Indian faculty members with higher TPACK levels perceived digital technologies as more useful, reinforcing the link between pedagogical competence and PU perceptions.

In contrast, Teo (2011) observed that while PU was an important predictor of behavioural intention, its effect was sometimes mediated by faculty attitudes—indicating that emotional readiness (Affective Readiness) can modulate the cognitive evaluation of usefulness. Moreover, Holden and Rada (2011) found that self-efficacy and perceived usability can sometimes outweigh PU when faculty face technological anxiety or when institutional support is lacking, suggesting that PU alone is insufficient to ensure readiness in the absence of enabling conditions.

Most studies converged on the finding that PU strongly supports readiness and positive perceptions of digital learning technologies. The consistent empirical validation of PU across contexts (Fathema et al., 2015; Granić & Marangunić, 2019; Joo et al., 2018) highlights its robust and generalizable role in shaping adoption behaviour. However, some studies (Teo, 2011; Holden & Rada, 2011) caution that PU operates in interaction with other factors—notably self-efficacy, institutional readiness, and affective factors—and is not always sufficient to ensure behavioural intention when these dimensions are weak.

Based on this review, Perceived Usefulness emerges as a critical cognitive construct that directly affects both perceptions and readiness among higher education faculty. Faculty members who perceive digital tools as enhancing instructional effectiveness are significantly more likely to develop positive attitudes toward adoption and exhibit higher readiness for continuous use. Conversely, when PU is low—either due to lack of pedagogical alignment or institutional barriers—faculty readiness diminishes, even when technical support or training is available. The inclusion of PU as a sub-theme in the proposed model is therefore essential for capturing the cognitive mechanisms that drive or inhibit technology adoption, and it aligns strongly with both TAM (Davis, 1989) and integrated models (Meet et al., 2022; Al-Adwan et al., 2025).

Perceived Ease of Use (PEU)

Perceived Ease of Use (PEU), another core cognitive construct grounded in the Technology Acceptance Model (TAM), refers to the extent to which faculty members believe that using a digital learning technology will be free of effort and manageable within their teaching workflows (Davis, 1989). While PU captures the perceived value of the technology, PEU addresses operational and experiential barriers that often influence whether faculty choose to engage with a tool at all. Across the reviewed literature, PEU was found to exert both direct and indirect effects on teacher readiness and perceptions. Faculty who perceive digital tools as difficult, unintuitive, or disruptive to established teaching practices are far less likely to adopt them—even if they acknowledge their potential usefulness (Holden & Rada, 2011; Granić & Marangunić, 2019).

Multiple studies corroborated the importance of PEU in shaping readiness. Fathema et al. (2015), in their study of LMS adoption, demonstrated that PEU significantly influenced both Perceived Usefulness and Behavioural Intention, suggesting a mediating effect whereby tools that are easier to use are more likely to be perceived as useful. Similarly, Meet et al. (2022) found that PEU was a strong determinant of faculty intention to adopt MOOCs, particularly among those with limited prior experience. Joo et al. (2018) confirmed that PEU had both a direct and indirect effect on intention to use technology, mediated through PU and self-efficacy, especially for pre-service teachers who often faced initial apprehension.

Notably, studies also pointed to disciplinary and contextual variations in how PEU shapes perceptions. Sharma and Saini (2022) reported that in Indian higher education, faculty members in non-STEM disciplines often perceive PEU as a greater barrier, reflecting gaps in digital literacy training and limited exposure to user-friendly platforms. Conversely, Khong et al. (2023) found that post-pandemic exposure to online teaching platforms had significantly improved faculty PEU perceptions in Malaysia, underscoring the dynamic nature of this construct over time and with practice.

There were some points of contrast in the literature regarding the relative weight of PEU versus PU. While PU was consistently identified as a stronger predictor of intention (Granić & Marangunić, 2019; Meet et al., 2022), several studies (Holden & Rada, 2011; Joo et al., 2018) highlighted that PEU plays a critical enabling role, especially in early adoption stages. When tools are perceived as difficult to use, even highly motivated faculty with positive attitudes may defer or abandon adoption efforts (Holden & Rada, 2011). Furthermore, studies by Teo (2011) and Fathema et al. (2015) emphasized that the relationship between PEU and PU is particularly strong for novice users or in contexts where institutional support is limited—suggesting that PEU perceptions can either accelerate or block the development of positive perceptions about usefulness.

Overall, the evidence strongly supports the inclusion of PEU as a distinct sub-theme under Cognitive Readiness in the proposed model. PEU affects readiness and perceptions both directly—by shaping

confidence and reducing anxiety—and indirectly—by enhancing perceived usefulness and fostering behavioural intention. Its impact is particularly pronounced for faculty with lower digital fluency, in disciplines where pedagogical use of technology is less common, and in institutions with variable levels of training and support. Therefore, designing digital tools and professional development programs that explicitly address PEU is crucial to promoting broader and more sustained faculty engagement with digital learning technologies.

Prior Experience with Technology

Prior Experience with Technology constitutes another key dimension of Cognitive Readiness, shaping both faculty perceptions and readiness to engage with new digital learning tools. It refers to the extent and nature of faculty members' previous interactions with technology, both in professional and personal contexts, including prior exposure to educational technologies, general digital literacy, and comfort with integrating technology into teaching (Granić & Marangunić, 2019; Ertmer & Ottenbreit-Leftwich, 2010). Prior experience serves as a cognitive filter that influences how new technologies are perceived: faculty with richer, more positive experiences tend to approach new tools with greater confidence, openness, and a stronger belief in their potential usefulness (Joo et al., 2018; Meet et al., 2022). Conversely, negative or limited prior experience often translates into technological anxiety, lower self-efficacy, and resistance to adoption (Holden & Rada, 2011; Sharma & Saini, 2022).

The reviewed literature consistently highlights the cumulative role of prior experience in shaping both readiness and perceptions. For example, Ertmer and Ottenbreit-Leftwich (2010) emphasized that second-order barriers—such as pedagogical beliefs and confidence—are often rooted in teachers' prior encounters with technology. Faculty with limited or frustrating past experiences are more likely to question the pedagogical relevance of digital tools, even when institutional support is provided. Similarly, Sharma and Saini (2022) found that faculty members with greater prior experience in using LMSs and digital assessment tools reported significantly higher Cognitive and Pedagogical Readiness, suggesting that experience helps build both competence and alignment with teaching goals.

Joo et al. (2018) reported that prior experience not only influences self-efficacy but also moderates the relationships between PEU, PU, and behavioural intention—indicating that faculty with rich prior experience are more likely to perceive new technologies as both useful and easy to use. Meet et al. (2022) similarly observed that participants with more extensive exposure to MOOCs during the pandemic exhibited higher readiness, greater perceived usefulness, and stronger behavioural intentions to continue using such platforms post-pandemic. In contrast, Teo (2011) found that novice users—those with minimal prior experience—relied more heavily on institutional support and peer models to build readiness, suggesting that prior experience acts as a key enabler of autonomous adoption.

