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Continuance Intention of Users to Use E-Learning in Professional Qualification Certification: A PRISMA-based Systematic Literature Review

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ABSTRACT

This paper aims to identify and analyse the key factors that affect the continuance intention of users to use e-learning for professional qualification certification and conduct a comprehensive review of the main research results in the literature. While systematic reviews on e-learning continuance intention exist, few specifically focus on the unique context of professional certification, which is characterised by exam-driven pressures and career-oriented motivations. This study addresses this gap. The study adopts the systematic literature review (SLR) method, draws on the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) protocol, and retrieves relevant articles from electronic databases such as Web of Science, Scopus, Emerald, and Science Direct. The research focuses on key factors and user characteristics. The results of the systematic analysis show that the main factors affecting the continuance intention of users include: (1) the technical quality and functionality of the learning platform, system usability, platform functions and technical support; (2) users' internal learning motivation and demand for professional certification; (3) the quality of course design, customisation flexibility and learning efficiency; (4) social influence, the construction of learning community and environment factors have a significant effect on user emotions and resource security. The study provides detailed, context-specific optimisation suggestions for e-learning system designers and educational institutions.

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Improving technical performance, enhancing course design, and strengthening social support can significantly improve users continued use intention, especially in the rapidly changing environment after the epidemic.

Keywords: Continuance intention, e-learning, Prisma, professional certification, systematic literature review

INTRODUCTION

In the post-epidemic era, e-learning has transformed from a short-term alternative to traditional education to a long-term, effective learning model, demonstrating its lasting impact in the field of modern education. With the advancement of technology, e-learning has proven to be not only an emergency measure but also an important part of the future of education (Li, 2022). With the increasing attention paid to the Sustainable Development Goals (SDGs) and the concept of lifelong learning in global education, e-learning provides a new opportunity to achieve this goal (Holmes et al., 2022). For students of professional qualification certificates, the study of their continuance intention to use e-learning is crucial. E-learning provides a flexible and efficient learning environment for professional qualification certification. By providing a rich variety of teaching videos, interactive simulations, and assessment tools, students can learn independently according to their tight schedules, which is particularly suitable for working people who need to find a balance between work and study (Xavier & Meneses, 2022). At the same time, e-learning systems are often equipped with intelligent algorithms, which can provide personalised learning paths to meet the needs of different students and improve the efficiency of learning (Liu et al., 2023). E-learning is very cost-effective. It can reduce expenses such as venues, transportation, and materials, while providing free or low-cost course options, so that more learners can easily obtain the required knowledge (Meryem et al., 2023).

Considering the development of e-learning, modern professional qualification students also face other challenges in the learning process. Unstable network connections and equipment failures seriously threaten the learning experience. For students with low technical skills, the highly technology-dependent e-learning environment poses additional difficulties (Kassymova et al., 2020). In addition, many e-learning courses are not accredited by formal educational institutions, which also has a negative impact on students' academic recognition (Groome & Cunningham, 2024). There are also obvious problems with the user experience of e-learning platforms, such as complex operation processes, which further reduce students' learning enthusiasm (Nedungadi & Raman, 2012). Inaccuracy of information and outdated content are challenges that e-learning platforms need to face (Sun et al., 2008). With the widespread application of e-learning platforms, data security and user privacy issues have become more important.

Once students' personal information and learning data are leaked, it will affect their learning motivation (Anwar, 2021). In addition, some students are sceptical about e-learning due to their distrust of e-learning methodology, and they prefer traditional face-to-face teaching methods (Terblanche & Lubbe, 2024). Long-term e-learning also requires students to have a high degree of self-motivation and good time management skills, but many students may find it difficult to continue learning in an environment without external supervision (Al-Awlaqi & Aamer, 2022).

Many problems have made us focus on how to enable users of professional qualification certificates to use them from short-term replacement in the post-epidemic era to long-term use, which requires exploring users' continuance use intentions, as well as their attitudes and preferences for e-learning. Through a review of relevant literature, this study can gain a deeper understanding of users' needs in using e-learning.

Continuance Intention refers to a user's intention and tendency to continue using a service or product after their initial experience. In the e-learning environment, it reflects students' psychological state and behavioural tendencies to continue participating in and using a specific online learning model or platform (Rabaa'i et al., 2021). The study of continuance intention originated from information systems and consumer behaviour theory. Initially, it focused on how user satisfaction affects their continuance intention. A solid theoretical foundation underpins this concept, primarily drawn from models such as the Expectation-Confirmation Model (ECM) (Khan & Saleh, 2023), the Technology Acceptance Model (TAM) and its extensions (Tbaishat et al., 2026), and the Unified Theory of Acceptance and Use of Technology (UTAUT/UTAUT2) (Scharron, 2025). Furthermore, Self-Determination Theory (SDT) (Zhou & Zhang, 2024) provides insights into the role of intrinsic and extrinsic motivation. Building upon this foundation, the theoretical roots of continuing intention research extend back to foundational work conducted well before 2020. Bhattacherjee (2001) pioneered the application of the Expectation-Confirmation Model (ECM) to information systems, proposing the IS continuance model, which remains a cornerstone of the field. Subsequently, researchers integrated ECM with models like TAM and the Theory of Planned Behaviour (TPB) to create more comprehensive frameworks (Hsu et al., 2004). Nabavi et al. (2016), in their systematic review of 191 studies on information technology continuance intention published between 2001 and 2014, demonstrated the sustained growth of this research stream and the establishment of expectation confirmation, perceived usefulness, satisfaction, and habit as core variables.

As e-learning diversified, research in the years immediately preceding the pandemic expanded these foundational insights into new contexts. Zhou (2017) extended the ECM to examine learners' continuance intention in MOOCs for online collaborative

learning, finding that knowledge outcome, social influence, and satisfaction were significant predictors. S. Yang et al. (2019), drawing on self-determination theory, investigated mobile learning continuance among Chinese college students, revealing that perceived learning support, self-management of learning, and peer influence significantly affected learning involvement and subsequently continuance intention. Dai et al. (2020) further advanced the field by incorporating habit and perceived MOOC performance into an extended ECM framework, revealing that habit was a significant determinant of continuance intention beyond the traditional cognitive factors. Collectively, these studies not only validated earlier theoretical frameworks across new contexts (mobile learning, MOOCs, diverse cultural settings) but also introduced novel constructs such as metacognition, habit, and interactivity, thereby enriching the theoretical landscape.

While these theories are widely applied in general e-learning contexts, their specific interplay and relative importance in the goal-oriented, high-stakes environment of professional qualification certification remain underexplored. Based on theories such as the Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAUT), users' perceived ease of use, perceived usefulness, and satisfaction will directly affect their continuance intention (T. Yang et al., 2023). Educational institutions and learning platforms can take a series of measures to improve users' continuance intention (Sitar-Tăut, 2024). Although several systematic literature reviews have examined continuance intention in broader e-learning or MOOC contexts (Alshammari et al, 2024; Romadhon et al, 2023), there is a scarcity of reviews focussing specifically on professional qualification certification. At present, there are few literature reviews on the continuance intention of e-learning for professional certificate students, especially SLR. This review aims to fill this gap by synthesising post-pandemic literature (2021-2024) to uncover factors unique to this context, such as exam pressure, certification value, and career advancement motives, thereby offering distinct insights beyond general e-learning reviews. This article will analyse the factors affecting users' continuance intention from the perspective of the post-epidemic era.

