

Review Article

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A Systematic Literature Review of Barriers Affecting e-Learning in Higher Education

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Abstract

Background/purpose. In a global context marked by accelerating digital transformation, higher education institutions are encountering significant challenges in integrating online learning tools. Although educational technologies are increasingly recognized as catalysts for pedagogical innovation, their effective adoption remains constrained by systemic barriers. The objective of this study is to identify, categorize, and analyze these obstacles through a systematic review of scientific literature.

Materials/methods. The approach adopted is based on the PRISMA protocol, which guarantees the rigor and transparency of the selection process. Seventy-seven scientific publications were selected, all of which were peer-reviewed and published between 2015 and 2024, from four reference databases: Scopus, Web of Science, ScienceDirect, and Google Scholar. The analysis was based on both quantitative and qualitative approaches, using tools such as NVivo and Excel for thematic coding.

Results. The analysis reveals the importance of three broad categories of cross-cutting obstacles: technological barriers (lack of infrastructure, low connectivity), institutional barriers (lack of administrative support, inadequate educational policies), and psychological barriers (resistance to change, low digital self-efficacy).

Conclusion. In light of these conclusions, the study recommends a set of convergent measures: strengthening digital infrastructure, deploying continuing education programs for teachers, and implementing institutional policies that promote the adoption of technologies.

1. Introduction

Online learning has become a recognized component of contemporary higher education thanks to its well-documented advantages, including temporal flexibility, geographical accessibility, personalization of learning paths, and diversification of educational resources (Duggal, 2022; Kibuku et al., 2020; Ortiz Beltrán et al., 2023; Díaz-García et al., 2023). The advent of digital technologies has led to a significant increase in self-directed learning opportunities, while also enabling the management of distance learning systems (Zhu et al., 2022).

However, despite this favorable dynamic, the integration of online learning continues to be hampered by several persistent obstacles, especially in countries in the Global South (Ahmed, 2013; Njenga, 2024; Ray, 2022). E-learning refers to the use of digital technologies, particularly internet-based platforms, to deliver, support, and manage learning activities. It facilitates both synchronous and asynchronous interactions and enables learners to access educational content flexibly and independently (Al-Fraihat et al., 2020; Gamage et al., 2022).

This phenomenon goes beyond the simple sphere of technical challenges. It is often linked to a multifaceted interaction of psychological, institutional, and cultural elements that shape the perception of educational innovation among the parties involved (Heidenreich & Kraemer, 2016; Joachim et al., 2018).

The introduction of digital technologies into teaching methods can give rise to certain forms of resistance, often linked to a lack of institutional support or fears of a dehumanization of the educational relationship (Salawu et al., 2019; Chukhray et al., 2022; Lennon & Maurer, 2020).

In this context, the present systematic review, based on an analysis of 77 scientific articles published between 2015 and 2024, aims to identify the major barriers to the adoption of e-learning in higher education. The following research questions guide this study:

1. What are the main barriers hindering the adoption of e-learning in higher education?
2. How do these barriers vary across geographical and institutional contexts?
3. What theoretical and methodological approaches are used to study these barriers?
4. What solutions and recommendations are proposed in the literature to overcome these barriers?

The article is organized into six sections: after presenting the methodology, the next section presents the main empirical results, followed by an analytical discussion linking theoretical contributions and managerial implications. Finally, the last sections specify the limitations of the study and prospects for future research.

2. Methodology

A systematic literature search was carried out, with an approach based on established scientific recommendations (Gundolf & Filser, 2013; Kraus et al., 2014). The analysis was conducted in accordance with the three-step PRISMA framework (identification, selection, and inclusion), as illustrated in Figure 1. The inclusion and exclusion criteria are delineated in Table 1.

2.1. Research Strategy

A targeted search strategy was implemented, combining the terms "online learning," "e-learning," and "eLearning" with "resistance," "barrier," "obstacle," and "higher education" or "university" to identify the most relevant publications.

2.2. Inclusion and Exclusion Criteria

Table 1 presents a set of inclusion and exclusion criteria meticulously defined for the study.

Table 1. Inclusion and Exclusion Criteria

Inclusion criteria	Exclusion criteria
IC1: Type and period of publication ✓ Journal articles and peer-reviewed papers ✓ Published between 2015 and 2024	EC1: Publication period ✓ Published before January 2015
IC2: Subject and objective ✓ Studies on resistance to innovation and e-learning in higher education ✓ Exploring barriers to the adoption and use of e-learning	EC2: Studies topic ✓ Studies not concerned with resistance to innovation or e-learning in higher education.
IC3: Language and methodology ✓ Published in English or French ✓ Use of rigorous methodological frameworks	EC3: Language of publication ✓ Articles not written in English or French
IC4: Full text ✓ Full text available online	EC4: Full text ✓ Full text not available online

A systematic sorting of titles, abstracts, and full texts was carried out according to criteria defined in advance, ensuring the selection of the most relevant and rigorous studies. This multi-step process reinforced the validity of the review.