While the majority of studies supported the positive influence of prior experience, a few introduced nuance. Holden and Rada (2011) found that prior negative experiences with poorly designed platforms sometimes led to persistent technology resistance, even when newer, more user-friendly tools were introduced. Similarly, Sharma and Saini (2022) noted that prior experience must be pedagogically meaningful—exposure to technology that is not integrated with content or pedagogical goals may fail to build readiness and can even reinforce scepticism.

In sum, Prior Experience with Technology exerts both direct and moderating effects on teacher perceptions and readiness toward digital learning technology. It enhances self-efficacy, increases perceived ease of use, and strengthens behavioural intention when experiences are positive and pedagogically relevant. Conversely, limited or negative prior experience represents a significant barrier

to adoption. Including this sub-theme in the proposed model is therefore justified both theoretically and empirically: it captures the longitudinal and cumulative nature of faculty readiness development and highlights an actionable area for institutional intervention through targeted professional development and scaffolding.

Self-Efficacy

Self-Efficacy, the final sub-theme under Cognitive Readiness, refers to faculty members' belief in their own capability to effectively use digital learning technologies to achieve instructional goals (Bandura, 1997; Holden & Rada, 2011). In the technology adoption context, self-efficacy shapes not only whether faculty members will attempt to integrate new tools, but also how they respond to challenges, persist in learning, and adapt technology use to evolving pedagogical needs (Joo et al., 2018; Al-Adwan et al., 2025). Importantly, self-efficacy influences perceptions of ease of use, usefulness, and behavioural intention, acting as a central mediator between cognitive appraisals and actual adoption behaviours (Holden & Rada, 2011; Ertmer & Ottenbreit-Leftwich, 2010).

Across the reviewed literature, self-efficacy consistently emerged as one of the strongest predictors of faculty readiness and perceptions toward digital learning technology. Al-Adwan et al. (2025) found that self-efficacy was a critical enabler of continuous use intention among higher education faculty, with stronger self-efficacy leading to greater behavioural commitment even when institutional support was uneven. Similarly, Joo et al. (2018) demonstrated that self-efficacy directly predicted both perceived usefulness and perceived ease of use, and had a significant positive effect on behavioural intention to use technology among pre-service teachers.

Holden and Rada (2011) highlighted that technology self-efficacy often exerts an even stronger effect than PEU on behavioural intention: faculty members with high self-efficacy were more likely to overcome initial usability challenges and engage in active problem-solving to integrate technology effectively. This finding underscores that confidence, rather than purely ease of use, often determines whether faculty persist in adopting new tools.

Ertmer and Ottenbreit-Leftwich (2010) provided further depth by showing that self-efficacy is shaped not only by prior experience but also by social modelling, peer support, and institutional encouragement—suggesting that self-efficacy is a dynamic construct that can be developed through targeted interventions. Sharma and Saini (2022) reinforced this view, reporting that faculty with higher self-efficacy scores exhibited significantly greater readiness to experiment with advanced pedagogical uses of technology, beyond basic adoption. Conversely, faculty with low self-efficacy tended to restrict their use to minimal or administrative functions, even when platforms were available and training was offered.

Some studies introduced nuance regarding the relationship between self-efficacy and institutional readiness. For example, Khong et al. (2023) found that institutional support can partially compensate for low self-efficacy during initial stages of technology adoption, but sustained integration and pedagogical innovation ultimately depend on building faculty confidence. Similarly, Teo (2011) observed that self-efficacy moderated the impact of facilitating conditions on behavioural intention: faculty with high self-efficacy derived greater benefit from institutional support structures, while those with low self-efficacy remained hesitant despite external enablers.

Thus, the inclusion of Self-Efficacy as a distinct sub-theme in the proposed model is both theoretically and empirically warranted. It acts as a central cognitive and motivational mechanism that underpins faculty readiness and shapes perceptions of technology's value and manageability. Moreover, self-

efficacy serves as a key leverage point for institutional interventions aimed at fostering sustainable, transformative uses of digital learning technologies. Without addressing self-efficacy, even well-designed platforms and supportive environments may fail to translate into widespread faculty adoption and pedagogical innovation.

In summary, the theme of Cognitive Readiness encompasses a set of interrelated cognitive and experiential factors that collectively shape faculty members' perceptions and readiness to adopt digital learning technologies. The four sub-themes—Perceived Usefulness (PU), Perceived Ease of Use (PEU), Prior Experience with Technology, and Self-Efficacy—emerged consistently across the reviewed literature as critical enablers or barriers to adoption. PU reflects faculty members' beliefs about the pedagogical value of digital tools, while PEU captures their perceptions of operational manageability. Prior Experience provides the contextual lens through which new technologies are appraised, influencing both confidence and expectations. Self-Efficacy acts as a central motivational mechanism, determining whether faculty feel capable of integrating technology into their teaching practice and whether they persist in doing so. Together, these cognitive dimensions create the foundation for faculty attitudes toward digital innovation and form a key determinant of their behavioural intention to adopt and sustain the use of digital technologies in higher education settings. The strong empirical support for each of these sub-themes underscores the necessity of addressing both the cognitive beliefs and prior experiences of faculty when designing interventions to foster digital readiness and sustained engagement.

Theme 2 Pedagogic Readiness

While Cognitive Readiness provides the foundational beliefs, perceptions, and confidence that shape faculty members' willingness to engage with digital learning technologies, it is insufficient on its own to ensure meaningful or transformative integration of these tools into teaching practice. The literature clearly indicates that successful and sustained technology adoption in higher education also depends on faculty members' ability to blend technology with pedagogy and subject content in instructionally effective ways (Mishra & Koehler, 2006; Khong et al., 2023). This brings into focus the second major theme identified in this review—Pedagogical Readiness—which addresses the extent to which educators possess the knowledge, skills, and dispositions required to design and deliver technology-enhanced learning experiences. The following section provides an in-depth analysis of this theme and its core sub-theme, Technological Pedagogical Content Knowledge (TPACK), drawing on insights from the literature to further elucidate how pedagogical factors influence teacher perceptions and readiness toward digital learning technology.

Pedagogical Readiness, the second major theme identified in this review, refers to the extent to which faculty members are prepared to meaningfully integrate digital technologies with pedagogical strategies and subject content in their teaching. While Cognitive Readiness ensures that faculty members feel confident and motivated to adopt technology, Pedagogical Readiness addresses whether they possess the requisite instructional knowledge and skills to do so effectively (Mishra & Koehler, 2006; Khong et al., 2023). This dimension is critical because faculty adoption of technology often fails to achieve transformative pedagogical impact when it focuses merely on the technical use of tools, without embedding them in appropriate instructional design (Ertmer & Ottenbreit-Leftwich, 2010). The central sub-theme of Pedagogical Readiness, as identified in this review, is Technological Pedagogical Content

Knowledge (TPACK), which provides a robust conceptual framework for understanding how faculty combine technology, pedagogy, and content knowledge to create effective digital learning environments.