Therefore, the main research question designed in this paper is: What factors in e-learning affect the continuance use intention of professional certificate students? In the field of professional certification, a deep understanding of the continuance use intention of e-learning users is the key to promoting research development (Lee, 2010; Zhang et al., 2017). Clarifying this research question will not only help find the motivation for continuance participation in the e-learning environment but also provide a theoretical basis for designing more effective learning platforms. The systematic literature review in accordance with the PRISMA model has been used to address this research question to provide educational institutions and policymakers

with insights into the underlying factors impacting the continuance use of e-learning.

METHODOLOGY

The PRISMA is an established set of reporting guidelines that form the academic literature's methodological underpinning of systematic reviews and meta-analyses (Lee, 2010; Sun et al., 2008). The current study attempts to identify significant determinants of e-learning continuance intention in professional certification students through a systematic review of 22 empirical studies. Thus, this study aims to investigate the following research question: "What are the factors of e-learning that impact the continuance use intention of students for professional certificates? By synthesising extant findings, this study deepens our understanding of the complex e-learning continuance behaviour, especially in professional certification contexts, and guides future research pathways.

To ensure the analytical manageability and focus of the review, the selection remained tight with clear parameters. Only articles from 2021 to 2024, which covered post-pandemic education trends, were included—English-language publications only, with no geographical limitation (extensive coverage, ideally worldwide). We acknowledge that excluding non-English literature may introduce a selection bias, potentially overlooking relevant studies from non-English speaking regions. Furthermore, studies were excluded based on the following methodological and relevance criteria: (1) the research topic was irrelevant to the core focus of this review, specifically, studies not centered on e-learning for professional, vocational, or career-oriented certification; (2) the studies exhibited fundamental methodological limitations, such as an unsound scientific premise or an insufficient sample size for quantitative studies, this was defined as a sample size below 100 (White, 2022). This threshold was chosen as smaller samples may lack statistical power for the complex multivariate analyses commonly used in this field, potentially yielding unstable parameter estimates (Lakens, 2022). For qualitative studies, the assessment was based on the depth and justification of the sample (Hennink & Kaiser, 2022); and (3) the publications were non-peer-reviewed or duplicates. Ultimately, the goal is to provide deep insights into the use of e-learning resources, with recommendations for institutions and policymakers. Our systematic exploration aims to enhance professional education and qualification certification systems through deeper academic scrutiny and research focused on Professional Education and Certification. We strive to frame and foster the ongoing and emerging trends in standards and qualification frameworks in an educational environment through methodological discourse.

The literature review encompassed multiple electronic research repositories, strategically selecting platforms such as Emerald, Science Direct, Scopus, Web of Science, and IEEE Xplore. These databases provide extensive scholarly resources,

enabling a multidisciplinary exploration of relevant research literature across various academic and professional fields.

Strategic Systematic Searching for Articles of Selection Process Identification

Researchers then identified relevant academic literature addressing user continuance intention in the context of e-learning for professional qualification certificates as part of the systematic literature review's initial phase. This identification stage started by identifying key research keywords (i.e., relevant terms associated with the subject being examined). For the purpose of selecting the main keywords, we chose the keywords "e-learning", "continuance use intention", "professional qualification certificate", and "user participation", with an additional search for potential synonyms.

Consultation with dictionaries, thesauruses, encyclopedias, and prior research publications illustrated an expanded keyword search. This strategy provided complete retrieval of literature reflecting different semantic expressions. The keywords were broadened to include terms like “online learning”, “digital education”, and “virtual learning” for “e-learning”.

Similarly, “continuance use intention” was expanded to include similar terms, such as “Continuing Intentions”, “continuous use”, and “long-term Use”. Other terms that were added to the already diverse terminology describing "occupational qualification certificate" and user involvement were abbreviations like "Occupational License Accreditation", "virtual learning environment", "occupational certification programme", "workplace qualification validation", and "e-education". This broad inclusion criterion allowed for a more comprehensive and refined literature search. After assembling a comprehensive list of keywords and synonyms, we constructed search strings to guide the systematic search in multiple databases. These search strings used logical operators (AND, OR, NOT) to effectively combine keywords. The search strings were constructed as follows:

> ("E-Learning Continuance Intention" OR "Continuing Intentions in Online Education" OR "E-Learning Engagement" OR "Online Learning Satisfaction" OR "Long-term Use of Online Learning Platforms" OR "Continuity of Online Education" OR "Factors Influencing E-Learning Continuance" OR "Online Learning Sustainability") AND ("Occupational License Accreditation" OR "Virtual Learning Environment" OR "Occupational Certification Programme" OR "Workplace Qualification Validation" OR "E-Education")

Screening

To maintain research rigour and precision, we established comprehensive screening criteria for article selection. Inclusion criteria include: the selected articles must be English journal articles published between 2021 and 2024 to ensure that the research results can

reflect the trend of the post-epidemic era; the scope of literature research covers the world and is not restricted to specific regions (Figure 1). Exclusion criteria include non-journal articles, non-English language articles, literature published before 2020, irrelevant research topics, lack of scientific rigour or lack of rigorous methodology, and literature with too small a sample size or not peer reviewed. At the same time, for possible duplicate articles in the database, strict duplication was carried out during the screening process. In the preliminary screening stage, the research team used four electronic databases, Emerald, Science Direct, Scopus, and Web of Science (WoS), to search for relevant literature by keywords, and retrieved a total of 170 documents, and removed 6 duplicate records. The remaining 164 documents entered the further screening stage.