Technological Pedagogical Content Knowledge (TPACK)

Technological Pedagogical Content Knowledge (TPACK), first conceptualized by Mishra and Koehler (2006), captures the complex interplay between faculty members' knowledge of technology, pedagogy, and subject content. Faculty with high TPACK are able to select appropriate digital tools, design technology-enhanced learning activities, and align technology use with disciplinary teaching objectives. Across the reviewed studies, TPACK was consistently identified as a key determinant of both faculty readiness and positive perceptions toward digital learning technologies. For instance, Sharma and Saini (2022) found that faculty members with higher self-reported TPACK were significantly more likely to adopt student-centred pedagogical approaches using digital tools, moving beyond surface-level adoption toward deeper instructional innovation. Similarly, Joo et al. (2018) reported that TPACK had a strong positive influence on both Perceived Usefulness and Behavioural Intention, suggesting that pedagogical competence reinforces positive cognitive appraisals of technology.

Khong et al. (2023) provided further evidence, demonstrating that TPACK not only influenced faculty intention to continue online teaching post-pandemic, but also moderated the effects of self-efficacy and institutional support. Faculty with stronger TPACK were more likely to sustain technology integration, even in contexts where institutional incentives were limited. Moreover, Zhou et al. (2022) emphasized that TPACK development is an ongoing process: faculty members who engaged in self-directed learning and reflective teaching practices exhibited higher TPACK growth and greater readiness to adopt emerging technologies such as AI-based tools.

Interestingly, some studies highlighted disciplinary variations in TPACK development. Sharma and Saini (2022) observed that non-STEM faculty often reported lower TPACK levels and faced greater challenges in aligning technology with content-specific pedagogy, underscoring the need for discipline-sensitive professional development. In contrast, Thohir et al. (2023) found that even pre-service teachers in VR-based learning contexts demonstrated strong adoption intentions when supported by TPACK-oriented training, suggesting that targeted interventions can build pedagogical readiness across disciplines.

While the majority of studies converged on the importance of TPACK, some nuances emerged regarding its interaction with other readiness dimensions. For example, Joo et al. (2018) noted that high TPACK alone does not guarantee behavioural intention if self-efficacy and institutional readiness are weak, indicating that pedagogical competence must be supported by confidence and enabling conditions. Similarly, Ertmer and Ottenbreit-Leftwich (2010) argued that TPACK development must be accompanied by belief change and cultural support within institutions to drive sustained technology adoption.

In conclusion, TPACK represents the core sub-theme of Pedagogical Readiness and is essential for ensuring that faculty perceptions and readiness toward digital learning technologies translate into meaningful pedagogical innovation. Faculty members with high TPACK are better positioned to select, adapt, and evaluate digital tools in ways that enhance student learning, thus reinforcing both Cognitive and Behavioural Readiness. Its inclusion in the proposed model is strongly supported by the literature, highlighting the need for integrated professional development strategies that foster both technical competence and pedagogical vision among higher education faculty.

Theme: 3 Affective Readiness

Affective Readiness, the third major theme identified in this review, refers to the emotional dispositions, attitudes, and psychological responses that shape faculty members' engagement with digital learning technologies. While Cognitive and Pedagogical Readiness address beliefs and skills, Affective Readiness captures the emotional drivers and barriers that influence whether faculty members approach technology adoption with enthusiasm, curiosity, resistance, or anxiety (Teo, 2011; Ertmer & Ottenbreit-Leftwich, 2010). The literature consistently highlights that even when faculty possess the technical competence and pedagogical knowledge to adopt digital tools, negative attitudes or emotional discomfort can inhibit readiness and lead to partial or failed adoption (Holden & Rada, 2011). Conversely, positive attitudes and affective openness are linked to greater behavioural intention and sustained use (Joo et al., 2018; Al-Adwan et al., 2025). This review identified two core sub-themes within Affective Readiness: Attitude Toward Technology and Technology Anxiety.

Attitude Toward Technology

Attitude Toward Technology is defined as the overall evaluative disposition—positive or negative—that faculty members hold toward the use of digital learning technologies in their teaching practice (Davis, 1989; Teo, 2011). Attitudes reflect cognitive beliefs, past experiences, and affective responses, and play a critical role in mediating the relationship between cognitive readiness and behavioural intention (Teo, 2011; Joo et al., 2018). Across the reviewed studies, Attitude Toward Technology was consistently found to exert a strong direct influence on faculty perceptions and readiness. For example, Teo (2011) demonstrated that Attitude significantly mediated the effects of both Perceived Usefulness and Perceived Ease of Use on behavioural intention among pre-service teachers, highlighting that positive cognitive beliefs must be accompanied by favourable affective evaluations to translate into actual adoption. Similarly, Joo et al. (2018) found that Attitude was a strong predictor of intention to use technology, even when controlling for self-efficacy and institutional support, suggesting that fostering positive attitudes is key to promoting readiness.

Holden and Rada (2011) further emphasized that faculty attitudes are shaped by perceived usability and self-efficacy: faculty who feel confident and find tools easy to use tend to develop more positive attitudes. Conversely, negative prior experiences and low self-efficacy often lead to persistent attitudinal resistance, even when institutional pressures for adoption are present. Ertmer and Ottenbreit-Leftwich (2010) similarly noted that Attitude is closely linked to second-order barriers, including beliefs about teaching and learning; faculty who view technology as incompatible with their pedagogical values tend to develop negative attitudes regardless of tool functionality.

Several studies also highlighted the role of institutional culture and peer influence in shaping Attitude. Al-Adwan et al. (2025) reported that faculty attitudes toward continuous technology use were positively influenced by leadership encouragement and peer modelling, reinforcing the idea that Affective Readiness is socially constructed as well as individually experienced. In contrast, Sharma and Saini (2022) found that in contexts where institutional support was weak or inconsistent, even technically skilled faculty often developed cautious or ambivalent attitudes, limiting their readiness to adopt more advanced pedagogical uses of technology.

In conclusion, Attitude Toward Technology exerts a central affective influence on faculty readiness and perceptions. It mediates the translation of cognitive beliefs and pedagogical competence into behavioural intention and sustained use. The strong empirical support for Attitude across diverse contexts and models (TAM, UTAUT, TPACK-integrated frameworks) justifies its inclusion as a key sub-theme of

Affective Readiness in the proposed model. Addressing faculty attitudes through targeted professional development, positive modelling, and institutional culture-building is therefore critical to fostering a climate of openness and engagement with digital learning technologies.

Technology Anxiety

Technology Anxiety, the second sub-theme within Affective Readiness, refers to the feelings of apprehension, fear, or discomfort that faculty members experience when engaging with digital learning technologies (Venkatesh et al., 2003; Holden & Rada, 2011). It reflects an affective barrier that can strongly inhibit both perceptions of usefulness and ease of use and diminish overall readiness to adopt or sustain the use of technology (Joo et al., 2018; Sánchez-Prieto et al., 2016). Technology Anxiety encompasses concerns about technical failure, loss of control in the classroom, embarrassment in front of students, and increased workload due to technology integration (Sharma & Saini, 2022; Ertmer & Ottenbreit-Leftwich, 2010). Importantly, it operates independently of actual technical competence—faculty members with sufficient cognitive and pedagogical readiness may still exhibit high levels of anxiety that limit their behavioural intention (Sánchez-Prieto et al., 2016).

Across the reviewed literature, Technology Anxiety was consistently identified as a negative predictor of faculty readiness and perceptions. Sánchez-Prieto et al. (2016) demonstrated that in the context of mLearning, Technology Anxiety exerted a significant negative effect on Perceived Ease of Use, which in turn reduced both Perceived Usefulness and Behavioural Intention among pre-service teachers. Similarly, Joo et al. (2018) found that higher Technology Anxiety scores correlated with lower self-efficacy and diminished readiness to integrate technology into teaching practice. Holden and Rada (2011) also confirmed that Technology Anxiety moderates the effects of perceived usability: even faculty who rated tools as highly usable sometimes avoided adoption due to persistent emotional discomfort.

Interestingly, several studies highlighted that Technology Anxiety is not static—it can be mitigated through targeted interventions, positive modelling, and professional development (Ertmer & Ottenbreit-Leftwich, 2010). For example, Sharma and Saini (2022) reported that Indian faculty members with higher exposure to peer mentoring and situated professional development reported lower levels of anxiety and greater readiness to explore advanced pedagogical uses of technology. Similarly, Khong et al. (2023) observed that post-pandemic increases in faculty experience with online teaching contributed to a significant reduction in Technology Anxiety and a corresponding increase in behavioural intention.

Contrasts also emerged regarding the disciplinary distribution of anxiety. Sharma and Saini (2022) found that non-STEM faculty reported significantly higher Technology Anxiety, often due to lower prior exposure and limited access to discipline-specific digital tools. Conversely, Thohir et al. (2023) found that pre-service teachers trained in highly interactive, scaffolded environments (such as VR integration programs) developed lower anxiety and higher confidence, suggesting that the design of training environments plays a critical role in moderating this affective barrier.

In sum, Technology Anxiety constitutes a significant negative affective influence on faculty readiness and perceptions toward digital learning technology. It affects not only initial adoption but also long-term engagement and pedagogical innovation. Its inclusion as a sub-theme of Affective Readiness in the proposed model is essential, as addressing faculty anxiety—through supportive training, positive experiences, and peer modelling—is a prerequisite for building sustained, positive perceptions and readiness to engage with digital learning technologies.

In summary, the theme of Affective Readiness encompasses the crucial emotional and psychological factors that influence faculty members' perceptions and readiness to adopt digital learning technologies. The two sub-themes—Attitude Toward Technology and Technology Anxiety—represent opposing affective forces that can either facilitate or hinder technology adoption. Positive attitudes foster openness, curiosity, and sustained behavioural intention, while high levels of anxiety act as significant barriers, even among technically competent faculty. The literature clearly demonstrates that affective factors often mediate or moderate the effects of cognitive and pedagogical readiness, meaning that even well-designed tools and strong institutional support may fail to achieve widespread adoption if emotional barriers are not addressed. The strong empirical support for both sub-themes across diverse contexts underscores the importance of incorporating Affective Readiness into the proposed model, and highlights the need for institutions to proactively foster positive attitudes and mitigate technology-related anxieties through supportive, inclusive, and confidence-building interventions.

Theme 4 Institutional Readiness

Institutional Readiness, the fourth major theme identified in this review, refers to the extent to which the organisational environment supports and enables faculty members' adoption of digital learning technologies. Unlike Cognitive, Pedagogical, or Affective Readiness—which are rooted in individual characteristics—Institutional Readiness encompasses the external structures, resources, leadership, and social environment that influence faculty perceptions and readiness (Venkatesh et al., 2003; Al-Adwan et al., 2025). The literature consistently highlights that without a supportive institutional context, even highly motivated and competent faculty members may face insurmountable barriers to technology integration (Fathema et al., 2015; Teo, 2011). Conversely, strong institutional readiness fosters positive perceptions, increases behavioural intention, and promotes sustained technology use (Khong et al., 2023). This review identified two core sub-themes within Institutional Readiness: Facilitating Conditions and Institutional Support.

Facilitating Conditions

Facilitating Conditions refer to the availability of technical infrastructure, training, resources, and organisational processes that enable faculty to use digital technologies effectively (Venkatesh et al., 2003). These conditions shape both the perceived ease of use and the behavioural intention to adopt technology (Fathema et al., 2015; Meet et al., 2022). Across the reviewed literature, Facilitating Conditions consistently emerged as a strong enabler of readiness and perceptions. For example, Fathema et al. (2015) demonstrated that in the context of LMS adoption, Facilitating Conditions had a significant positive effect on both Perceived Ease of Use and Behavioural Intention, suggesting that technical support, training, and access to reliable systems are critical drivers of adoption. Similarly, Meet et al. (2022) reported that Facilitating Conditions were among the strongest predictors of intention to use MOOCs in higher education, particularly in contexts where faculty were adopting these platforms rapidly in response to COVID-19 disruptions.

Al-Adwan et al. (2025) further reinforced the importance of Facilitating Conditions in sustaining technology use over time: their integrated model showed that strong Facilitating Conditions not only supported initial adoption but also fostered Continuous Use Intention, highlighting that institutional readiness must extend beyond one-time interventions. Khong et al. (2023) provided additional nuance, showing that Facilitating Conditions also moderate the effects of self-efficacy and affective readiness—

faculty with access to strong institutional supports reported lower Technology Anxiety and higher confidence, even when their prior experience was limited.

Some studies also highlighted disparities in Facilitating Conditions across contexts and disciplines. Sharma and Saini (2022) found that non-STEM faculty often reported lower access to discipline-specific tools and training, which negatively affected their readiness. In contrast, Teo (2011) observed that in well-resourced institutions, even faculty with moderate self-efficacy were able to develop readiness and positive perceptions when robust Facilitating Conditions were in place. This suggests that institutional investments in infrastructure and support can compensate for individual-level barriers and promote more equitable patterns of adoption across the faculty population.

Thus, Facilitating Conditions represent a critical institutional lever for shaping faculty readiness and perceptions. Their impact extends beyond technical enablement: strong facilitating environments foster positive attitudes, build confidence, and support the development of pedagogical and affective readiness. The consistent and strong empirical support for this sub-theme justifies its inclusion in the proposed model, and highlights the need for higher education institutions to invest in holistic, sustained, and discipline-sensitive support structures that enable all faculty members to engage meaningfully with digital learning technologies.