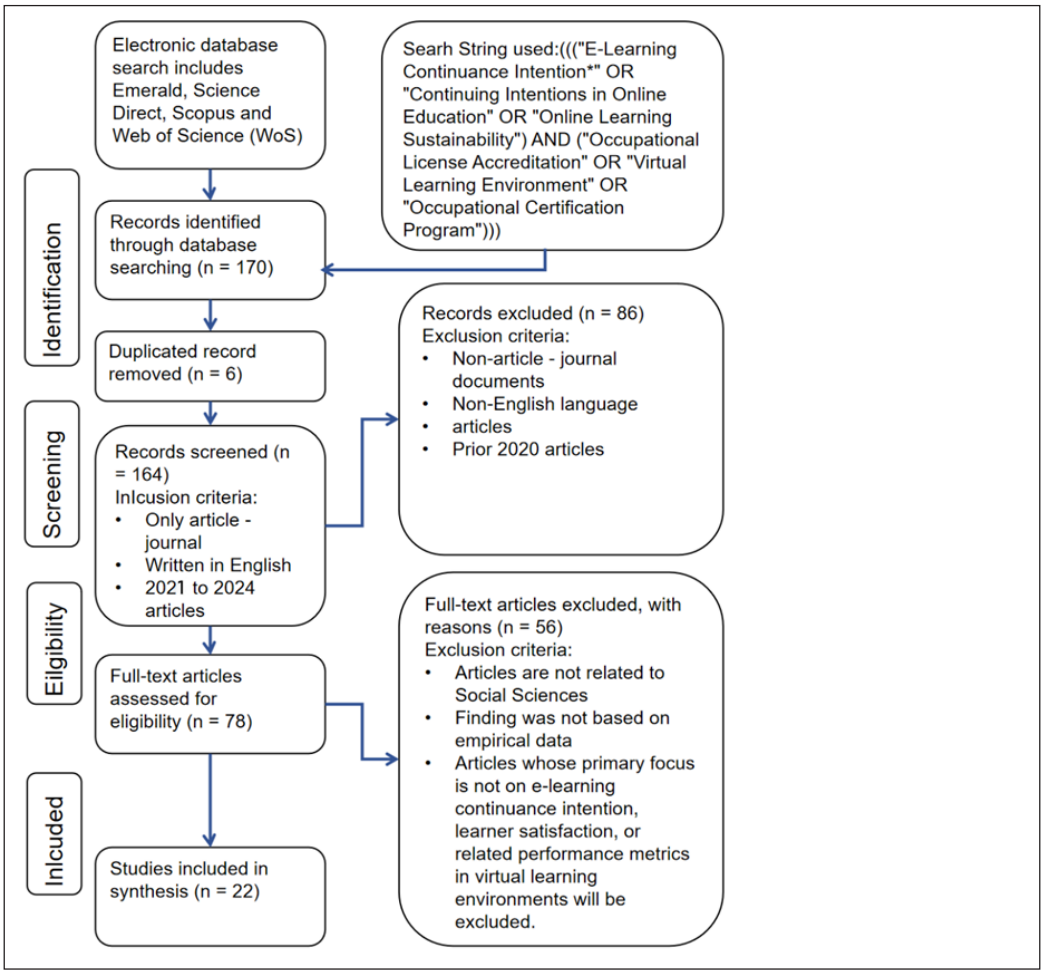

Figure 1. Identification of studies via databases and registers from PRISMA 2020

During the initial screening process, the literature was screened according to the following inclusion and exclusion criteria: the inclusion criteria included only selecting articles published in journals, and these articles must be written in English and published between 2021 and 2024; the exclusion criteria included non-journal articles, articles not written in English, and literature published before 2020. In the end, a total of 86 articles were excluded, and only 78 articles entered the next stage of full-text reading and in-depth analysis.

Eligibility

During the full text evaluation stage, the research team conducted an in-depth analysis of 78 articles, focusing on the title, abstract, and main content of the articles to ensure that they met the inclusion criteria of the review. The exclusion criteria included the following: first, articles whose research topics were not related to the field of social sciences, specifically, studies not within education, information systems, psychology, or management domains relevant to technology adoption; second, articles whose research findings were not based on empirical data; third, articles whose core focus did not involve e-learning continuance use intention, learner satisfaction, or performance indicators related to virtual learning environments. Following the rigorous screening process, 22 articles successfully passed the selection criteria and were subsequently incorporated into the comprehensive analytical review, with 56 articles being eliminated during the initial screening phase.

Data Extraction

Summary data from the 22 included studies were abstracted systematically using a standard data extraction form. Data extracted included the author(s) and year, country, study design, sample description, theoretical background adopted, primary independent and dependent variable of interest, as well as main findings related to continuance intention. Synthesis was conducted using thematic analysis. Initially, determinants of continuance intention were inductively coded from the results sections. These codes were clustered to derive themes through an iterative approach of discussion and consensus among researchers, which resulted ultimately in the formation of four main themes and twelve sub-themes described in the results section.

Quality Assurance

The research involved the use of an expert evaluation panel consisting of four experts in the fields of online learning research, organisational behaviour, and professional education. Specialists carried out extensive evaluations of candidate articles using the PRISMA framework. To ensure consistency and resolve discrepancies, the team held calibration meetings to establish a common interpretation of the inclusion/exclusion criteria. Key criteria included a clear sample definition, valid and reliable measurement of outcomes, appropriate statistical analysis, and management of confounding factors. All studies met the basic threshold for inclusion. For articles where initial screening decisions differed, a consensus was reached through

discussion. This process enhances inter-coder reliability. The selection of the articles required consensus between the assessment team. They analysed and deliberated articles with any divergent opinion, including those that fulfilled the study's aims and methods with respect to research. This strong evaluation strategy added to the study's scientific robustness as well as credibility.

RESULTS

According to this systematic literature review based on the PRISMA method, the geographical coverage of the research is wide, involving multiple countries and regions, mainly concentrated in Asia, the Middle East, Europe, and North America (Figure 2). A total of 6 studies were conducted in India, which is the country with the largest number of studies in this review (Deshpande et al., 2024; Ghosh & Patra, 2024; Shah & Khanna, 2024a; Lexman et al., 2024; Deshmukh & Mehta, 2024). The predominance of Indian research could be explained by the huge size of online education in the country, large number of academics being proficient in English and great emphasis on IT and professional skill certification. A total of 4 studies were conducted in China, focusing on the application of learning management systems (LMS) and digital education transformation (Cheng, 2024a; Cheng, 2024b; C. Wang, 2024; Y. Wang, 2023). Three studies were conducted in Malaysia, focusing on learner behaviour and technology support in e-learning platforms (Sokro, 2024; Tee, 2024; Mohamad et al., 2024). One study was conducted in Saudi Arabia, exploring the impact of cultural factors on the adoption of learning technologies (Al-Mamary et al., 2023). One study was conducted in the Philippines, focusing on the experience of using e-learning platforms in developing countries (Himang et al., 2023). One study was conducted in Somalia, analysing learner engagement in the context of scarce local technology resources (Kineber et al., 2024). One study was conducted in Pakistan, studying the relationship between the adoption of e-learning technology and sociocultural support (Miao et al., 2024).One study was conducted in each of the following countries, focusing on different aspects of e-learning: Canada (Cocosila, 2024), Ghana (Sokro, 2024), Romania (Sitar-Tăut et al., 2024), Europe (Sobodić et al., 2024), Thailand (Puriwat and Tripopsakul, 2021), and Malta (Fiorini et al., 2022).

It can be observed that the research is concentrated between 2021 and 2024 (Figure 3), especially in the post-epidemic period (2023-2024), when the relevant research has increased significantly. One study was published in 2021 (Puriwat and Tripopsakul, 2021). One study was published in 2022 (Fiorini et al., 2022). Three studies were published in 2023, the year with the most studies (Himang et al., 2023; Wang, 2023; Al-Mamary et al., 2023). Seventeen studies were published in 2024 (Kineber et al., 2024; Sobodić et al., 2024; Ghosh & Patra, 2024; C. Wang, 2024; Sitar-Tăut et al., 2024; Sokro, 2024; Cocosila, 2024; Lexman et al., 2024; Mohamad et al., 2024; Deshpande

et al., 2024; Shah & Khanna, 2024a; Shah et al., 2024b; Miao et al., 2024; Tee, 2024; Cheng, 2024a; Cheng, 2024b; Deshmukh & Mehta, 2024). Most studies focus on a single country context, analysing the unique impact of culture, economy, and technology on e-learning. India focuses on improving professional skills through MOOCs (massive open online courses) and micro-certification technology. China explores the role of media richness and interactivity in promoting learners' continuous learning behaviour. Malaysia studies the application of learning management systems based on the UTAUT model (Unified Theory of Technology Adoption Model).

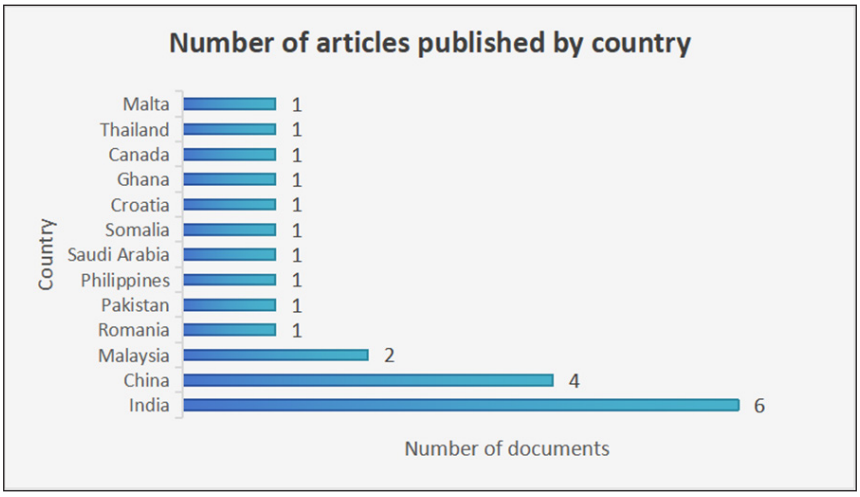

Figure 2. Countries where the studies were conducted

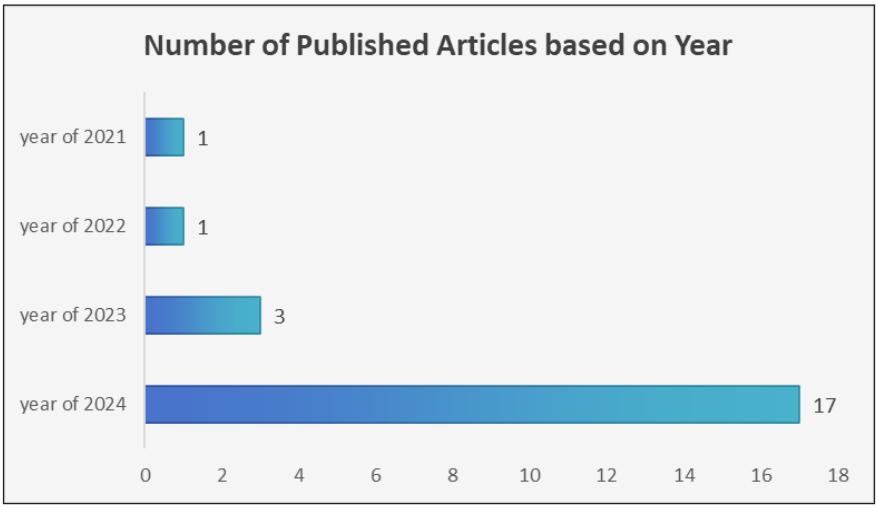

Figure 3. Year of publication

Some studies attempt to make regional comparisons. Sobodić et al. (2024) studies usability factors in the field of digital skill acquisition.

In addition, the research subjects include higher education students, working professionals, and mixed sample groups (Table 1). The research time range is concentrated from 2021 to 2024, and the regions involved include China, India, Malaysia, Saudi Arabia, Canada, and other countries, reflecting the global attention to the use of online learning platforms and user behaviour patterns. These studies analyse different user groups, some focus on specific groups (such as students or professionals), and some analyse cross-group behaviour patterns through mixed samples.

Main Finding and Synthesis

Based on the results of previous studies, this study identified four themes and twelve sub-themes, which are summarised in Tables 2, 3, and 4. Rather than merely describing individual study findings, a synthesis reveals several key patterns and comparisons. The study found that the continuance intention of users is affected by a combination of factors, among which perceived usefulness and motivation play a role. Especially after the epidemic, the critical advantages of online learning (course evaluation, emotional support) have significantly increased the user's dependence on the e-learning platform. Specifically, the quality of course design, content flexibility, and system quality have a significant impact on the user's learning experience, which in turn affects the user's participation. The study found that a high-quality learning experience can significantly improve the user's persistence. For students pursuing vocational qualification examinations, if the platform's course content is more closely integrated with the actual examination requirements and provides a systematic learning path, this directly addresses their primary goal of certification and significantly improves perceived usefulness and learning efficiency. This distinguishes the professional certification context from general e-learning, where the link to a high-stakes exam is less pronounced.

In addition, high levels of interactivity (including human-computer interaction and interpersonal interaction) significantly enhance users' emotions, cognition, and social participation. Learning groups and tutors' online Q&A functions can significantly improve the accuracy of their learning. Through timely feedback and communication, communities and users can feel a higher degree of learning participation, which in turn further increases their intention to continue using. At the same time, the role of users' technical adaptability and positive emotions in online learning cannot be ignored. These factors shape a more stable behavioural foundation in the learning process.

The learning behaviour of vocational qualification students is highly goal-oriented, and they generally face significant time pressure and exam preparation pressure. This pressure directly shapes their demand for and use of online learning platforms.

Table 1
E-learning users and country

Authors	E-learning users	Country
Sitar-Tăut et al. (2024) Y. Wang et al. (2024) Shah & Khanna (2024a) Shah et al. (2024b) Miao et al. (2024) Ghosh & Patra (2024) Al-Mamary et al. (2023) Cocosila, et al. (2024) Puriwat & Tripopsakul (2021)	Higher education students	Romania, China, India, Pakistan, Saudi Arabia, Canada, Thailand
Deshpande et al. (2024) Sobodić et al. (2024) Y. Cheng (2024a) Kineber et al. (2024) Deshmukh & Mehta (2024) Himang et al. (2023)	Working professionals	India, Croatia, China, Somalia, India, Philippines
C. Wang (2024) Y. Cheng (2024b) Tee, et al. (2024) Sokro et al. (2023) Lexman et al. (2024) Mohamad et al. (2024) Fiorini et al. (2022)	Mixed sample population	China, Malaysia, Ghana, India, Malta

Unlike students in general higher education, vocational qualification students have clear exam preparation tasks, and they are more inclined to choose platforms they perceive as capable of effectively improving learning efficiency to meet their exam needs and career development goals. In contrast, there is a positive feedback relationship between intrinsic motivation and exam preparation-driven learning pressure. Students' internal goals are clearer, and if the platform can effectively relieve learning pressure and improve exam preparation efficiency, it will further strengthen its internal driving force and encourage students to continue using it.

Cross-study Analysis

A meta-synthesis of the included studies provides some valuable insights and patterns. First, while perceived usefulness and satisfaction are universally important constructs, their antecedents and meanings differ between general student populations and working professionals seeking certification.