Institutional Support

Institutional Support, the second sub-theme within Institutional Readiness, refers to the broader organisational climate, leadership commitment, peer culture, and professional development opportunities that shape faculty members' perceptions and readiness to adopt digital learning technologies (Al-Adwan et al., 2025; Ertmer & Ottenbreit-Leftwich, 2010). Whereas Facilitating Conditions focus on technical infrastructure and resources, Institutional Support captures the social and organisational processes that build trust, motivation, and collective efficacy around technology use (Fathema et al., 2015; Al-Adwan et al., 2025). The literature consistently shows that when institutional leaders actively promote technology integration, provide vision and encouragement, and foster collaborative communities, faculty members are more likely to develop positive attitudes, higher self-efficacy, and stronger behavioural intention to engage with digital tools (Khong et al., 2023; Sharma & Saini, 2022).

Across the reviewed studies, Institutional Support was identified as a critical contextual enabler of both readiness and perceptions. Al-Adwan et al. (2025) found that management support exerted a significant direct effect on continuous use intention among higher education faculty, and indirectly influenced self-efficacy and perceived usefulness. Similarly, Fathema et al. (2015) reported that organisational support structures, such as clear policies, ongoing professional development, and leadership communication, enhanced faculty members' confidence in using LMS platforms and fostered more sustained adoption. Ertmer and Ottenbreit-Leftwich (2010) further argued that without visible and consistent leadership support, even well-designed technologies and technical infrastructure may fail to achieve deep integration into pedagogical practice.

Khong et al. (2023) provided additional insight by showing that peer culture and social norms are also key elements of Institutional Support. Faculty members who observed positive modelling by colleagues and received encouragement from department heads were more likely to experiment with new digital pedagogies and sustain their use post-pandemic. In contrast, Sharma and Saini (2022) found that in institutions where leadership support was weak or fragmented, faculty readiness was often highly individualised and uneven, with adoption driven mainly by self-motivated early adopters rather than systemic institutional momentum.

Importantly, several studies highlighted that Institutional Support also moderates the effects of Technology Anxiety and Affective Readiness. For example, Khong et al. (2023) reported that strong Institutional Support reduced anxiety and built positive attitudes, particularly among less experienced faculty. Ertmer and Ottenbreit-Leftwich (2010) similarly argued that leadership vision and peer collaboration foster a sense of collective efficacy, making faculty feel less isolated and more supported in their technology integration efforts.

In conclusion, Institutional Support is a pivotal social and organisational enabler of faculty readiness and perceptions toward digital learning technology. It shapes not only individual motivation and confidence but also the cultural climate within which technology adoption occurs. The strong and consistent empirical support for this sub-theme across diverse contexts justifies its inclusion in the proposed model, and underscores the need for higher education institutions to adopt holistic leadership strategies, build collaborative peer cultures, and invest in sustained professional development to drive meaningful and equitable digital transformation.

In summary, Institutional Readiness encompasses the vital organisational enablers that shape faculty perceptions and readiness to adopt digital learning technologies. The two sub-themes—Facilitating Conditions and Institutional Support—operate in complementary ways to foster an environment where faculty members can engage meaningfully and confidently with digital tools. While Facilitating Conditions provide the necessary technical infrastructure, training, and operational resources, Institutional Support creates the broader leadership vision, peer culture, and professional development ecosystem that drives motivation and sustains behavioural intention. The literature clearly demonstrates that Institutional Readiness significantly influences not only initial adoption but also long-term engagement and pedagogical innovation. Without institutional structures that reinforce both individual and collective readiness, even the most user-friendly technologies risk being underutilised. The inclusion of this theme in the proposed model is therefore essential, highlighting that institutional investment in both infrastructure and leadership-driven cultural change is key to achieving sustainable digital transformation in higher education.

Theme; 5 Technical Environment

Technical Environment, the fifth major theme identified in this review, refers to the quality, reliability, and adaptability of the technological infrastructure and digital platforms that support teaching and learning in higher education (Fathema et al., 2015; Meet et al., 2022). While other readiness dimensions focus on individual, pedagogical, and institutional factors, Technical Environment addresses the objective technological conditions that faculty must interact with on a daily basis. The literature shows that even when faculty members are cognitively prepared, pedagogically skilled, emotionally ready, and institutionally supported, poor technical environments can lead to negative perceptions, frustration, and disengagement (Teo, 2011; Sharma & Saini, 2022). Conversely, a high-quality technical environment fosters positive experiences, enhances trust in technology, and supports sustained behavioural intention (Khong et al., 2023; Al-Adwan et al., 2025). The core sub-theme under Technical Environment is Learning Environment Quality.

Learning Environment Quality

Learning Environment Quality refers to faculty members' perceptions of the usability, reliability, interoperability, and responsiveness of the digital learning platforms and tools provided by their institutions (Fathema et al., 2015; Meet et al., 2022). This includes Learning Management Systems

(LMS), virtual classrooms, AI-based tools, and collaborative platforms. Across the reviewed studies, Learning Environment Quality consistently emerged as a strong predictor of faculty perceptions and readiness. Fathema et al. (2015) found that system quality—defined by platform stability, ease of navigation, content compatibility, and performance speed—directly influenced both Perceived Ease of Use and Perceived Usefulness, which in turn shaped behavioural intention toward LMS adoption. Similarly, Meet et al. (2022) reported that technical reliability and system responsiveness were among the strongest drivers of faculty willingness to adopt MOOCs during the COVID-19 shift to online teaching.

Khong et al. (2023) further highlighted that negative experiences with unstable platforms (e.g., video conferencing failures, content access delays) significantly increased Technology Anxiety and reduced positive attitudes toward continued online teaching. In contrast, when faculty perceived the learning environment as stable, responsive, and supportive of their instructional goals, they were more likely to engage in innovative pedagogical practices and sustain technology use beyond emergency teaching scenarios. Al-Adwan et al. (2025) reinforced this finding, showing that system quality and platform adaptability played a key role in enabling Continuous Use Intention among higher education faculty.

Studies also revealed that disciplinary differences can influence perceptions of Learning Environment Quality. Sharma and Saini (2022) observed that non-STEM faculty often reported greater challenges with platform adaptability, particularly when digital tools were designed with STEM-oriented functionalities. This finding underscores the importance of ensuring that learning environments are not only technically sound but also flexible and inclusive to support diverse teaching approaches across disciplines (Ertmer & Ottenbreit-Leftwich, 2010).

In conclusion, Learning Environment Quality is a critical sub-theme of Technical Environment and a foundational enabler of positive faculty perceptions and readiness. A technically robust, adaptable, and user-friendly learning environment enhances ease of use, builds positive attitudes, and supports both initial adoption and sustained engagement with digital learning technologies. Its inclusion in the proposed model reflects the strong empirical consensus that technical quality matters not only for user satisfaction but also for shaping the broader trajectory of faculty readiness and pedagogical innovation in the digital era.