Table 2
Outcomes of included studies

Authors	Research approach	Data analysis	Findings
Sitar-Tăut et al. (2024)	A quantitative approach through the questionnaire as an instrument	The research involved a survey of 953 university students, employing structural equation modelling (SEM) to assess the relationships between variables and test the proposed hypotheses.	Online learning satisfaction significantly influences students' inclination towards online study and their dropout intentions. Factors such as technological adaptability, health safety, and social isolation shape students' experiences and attitudes in digital education during COVID-19.
Deshpande, et al. (2024)	A quantitative approach through the questionnaire as an instrument	Data from 220 working professionals were analysed using multiple regression analysis and analysis of variance (ANOVA)	The intention to continue pursuing e-learning courses is significantly influenced by three independent variables, namely, perceived usefulness (PU), motivation (MO), and satisfaction (SA). Among them, satisfaction is the most important thing for working professionals, followed by perceived usefulness and motivation.
Y. Wang et al. (2024)	A quantitative approach through the questionnaire as an instrument	The sample size was 270 valid samples, and partial least squares structural equation modelling (PLS-SEM) and importance-performance matrix analysis (IPMA) were used for calculation.	There is a positive relationship between expectation confirmation, perceived usefulness, flow experience, learning self-efficacy and MOOC satisfaction, while perceived usefulness, flow experience, learning self-efficacy and MOOC satisfaction also have a positive impact on continuance use intention.
Shah & Khanna (2024a)	A quantitative approach through the questionnaire as an instrument	1,350 samples were from millennial MOOC users, and partial least squares structural equation modelling (PLS-SEM) was used for data analysis	Satisfaction and continuance intentions in MOOCs are affected by performance expectations, effort expectations, social influence, and personal innovation.
C. Wang (2024)	A quantitative approach through the questionnaire as an instrument	The sample size was 1,350 participants, and confirmatory factor analysis (CFA) was used to assess the fit of the measurement model, and the analysis was based on the two-step method recommended by Anderson and Gerbing (1988).	Personalised learning environments and high learning satisfaction significantly improve the effectiveness of e-learning on platforms like Moodle, compared to traditional methods.

Table 2 (*continued*)

Authors	Research approach	Data analysis	Findings
Sobodić et al. (2024)	A quantitative approach through the questionnaire as an instrument	The sample size was 353 primary and secondary school teachers from six European countries, and the data analysis used structural equation modelling (SEM) to test the fit of the model and the hypothesised relationships.	Teacher satisfaction and perceived usefulness directly influence the ongoing use of the CRISS platform, with no moderating effects from computer skill level or usage time.
Shah et al. (2024b)	The quantitative research used an online questionnaire survey method.	The sample size was 389 students, and structural equation modelling (SEM) was used for data analysis. Smart PLS 3 software was used to evaluate the measurement model and structural model.	The UTAUT2 model factors like performance expectations and facilitating conditions have a significant positive impact on the learning experience and the intention to continue using, with the sample demographics matching the representative sample.
Cheng (2024a)	Quantitative research, using structural equation model (SEM) for data analysis	A total of 393 questionnaires were analysed using AMOS 5.0 and SPSS 8.0 for structural equation modelling, including confirmatory factor analysis.	Perceived network externalities, personalisation, and sociability in MOOCs positively influence cognitive, psychological, and social learning engagement, enhancing learning persistence.
Tee et al. (2024)	Quantitative research design, using a self-reported questionnaire survey method	A total of 354 valid questionnaires were analysed using AMOS statistical software and SPSS PROCESS macros.	Course design factors such as flexibility, system quality, and content quality significantly impact the learning experience, which mediates learner engagement and influences willingness to pay more, with pleasure during learning strengthening this effect.
Sokro et al. (2023)	Quantitative research design, using a self-reported questionnaire created using Google Forms.	Data from 540 completed responses were processed using the partial least squares structural equation modelling (PLS-SEM) technique with SmartPLS software.	System quality significantly enhances learner success, and learner satisfaction positively affects learner attitudes.
Kineber et al. (2024)	A combination of qualitative and quantitative methods, using the survey method and literature review,	Out of 148 collected student responses, 128 were analysed using partial least squares structural equation modelling (PLS-SEM) and artificial neural network (ANN) methods.	Factors like course design quality, instructor reputation, and student support significantly influence students' continuance intention and satisfaction in MOOCs.

Table 2 (*continued*)

Authors	Research approach	Data analysis	Findings
Ghosh and Patra (2024)	The study adopted a quantitative research method, combining statistical tests and text mining methods.	The sample of 622 Indian college students was analysed using IBM AMOS 23.0 for covariance-based structural equation modelling (CB-SEM) and bootstrapping for moderation analysis.	Online learning benefits, health considerations, and course assessments significantly affect students' intentions to pursue online education, with positive emotions and trust observed in sentiment analyses.
Lexman et al. (2024)	A combination of qualitative and quantitative.	Partial least squares structural equation modelling (PLS-SEM) was used to analyse 212 samples.	Intrinsic motivation positively correlates with behavioural intention, while extrinsic motivation has a limited impact, and gender differences significantly affect perceptions of self-development and usefulness.
Cheng (2024b)	A quantitative approach through the questionnaire as an instrument	The sample size of 309 was analysed using AMOS 5.0 and SPSS 8.0, employing confirmatory factor analysis and structural equation modelling techniques.	Media richness, human-computer interaction, and human-human interaction positively impact emotional, cognitive, and social learning engagement in MOOCs for medical professionals, contributing to their learning persistence.
Miao et al. (2024)	A quantitative research method was adopted to collect data through a questionnaire survey.	The data were collected from university students in Karachi through convenience sampling methods, and the PLS-SEM technique was used to analyse the data.	Autonomous motivation (AM), perceived usefulness (PUn) and perceived learning (PL) have significant positive effects on attitude towards using technology (AT), and attitude (AT) has a significant positive impact on behavioural intention (BI), but controlled motivation (CM) and perceived challenge (PC) have no significant relationship with AT, and labor market conditions (LMC) fail to moderate the relationship between AT and BI.
Al-Mamary et al. (2023)	A quantitative approach through the questionnaire as an instrument	The study used 445 undergraduates as a sample for a questionnaire survey. The specific calculation method includes structural equation modelling	The study found that effort expectancy (EE), social influence (SN), attitude toward behaviour (ATB), and perceived behavioural control (PBC) were significantly positively correlated with students' intentions to use learning management systems (LMS). In addition, there was a strong relationship between students' intention to use LMS and actual use.

Table 2 (*continued*)

Authors	Research approach	Data analysis	Findings
Deshmukh and Mehta (2024)	Quantitative research method, using a purposive sampling technique.	The sample size was 386 responses from Indian IT professionals, and the structural equation model (SEM) analysis was conducted using SPSS-AMOS tool.	The study found that performance expectancy (PE), effort expectancy (EE), perceived benefit (PB) and management support (MS) had a strong positive impact on online learning continuation intention (OLCI), while social influence (SI) had no significant effect on OLCI.
Cocosila, et al. (2024)	The study used a cross-sectional online survey method.	Collected data from 247 Canadian students and used partial least squares structural equation modelling (PLS-SEM) for data analysis.	Students' usefulness of online learning, perceived monetary benefits relative to costs, and positive online learning habits, combined with positive expectation confirmation, satisfaction, and positive attitudes, significantly influenced their intention to continue online learning.
Himang et al. (2023)	Qualitative research, using the Deterministic Decision Making Experiment and Evaluation Laboratory (DEMATEL) method.	The Fuzzy Decision Experimentation and Evaluation Laboratory (DEMATEL) method was used, and the researchers also used fuzzy set theory to deal with uncertainty in expert opinions.	Technology pedagogical knowledge of self-efficacy (TPK-SE), intrinsic motivation (IM), and extrinsic motivation (EM) had significant effects on the intention to continue using digital educational technologies. Technostress (TS) and burnout (BO) were the effects of other causal constructs.
Mohamad et al. (2024)	A combination of qualitative and quantitative. The study adopted a cross-sectional method and collected data through a questionnaire survey.	The sample size was 121 users. The data analysis methods included structural equation modelling (SEM), including analysis of measurement models and structural models, and mediation analysis.	Perceived usefulness, expected effort, social influence, facilitating conditions, and trust were identified as key antecedents before and after the adoption of PADLET as an e-learning tool. The study also confirmed the partial mediating effect of user satisfaction between confirmation and continuance intention.
Puriwat and Tripopsakul (2021)	A quantitative approach through the questionnaire as an instrument	185 valid questionnaires were used for data analysis. The study used structural equation modelling (SEM) to analyse the data and was conducted through AMOS 20.0 software.	E-learning quality (ELQ), composed of course content and design (CCD), instructor and learner characteristics (ILC), and administrative and technical support (ATS), has a significant positive impact on Thai higher education students' satisfaction and continuance intention during the COVID-19 pandemic, and student satisfaction partially mediates the relationship between the two.
Fiorini, et al. (2022)	A combination of qualitative and quantitative. Data was collected through a questionnaire survey.	The research subjects were "part-time adult undergraduates". The Mann-Whitney U test was used to analyse the association between different factors and online learning satisfaction.	Adult part-time students generally have a positive attitude towards online lectures, adapt quickly, and hope to continue after the epidemic. Women benefit more because they need to balance work and family.

For the latter, "usefulness" is strongly correlated with tangible outcomes such as job advancement and certification success, a connection that is less prevalent in reviews of general education. This review's focus allows us to highlight that it is this instrumental, career-oriented utility that is uniquely critical.

Second, there are clear regional patterns in the literature. Research in Asian countries, especially India, primarily focuses on utilitarian aspects like performance expectancy and facilitating conditions, often through the lens of the UTAUT model. This likely reflects a particular regional emphasis on scalable, cost-effective solutions for skill certification in competitive job markets. By contrast, the European study (Sobodić et al., 2024) incorporates concerns such as usability and teacher-specific satisfaction, perhaps reflecting different institutional or cultural emphases on pedagogical quality.

Third, the depth and focus of theoretical integration differ among the studies. Studies drawn on the ECM emphasise the satisfaction-confirmation loop particularly strongly, while those using UTAUT2 incorporate a wider array of predictors, including hedonic motivation.

Fourth, the predominance of research in Asia suggests that these findings on continuance intention may be particularly

Table 3
Themes and sub-themes of the findings

Theme	Sub-theme	Authors
Technical factors	System availability, platform functionality, and technical support	Al-Mamary et al. (2023) Mohamad et al. (2024) Sobodić et al. (2024) Cocosila et al. (2024) Shah et al. (2024) Cheng (2024a) Puriwat and Tripopsakul (2021)
User Features	User motivation, technology familiarity, and educational background	Kineber et al. (2024) Sokro et al. (2023) Lexman et al. (2024) Fiorini, et al. (2022) Sitar-Tăut et al. (2024)
Content and course design	Content quality, interactivity, customised learning	Tee et al. (2024) Y. Wang et al. (2024) C. Wang (2024) Shah and Monica (2023) Cheng (2024b)
Social influences and environmental factors	Social influence, Learning community, Environmental factors	Miao et al. (2024) Deshmukh and Mehta (2024) Ghosh and Patra (2024) Sokro et al. (2023) Cocosila, et al. (2024)

Table 4
Themes and sub-themes of the findings

Authors	Technical factors			User features			Course design		Social and environmental factors		
	SA	PF	TS	UM	TF	EB	CQ	IN	CL	SI	LC	EF
Sitar-Tăut, et al. (2024)			√		√							
Deshpande et al. (2024)		√										
Y. Wang, et al. (2024)							√				√	
Shah & Khanna (2024a)				√						√		
C. Wang (2024)	√		√		√			√				
Sobodić et al.(2024)		√								√		
Shah, et al. (2024b)					√	√			√			
Cheng (2024a)				√				√	√			
Tee et al. (2024)	√		√				√					
Sokro et al. (2023)				√		√					√	
Kineber et al.(2024)					√							√
Ghosh & Patra (2024)	√							√			√	
Lexman et al. (2024)		√		√			√		√			
Cheng (2024b)	√						√					
Miao et al. (2024)			√		√	√				√		
Al-Mamary et al. (2023)		√	√						√			
Deshmukh & Mehta (2024)				√						√		√
Cocosila et al. (2024)	√		√									√
Himang et al. (2023)				√		√						
Mohamad, et al.(2024)		√						√	√			
Puriwat & Tripopsakul (2021)	√											

Note. Technical factors and user features

SA = System Availability; UM = User Motivation; PF = Platform Functionality; TF = Technology Familiarity; TS = Technical Support; EB = Educational Background

shaped by specific cultural and economic contexts, such as the pronounced emphasis on formal certifications and competitive job markets, and their immediate generalisability to other global regions is not assured.

DISCUSSION

In 22 relevant papers, various factors were studied to determine how they affect the continuance intention of e-learning users, as this is the main goal of this study. Therefore, among the 22 selected articles, 17 adopted quantitative methods, 4 mixed methods, and 1 adopted qualitative methods. In the final selected articles, as shown in Figure 4, to effectively analyse these influencing factors and construct a systematic framework, the researchers divided the factors into four main themes: technical factors, user features, course content design, social influences, and environmental factors. These four themes provide a multi-dimensional theoretical framework for understanding the continuance intention of e-learning.

Technical Factors

One of the major themes is technical factors, which encompass several parameters, including platform performance, technical features, and user experience, and significantly affect the continuance intention of e-learning. According to research, users will continue using the platform based on their perceived usefulness of the platform. The effect of continuing to use the platform will be much more significant if the platform is perceived to be helpful. Pham et al. (2019) and Cocosila et al. (2024) indicate that perceived usefulness is more than just the relevance of learning content but also relates to the platform's capacity to facilitate learners' career advancement.

Research shows that individual users' perceptions of the platform's usefulness are decisive for future use. If the usefulness of the platform is perceived to be high, it has a strong tendency to continue. Shi Hui et al. (2021) and Mihail Cocosila et al. (2024) argued that perceived usefulness involves the relevance of the learning content and is associated with the platform's role in enhancing learners' career development. Deshmukh and Mehta (2024) perceived usefulness as having a significant impact on the continued intention to use online learning (2024). This means that if learners think that online learning benefits them in a practical sense, malfunctioning in terms of outcomes due to learning and career growth, they are more likely to keep to these platform providers. Related to this, Cheng (2024b), and Shah & Khanna (2024a) further emphasised that learners think that online learning will contribute to learning outcomes and facilitate career development. This understanding further increases their intention to continue using it.