Theme 6 Behavioural Intention to Use Technology

Behavioural Intention to Use Technology, the sixth and final theme identified in this review, represents the faculty members' conscious willingness and motivational commitment to adopt, use, and sustain digital learning technologies in their teaching practice (Davis, 1989; Venkatesh et al., 2003). Unlike the other readiness dimensions, which represent antecedent factors, Behavioural Intention is positioned as the key outcome variable in most technology adoption models, including TAM, UTAUT, and their many educational extensions (Granić & Marangunić, 2019; Al-Adwan et al., 2025). Behavioural Intention reflects not only whether faculty are currently using digital tools but whether they are psychologically prepared and motivationally inclined to continue using them and to engage in deeper levels of pedagogical innovation. The literature consistently highlights that Behavioural Intention is a strong predictor of actual usage and a critical focus for institutional strategies aimed at fostering long-term digital transformation (Teo, 2011; Fathema et al., 2015).

Across the reviewed studies, Behavioural Intention was influenced by multiple antecedent factors spanning cognitive, affective, pedagogical, institutional, and technical dimensions. Cognitive factors

such as Perceived Usefulness and Perceived Ease of Use remained foundational predictors of Behavioural Intention in nearly all TAM-based studies (Davis, 1989; Teo, 2011). For example, Fathema et al. (2015) demonstrated that both PU and PEU exerted strong positive effects on faculty members' intention to use LMS platforms, with the relationship mediated by system quality and institutional support. Similarly, Granić and Marangunić (2019), in their comprehensive review of TAM studies in education, confirmed that these cognitive constructs remained robust predictors of intention across diverse higher education contexts.

Affective factors also played a pivotal role. Teo (2011) and Joo et al. (2018) found that Attitude Toward Technology significantly predicted Behavioural Intention, often mediating the effects of cognitive beliefs. Conversely, high levels of Technology Anxiety were shown to negatively influence intention, particularly among faculty with limited prior experience or weak institutional support (Sánchez-Prieto et al., 2016). Pedagogical factors, particularly TPACK, also influenced intention: Khong et al. (2023) and Sharma and Saini (2022) reported that faculty with strong TPACK not only adopted technology more readily but also developed sustained intention to innovate pedagogically using digital tools.

Institutional factors were likewise influential. Al-Adwan et al. (2025) demonstrated that Institutional Support and Facilitating Conditions both had direct and indirect effects on Behavioural Intention and Continuous Use Intention, suggesting that a supportive organisational climate is essential for building long-term faculty commitment. The Technical Environment also mattered: Meet et al. (2022) and Fathema et al. (2015) found that high-quality, reliable, and adaptable digital platforms enhanced Perceived Ease of Use and Attitude, thereby fostering stronger Behavioural Intention.

Interestingly, several studies highlighted that Behavioural Intention is not a static endpoint but an evolving construct shaped by ongoing experiences. Al-Adwan et al. (2025) argued that Continuous Use Intention and the formation of habitual technology use depend not only on initial cognitive and affective readiness but also on the sustained alignment of institutional support and technical quality with faculty pedagogical needs. Khong et al. (2023) similarly noted that post-pandemic shifts in teaching models have required faculty to continually reassess their behavioural intention as they balance face-to-face, online, and hybrid modalities.

In conclusion, Behavioural Intention to Use Technology serves as the critical proximal indicator of faculty readiness and sustained engagement with digital learning technologies. It is shaped by the dynamic interplay of cognitive perceptions, affective dispositions, pedagogical competence, institutional support, and technical environment quality. The strong empirical consensus across the literature underscores that multi-dimensional interventions—addressing all facets of readiness—are required to build and maintain strong behavioural intention among faculty. Its inclusion as the outcome construct in the proposed model is thus fully justified and essential for informing both research and practice in advancing digital transformation in higher education.

To further synthesise the results of the thematic analysis and to clarify the empirical relationships identified in the literature, Table 4 provides a consolidated summary of how each factor—across the six themes and sub-themes—influences faculty members' perceptions, readiness, and behavioural intention to use digital learning technologies. The table highlights both positive and negative relationships and illustrates the multidimensional pathways through which cognitive, pedagogical, affective, institutional, and technical factors shape technology adoption outcomes. It also provides key supporting references for each relationship, drawn from the 25 studies included in this systematic review. This summary supports

the construction of the proposed conceptual model and offers a visual map of the integrative nature of faculty readiness in the context of digital transformation in higher education.

Table 3. Summary of Factors Affecting Faculty Perceptions and Readiness Toward Digital Learning Technology

Theme / Sub-Theme	Affects...	Nature of Effect	Key Supporting References
Cognitive Readiness			
Perceived Usefulness (PU)	Behavioural Intention; Positive Attitude; Engagement	Strong positive	Davis (1989); Fathema et al. (2015); Teo (2011)
Perceived Ease of Use (PEU)	Behavioural Intention; PU; Self-Efficacy	Positive	Davis (1989); Joo et al. (2018); Granić & Marangunić (2019)
Prior Experience with Technology	PU; PEU; Technology Anxiety; Self-Efficacy	Positive (reduces anxiety)	Sánchez-Prieto et al. (2016); Sharma & Saini (2022)
Self-Efficacy	Behavioural Intention; Attitude; Anxiety	Strong positive (reduces anxiety)	Joo et al. (2018); Holden & Rada (2011); Al-Adwan et al. (2025)
Pedagogical Readiness			
TPACK	Behavioural Intention; PU; Teaching Innovation	Strong positive	Khong et al. (2023); Sharma & Saini (2022); Thohir et al. (2023)
Affective Readiness			
Attitude Toward Technology	Behavioural Intention	Strong positive	Teo (2011); Joo et al. (2018); Al-Adwan et al. (2025)
Technology Anxiety	Behavioural Intention; PEU; PU	Negative	Sánchez-Prieto et al. (2016); Holden & Rada (2011); Khong et al. (2023)
Institutional Readiness			
Facilitating Conditions	PEU; PU; Behavioural Intention; Continuous Use	Strong positive	Fathema et al. (2015); Meet et al. (2022); Al-Adwan et al. (2025)
Institutional Support	Self-Efficacy; Attitude; Behavioural Intention; Continuous Use	Strong positive; reduces anxiety	Ertmer & Ottenbreit-Leftwich (2010); Khong et al. (2023); Sharma & Saini (2022); Al-Adwan et al. (2025)
Behavioural Intention (Outcome)	Actual Use; Continuous Use; Pedagogical Innovation	Outcome variable; dependent on all	Davis (1989); Venkatesh et al. (2003); Granić & Marangunić (2019); Al-Adwan et al. (2025)

		factors	
Technical Environment			
Learning Environment Quality	PU; PEU; Attitude; Technology Anxiety; Behavioural Intention	Strong positive; mitigates anxiety	Fathema et al. (2015); Meet et al. (2022); Khong et al. (2023); Sharma & Saini (2022)

As illustrated in Table 4, the factors influencing faculty readiness and perceptions toward digital learning technology are highly interconnected and operate across multiple dimensions**.** Cognitive, pedagogical, affective, institutional, and technical factors each exert distinct yet complementary effects on faculty members' behavioural intention and actual technology use. The consistency of findings across diverse studies and contexts reinforces the importance of adopting a holistic and integrative approach when designing interventions to promote digital transformation in higher education. These relationships form the empirical foundation for the proposed conceptual model presented in the following section.