In the professional certification context, this perceived usefulness is uniquely tied to exam success. The platform is not just a source of knowledge, but a tool for achieving a specific, high-stakes goal. Features that directly support exam preparation, such as practice tests, performance analytics, and content aligned with certification blueprints, are therefore not merely nice-to-have additions but core drivers of continuance intention.

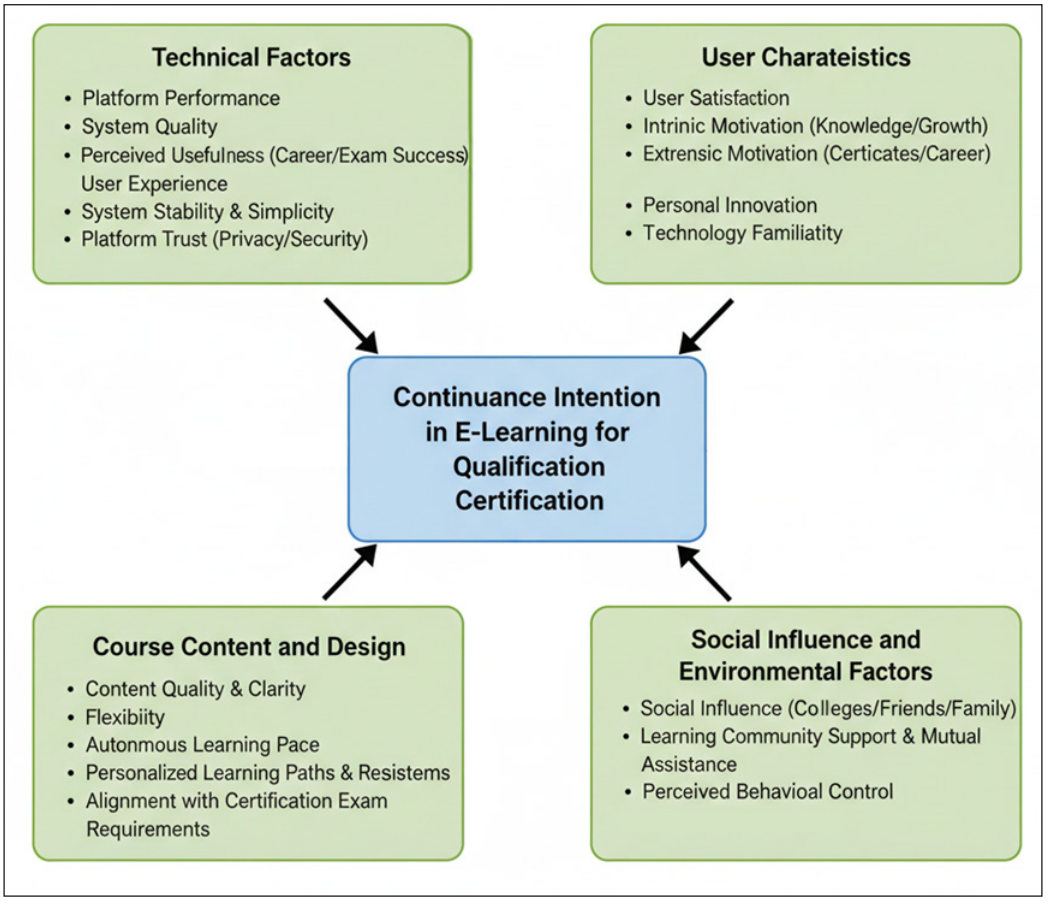

Figure 4. A systematic framework of factors influencing continuance intention

Apart from that, system quality, such as the platform's stability, simplicity, and the availability of technical support, also significantly affects the user experience. Moreover, Platform trust is also a central component of the technical factor. Users, most likely, will stick to platforms they have trusted for many years, particularly in terms of trusting their privacy protection and data security. As Cheng (2023) found, when the platform is perceived as a trustworthy entity that can secure learners' data, they are more likely to continue using that platform. Compatible technical designs can also more accurately deliver user needs, which helps enhance the learning experience. Sitar-Tăut et al. (2024) highlighted the strong association between learners' technology adaptability and online learning satisfaction. Then, if the platform can directly align with what learners need in terms of how it is technically designed, learners' satisfaction and intention to use it will also increase.

User Characteristics

Another area of interest is user characteristics, which examine how the personal traits of learners and their intrinsic motivation influence their continued use of intention. The core driver of user retention is user satisfaction. The longer students are happy with their overall learning experience on the platform, the more time they spend on the platform. User satisfaction in online learning for professional qualification certificates is closely related to learners' learning outcomes, which further affects learners' continued intention to use online learning platforms. Deshpande et al. (2024) found that the satisfaction of working professionals with online learning platforms was a leading factor in the decision to continue using the platform. This satisfaction is the result of the entire user experience in the platform, the quality of the learning resources, the effectiveness of the technical support, interactive design, and the accomplishment of academic and professional goals. Similarly, Sobodić et al. (2024) reported front-line teachers decide whether to provide long-term use of the platform based on whether they are satisfied with the platform or not, and content practicality, convenience of teaching tools, attitude toward training and technical support, and other factors affect it. Moreover, it has been accounted that the quality of e-learning greatly affected the students' satisfaction and the ongoing intention to benefit from the local educational establishments during the COVID-19 epidemic (Puriwat & Tripopsakul, 2021). However, the impact of realisation in MOOCs (massive open online courses) based on students' satisfaction and the intention to continue to use the course is one such research finding by Ahmed (2024). Overall, higher satisfaction suggests that learners value the platform's utility for learning and feel like the platform can help them reach learning outcomes. Such positive emotion helps reduce dropout risk effectively, thus, in turn, deepening learners' intention to continue using it on a longer horizon.

The intrinsic ones include interest in knowledge and desire for personal growth, and the extrinsic ones include obtaining certificates and getting career development opportunities, and both are key to influencing learners' behaviour decisions. According to Jinal Shah and Monica (2023), student motivation and encouragement of continuance learning intention can be improved by factors including personal innovation and social influence. Furthermore, Lexman et al. (2024), and Cigdem et al. (2024) also emphasise that the motivation of students includes both external incentives and personal interest, which makes a case for students' continual learning behaviour. The heterogeneity of user attributes renders this dimension crucially influential on the use of continuance intention.

Course Content Design

Several researchers point out that the design of course content is a significant factor contributing to the intention to keep using

e-learning. Good course design can greatly enhance learners' sense of participation, learning effects, and overall evaluation of the platform. The researchers Tee et al. (2023) suggested that clarity and structure of course content are important for enhancing students' learning intentions and helping learners to fully experience the effectiveness of the learning content.

For professional certification, content design must go beyond general interest. It must be perceived as directly relevant to the certification exam. Flexibility and system quality were found to be of notable importance in course design; the study further indicated. Kineber et al. (2024) and Poh Kiong Tee et al. (2024) indicated that modular course configuration, autonomous learning pace, and good system functions, like smooth operation, stable operation, and user-friendly interface, all greatly improve the learning experience. When learners can freely schedule their study time according to their own needs and get a wide variety of rich learning resources based on the platform, they are more likely to use the platform for a long time.

Moreover, the design of high-quality courses should be scientific and systematic — practical; it should provide learners with a clear learning path, facilitating effective knowledge transfer. Moreover, in course design, personalised learning experience is one necessary consideration that will not be abandoned. Personalised learning environment (such as customised learning path, personalised recommendation system, etc.) has shown that it has a profound effect on improving learners' satisfaction and learning efficiency (C. Wang, 2024)

Social Influence and Environmental Factors

Shah and Khanna (2024a) found that social influence (such as the positive attitude of colleagues, friends and family towards e-learning) and learners' innovative ability significantly enhance learning willingness. Social influence, especially the views of family, peers, or colleagues, will affect individuals' online learning decisions and intentions. Cigdem et al. (2024) and Mohamad et al. (2024) showed that there is a significant positive relationship between social influence and learners' intention to adopt online learning tools. Deshmukh and Mehta (2024) further pointed out that although social influence has a smaller impact on the continuance learning intention of some professional workers, it is still a factor that cannot be ignored.

Especially after the COVID-19 pandemic, the impact of social influence on students with professional certificates is more significant. During the epidemic, distance learning became the main way for many students to obtain professional certificates. When students choose online learning platforms, they are more influenced by the opinions and suggestions of their families, colleagues, or friends. The support of social networks, especially the mutual assistance and shared learning experience provided during the epidemic, significantly enhanced students' learning motivation and participation.

Cigdem et al. (2024) further showed that when learners feel that the surrounding environment supports their learning behaviour, their learning motivation will be significantly improved. In addition, learners' sense of behavioural control also has an important impact on continuance of learning intention. If learners believe that the threshold for using the platform is low (for example, easy-to-use interface, rich tutorials, and technical support), their learning intention and participation will be significantly enhanced. For professional learners, they often balance work and study, and an environment that provides both social encouragement and the practical means to engage with the platform is critical for sustained use.

CONCLUSION

This systematic review screened relevant literature from the Web of Science (WoS), Scopus, Emerald, and ScienceDirect databases based on the PRISMA 2020 method to ensure the relevance of the selected articles and summarise them. The findings were narratively synthesised to form the four major themes and twelve sub-themes. Most of the studies in the selected articles used empirical data analysis techniques, primarily partial least squares structural equation modelling (PLS-SEM), to verify the variables. In addition, a qualitative study that supports the overall findings of this review was included. In summary, this study extracted four major themes and twelve sub-themes from the presented research results, which best represent the key variables discussed in the selected literature. By focusing on the under-reviewed context of professional qualification certification, this review offers novel insights into how exam pressure and career utility shape continuance intention, distinguishing it from reviews of general e-learning.

First, the themes and sub-themes highlighted in this review provide important practical recommendations for promoting users' continuance of use intention in the field of professional qualification certification. These recommendations can be used as a reference for educational technology platforms and relevant stakeholders to help them identify key factors that have a significant impact on user behaviour and platform use intention, thereby optimising platform functions and services. Specifically, platform developers should prioritise the technical factors (system stability) and course design factors (exam-aligned content) identified as crucial for professional learners. Second, relevant organisations can benefit from the findings of this study and take specific measures to improve user experience, enhance user satisfaction, and user intention by targeting the factors identified in the themes, thereby promoting the long-term development of the overall platform. Third, the research findings in this review are of great significance in the current rapidly changing and uncertain market environment. The themes and sub-themes proposed in the study provide management insights for platform managers in the field of professional qualification

certification to deal with uncertainty and complex environments.

Fourth, in terms of academic contribution, this study lays a theoretical foundation for future researchers who wish to explore user continuance use intention in the field of professional qualification certification. Future researchers can conduct in-depth research based on the themes and sub-themes discussed in this review and previous literature. An important research gap found in the process of this systematic review is "brand trust and user loyalty management based on e-learning platforms", which is rarely mentioned in previous literature. Future research should empirically investigate how specific platform attributes (e.g., certification authority partnerships, success rate transparency, and alumni networks) build brand trust and foster loyalty among professional learners. It is hoped that more research will focus on this area in the future to further explore its important impact on user continuance use intention.

Fifth, it is recommended that future researchers conduct more exploratory and quantitative research to identify more variables that affect user continuance use intention, so as to promote the further development of professional qualification certification e-learning platforms. Specifically, we suggest: (1) Longitudinal studies to track how continuance intention evolves through the certification journey; (2) Experimental research on the impact of AI-driven personalisation and adaptive learning systems on professional learners' engagement; (3) Investigations into the role of gamification elements in sustaining motivation for exam preparation; and (4) Comparative studies across different cultural and regional contexts (e.g., Europe, North America, Africa) to test the generalisability of the factors identified in this Asia-centric review. In addition, this study also found some limitations. First, this review focuses only on published articles in well-known databases such as Web of Science (WoS), Scopus, Emerald, and ScienceDirect, so there may be selection bias, and some studies that are not published or not included in high-impact journals may be excluded. Second, the articles selected in this study mainly cover articles in Asia, and the research samples in these regions may not be sufficient to represent the global perspective. Therefore, it is recommended that more relevant studies centred on the United States or other regional perspectives be conducted in the future. Overall, the limitations revealed by this study provide a clear direction for future research in the field of professional qualification certification.

Limitations and Recommendations for Future Research

Despite its contributions, this study has several limitations that future researchers should consider. First, the review relies exclusively on peer-reviewed articles from selected databases such as Web of Science, Scopus, Emerald, and ScienceDirect. This creates a potential selection bias, as it excludes grey literature, non-English publications, and articles not indexed in high-

impact journals, potentially overlooking diverse insights. Furthermore, the review's methodology was limited to thematic synthesis. It did not include a quantitative meta-analysis or formal weighting of evidence of quality, which could have provided a different level of insight into the relative strength of the identified factors. Second, the geographic focus of the selected articles is predominantly on Asian regions, which may limit the generalisability of the findings to a global context. Hence, future studies should broaden the geographic scope to include research from Western countries, Africa, and Latin America, to offer more comprehensive cross-cultural perspectives

Furthermore, an evident research gap lies in brand trust and user loyalty management in e-learning environments—an aspect that has received minimal attention in the existing literature. Future research should explore this dimension in depth to understand how trust-building mechanisms and loyalty programmes influence user continuance intention. Additionally, it is recommended that researchers employ a combination of exploratory, quantitative, and longitudinal methods to discover new influencing variables and to verify the dynamic nature of user behaviour over time. Investigating the impact of emerging technologies like AI-powered personalisation, adaptive learning paths, and gamification on the continuance intention of professional certification seekers represents a crucial future direction. Investigating platform-specific features, personalisation algorithms, and gamification effects could also enrich our understanding of how to sustain user engagement in professional certification contexts.

By addressing these limitations and exploring under-researched areas, future studies can contribute to the refinement and advancement of e-learning platforms for professional qualification certification in an increasingly digital and globalised educational environment.

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