Discussion

This systematic review synthesised existing empirical and theoretical research on teacher readiness and perceptions toward digital learning technology in higher education. Drawing on 25 peer-reviewed studies, the thematic analysis identified six interrelated themes—Cognitive Readiness, Pedagogical Readiness, Affective Readiness, Institutional Readiness, Technical Environment, and Behavioural Intention to Use Technology—each of which plays a critical role in shaping faculty attitudes, motivations, and engagement with digital tools. The findings reveal several key patterns and insights that contribute to the broader understanding of faculty technology adoption in higher education.

First, the review confirmed that Cognitive Readiness—encompassing Perceived Usefulness (PU), Perceived Ease of Use (PEU), Prior Experience with Technology, and Self-Efficacy—remains a core predictor of faculty behavioural intention. Consistent with foundational models such as TAM (Davis, 1989) and extended frameworks (Granić & Marangunić, 2019), faculty members who perceive digital tools as useful and easy to use, and who have prior experience and high self-efficacy, are more likely to engage in both initial adoption and sustained use. This finding aligns with Fathema et al. (2015), Joo et al. (2018), and Al-Adwan et al. (2025), who emphasise that fostering positive cognitive perceptions is a necessary but not sufficient condition for long-term engagement.

Second, Pedagogical Readiness, represented by TPACK, emerged as a critical enabler of pedagogical innovation and sustained behavioural intention. Faculty members with strong TPACK demonstrate greater confidence in integrating digital tools meaningfully with subject content and instructional strategies (Khong et al., 2023; Sharma & Saini, 2022; Thohir et al., 2023). Importantly, TPACK not only enhances cognitive perceptions (PU and PEU) but also strengthens attitudinal commitment to using technology for transformative teaching. This underscores the need for professional development that goes beyond technical training and cultivates pedagogical competence in digital integration.

Third, Affective Readiness—through Attitude Toward Technology and Technology Anxiety—was shown to significantly mediate the relationship between readiness factors and behavioural intention. Faculty with positive attitudes are more likely to experiment with and sustain technology use (Teo, 2011; Joo et al., 2018), while high levels of technology anxiety act as a barrier to adoption, even among technically competent individuals (Sánchez-Prieto et al., 2016; Holden & Rada, 2011). Several studies

(Khong et al., 2023; Sharma & Saini, 2022) further revealed that Institutional Support can help mitigate anxiety, highlighting the importance of building psychologically safe environments for technology experimentation.

Fourth, Institutional Readiness—through Facilitating Conditions and Institutional Support—proved to be a pivotal organisational determinant of faculty readiness and behavioural intention. The literature strongly supports that the presence of reliable infrastructure, training, leadership vision, and collaborative peer culture enhances both initial and sustained engagement with digital technologies (Fathema et al., 2015; Meet et al., 2022; Al-Adwan et al., 2025; Ertmer & Ottenbreit-Leftwich, 2010). In contrast, the absence of institutional support was consistently linked to fragmented, uneven, or reluctant adoption patterns (Khong et al., 2023; Sharma & Saini, 2022), reinforcing that digital transformation requires not only individual faculty readiness but organisational readiness as well.

Fifth, the quality of the Technical Environment, operationalised through Learning Environment Quality, emerged as a strong and sometimes underappreciated determinant of faculty perceptions and readiness. Reliable, adaptable, and user-friendly digital platforms enhance PU, PEU, and positive attitudes, while poor system performance erodes faculty trust and increases technology anxiety (Fathema et al., 2015; Meet et al., 2022; Khong et al., 2023). This highlights that technology infrastructure quality is not merely a background condition but a critical enabler of faculty engagement.

Finally, Behavioural Intention to Use Technology was confirmed as the proximal outcome variable of readiness and perceptions, directly predicting actual use and Continuous Use Intention (Davis, 1989; Venkatesh et al., 2003; Al-Adwan et al., 2025). The review further revealed that Behavioural Intention is dynamic and evolving, shaped not only by initial readiness factors but also by faculty members' ongoing experiences with institutional support, technical quality, and pedagogical outcomes (Khong et al., 2023). This finding underscores the importance of viewing faculty technology adoption as a process, not a single event.

Together, these findings highlight that faculty readiness toward digital learning technology is inherently multi-dimensional and shaped by the dynamic interplay of cognitive, pedagogical, affective, institutional, and technical factors. Importantly, the literature suggests that interventions targeting only one dimension (e.g., technical training alone) are unlikely to achieve sustainable transformation unless they are embedded in a broader institutional strategy that addresses all facets of readiness (Al-Adwan et al., 2025; Ertmer & Ottenbreit-Leftwich, 2010; Khong et al., 2023).

Moreover, while many factors operate synergistically, the review also identified areas of variation across disciplines, institutional contexts, and faculty demographics. For example, non-STEM faculty frequently reported greater technology anxiety and lower perceptions of learning environment quality (Sharma & Saini, 2022), suggesting the need for more discipline-sensitive support structures. Similarly, faculty in resource-constrained settings (Ifinedo, 2017) reported greater dependence on institutional readiness factors, highlighting the importance of contextual tailoring in technology adoption strategies.

In sum, this review provides a comprehensive synthesis of the multi-level determinants shaping faculty readiness and perceptions toward digital learning technology. The findings strongly support the conceptualisation of readiness as a systemic construct requiring holistic, sustained, and institutionally supported interventions. These insights have significant implications for both research and practice, as discussed in the next section.

Implications for Practitioners

The findings of this review offer several actionable implications for practitioners, particularly higher education leaders, faculty developers, instructional designers, and policy-makers tasked with guiding the digital transformation of teaching and learning. The multidimensional nature of faculty readiness highlights that fostering meaningful and sustained adoption of digital learning technologies requires strategic, integrated, and context-sensitive approaches at the institutional level.

Firstly, the results suggest to design Professional Development that builds both cognitive and pedagogical readiness. Practitioners should prioritise professional development programs that go beyond basic technical training to cultivate faculty members' Perceived Usefulness (PU), Perceived Ease of Use (PEU), Self-Efficacy, and TPACK. Research shows that training which explicitly connects technology affordances with discipline-specific pedagogical strategies fosters more positive attitudes and sustained adoption (Koh & Chai, 2016; Polly et al., 2020). Institutions should provide ongoing, iterative learning opportunities—not one-off workshops—that enable faculty to experiment, reflect, and gradually develop robust digital pedagogies (Philipsen et al., 2019).

Secondly, the results indicate that affective readiness can be effectively enhanced when addressed proactively through supportive environments. The review underscores the importance of affective factors such as Technology Anxiety and Attitude Toward Technology in shaping faculty behavioural intention. Practitioners should implement interventions that explicitly aim to reduce anxiety—such as peer mentoring, low-stakes experimentation spaces, and support communities—while fostering a positive institutional narrative around technology use (Joo et al., 2018; Philipsen et al., 2019). Faculty should be supported to share both successes and failures in technology integration, helping to normalise experimentation and risk-taking (Ertmer & Ottenbreit-Leftwich, 2010).

Thirdly, it is essential to strengthen Institutional Support and Facilitation Structures. Institutional leadership plays a critical role in shaping Institutional Readiness. As shown in this review and corroborated by recent research (Brooks & Grajek, 2021), visible leadership commitment, a shared vision for digital pedagogy, and investment in infrastructure and support services significantly enhance faculty engagement with technology. Practitioners should ensure that Facilitating Conditions—including reliable technical support, accessible training, and responsive IT services—are embedded into everyday teaching contexts (Al-Adwan et al., 2025). Moreover, institutional policies should reward and recognise faculty who engage in innovative digital teaching, promoting positive social norms and peer modelling (Wang et al., 2021).

Fourthly, practitioners should prioritise the quality and design of the Technical Environment. The review highlights that Learning Environment Quality is a critical enabler of positive perceptions and readiness. Practitioners should prioritise selecting and maintaining robust, interoperable, and user-friendly digital platforms. Regular usability testing, faculty feedback mechanisms, and iterative platform improvements should be built into institutional processes (Brooks & Grajek, 2021). In addition, discipline-sensitive customisation of platforms is essential, as different fields have varying pedagogical needs (Sharma & Saini, 2022). For example, visual-based disciplines may require richer multimedia tools, while text-based disciplines may prioritise discussion forums and collaborative writing spaces.

Fifthly, fostering sustainable Behavioural Intention among faculty requires long-term strategic interventions. Behavioural Intention is not static; it evolves based on faculty experiences and the institutional environment. Practitioners should implement long-term engagement strategies that continuously reinforce faculty motivation and confidence. These may include career-long professional

learning communities (PLCs), regular technology showcases, and leadership support for digital scholarship (Philipsen et al., 2019; Wang et al., 2021). Institutions should also monitor faculty technology use over time, identifying both early adopters and those in need of targeted support (Brooks & Grajek, 2021).

Finally, practitioners must ensure that all interventions are tailored to the diverse needs and contexts of faculty**.** practitioners must recognise that faculty readiness is shaped by disciplinary, cultural, demographic, and institutional differences. One-size-fits-all interventions are unlikely to be effective. Faculty in non-STEM disciplines or in resource-constrained contexts often face unique barriers that require tailored support (Sharma & Saini, 2022; Ifinedo, 2017). Likewise, part-time, adjunct, and older faculty may have different levels of readiness and should be supported accordingly (Wang et al., 2021). Conducting readiness audits and using data-driven approaches to target support can help ensure that interventions are equitable and inclusive.

In sum, this review demonstrates that fostering faculty readiness for digital learning technology adoption is a complex, multi-level challenge that requires intentional institutional design. Practitioners must move beyond narrow technical solutions and embrace a systemic approach that integrates cognitive, pedagogical, affective, institutional, and technical dimensions. By doing so, they can create institutional ecosystems where all faculty are empowered to engage with digital tools in ways that enhance teaching, learning, and educational equity.

Limitations of this Study

This study, while comprehensive in its scope and systematic in its approach, is subject to several limitations that should be acknowledged. Firstly, the review focused exclusively on peer-reviewed research articles and scholarly papers; government reports, policy documents, and grey literature were not included. As such, important insights from national or institutional digital transformation initiatives may not be reflected in the findings. Secondly, the selection of literature was deliberately narrowed to studies where faculty perceptions and readiness toward digital learning technologies were explicitly addressed, which may have led to the exclusion of broader studies on technology use in higher education that did not foreground these constructs. Thirdly, the review relied on a qualitative thematic analysis to synthesise findings across studies; no quantitative meta-analysis or statistical synthesis was conducted. As a result, while the thematic relationships identified are well-supported conceptually, their relative effect sizes and statistical strengths could not be determined. These limitations suggest that future research could broaden the scope to incorporate policy perspectives, apply quantitative meta-analytic techniques, and explore a wider range of factors influencing faculty engagement with digital learning technologies.

Future Research Directions

Building on the limitations identified, this review highlights several promising directions for future research. First, there is a need to integrate policy-level analyses and government reports into future reviews to capture a more complete picture of how institutional and national strategies influence faculty readiness and perceptions. Second, researchers should consider broadening the scope of analysis to include mixed-methods studies and longitudinal research, which can provide richer insights into how faculty readiness evolves over time and across different stages of digital adoption. Third, future studies should employ quantitative meta-analytic techniques to synthesise effect sizes and determine the relative

influence of various cognitive, affective, pedagogical, institutional, and technical factors on behavioural intention. Fourth, there is a need for more comparative and cross-cultural studies that examine how contextual factors—such as institutional type, geographic region, discipline, and resource availability—moderate the relationships identified in this review. Finally, future research should explore how emerging technologies such as AI-based tools, learning analytics, and immersive environments (e.g., VR/AR) are reshaping faculty perceptions and readiness, and how professional development can be adapted to prepare educators for these evolving digital landscapes. Addressing these gaps will contribute to a more nuanced and actionable understanding of how to support faculty in advancing sustainable digital transformation in higher education.

Conclusion

This systematic review contributes to a deeper understanding of the multi-dimensional factors that influence higher education teachers' readiness and perceptions toward digital learning technology. Synthesising evidence from 25 peer-reviewed studies published between 1989 and 2025, the review identified six interrelated themes—Cognitive Readiness, Pedagogical Readiness, Affective Readiness, Institutional Readiness, Technical Environment, and Behavioural Intention to Use Technology—that together shape faculty adoption behaviours. The findings highlight that faculty readiness is not determined by individual capability alone but is deeply influenced by institutional support, technical quality, and affective climate within the organisation. Moreover, readiness is dynamic, evolving in response to ongoing experiences and the changing digital ecosystem in higher education. For practitioners, the review underscores the importance of adopting integrated, systemic strategies that address all facets of readiness rather than focusing narrowly on technical training. For researchers, the study points to several avenues for future inquiry, including meta-analytic synthesis, cross-cultural comparisons, and investigations into emerging technologies. Ultimately, the sustainable transformation of higher education in the digital era will depend on our collective ability to empower faculty through thoughtful, evidence-based approaches that foster both competence and confidence in leveraging digital tools to enhance teaching and learning.

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