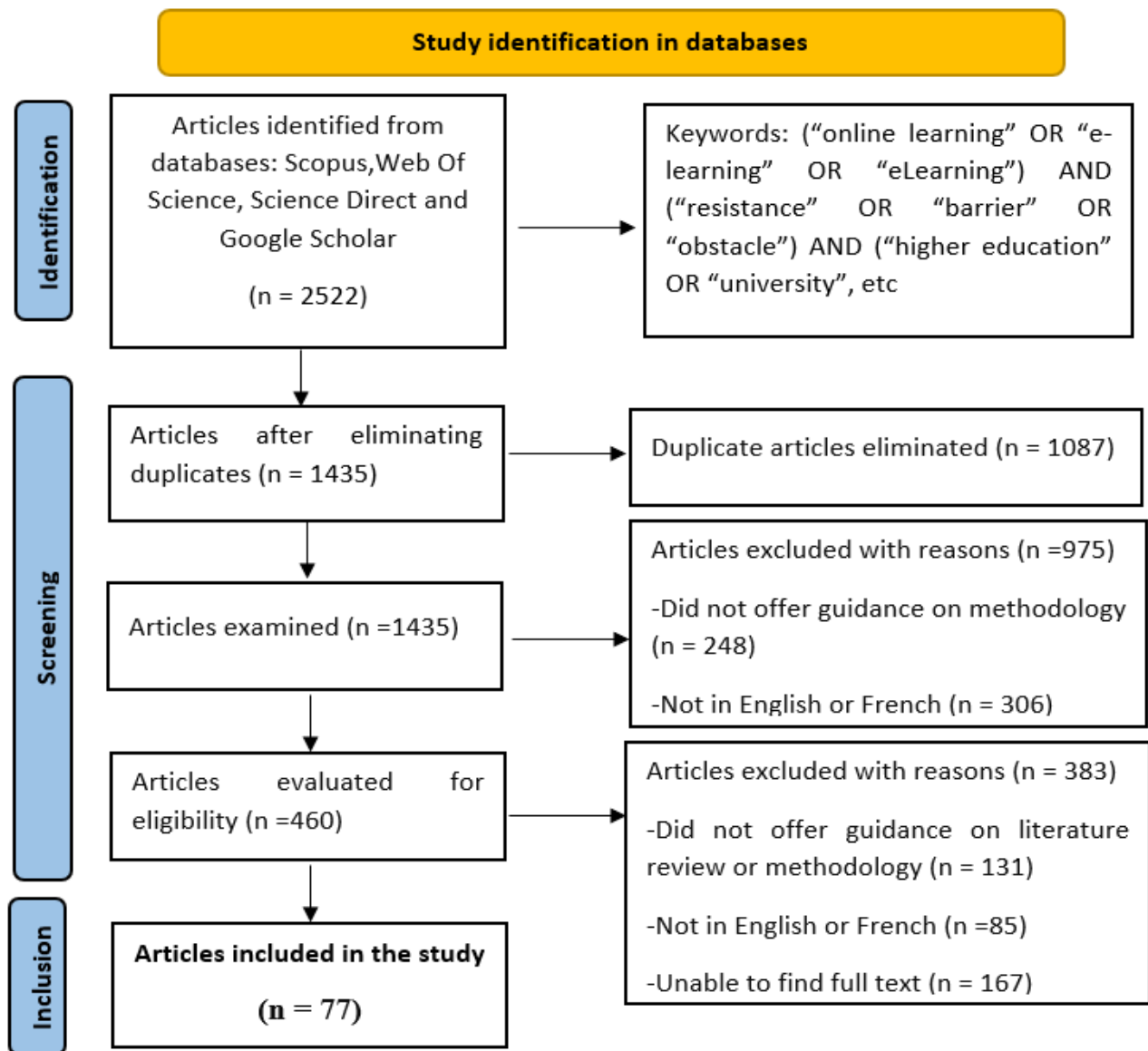


Figure 1: PRISMA Flowchart

2.3. Quality Assessment

The 77 studies selected were evaluated according to the University of West England framework (Moule et al., 2003), based on four criteria: clarity of objectives, methodological rigor, readability of results, and relevance of conclusions, on a scale of 0 to 2.

All met the required quality standards and were included in the final analysis (see Appendix A).

2.4. Data Analysis

Data extraction was performed using a standardized form and then managed via Zotero. A content analysis was conducted on the 77 articles using Excel and NVivo10, allowing the main themes to be identified.

3. Results

In this section, two types of analysis have been carried out: a descriptive analysis and a thematic content analysis.

3.1. Descriptive Analysis

3.1.1. Type and Language of Articles

Among the 77 articles analyzed, most are in English (74), with only 3 in French—highlighting the dominance of English in this field. Notable French contributions include Le Roux et al. (2015) on consumer resistance, Ait-Taleb and Mani (2020) on learner resistance to pedagogical innovation, and Berdi et al. (2020) on e-learning barriers during the COVID-19 crisis in Morocco. These studies enrich the review with valuable contextual perspectives.

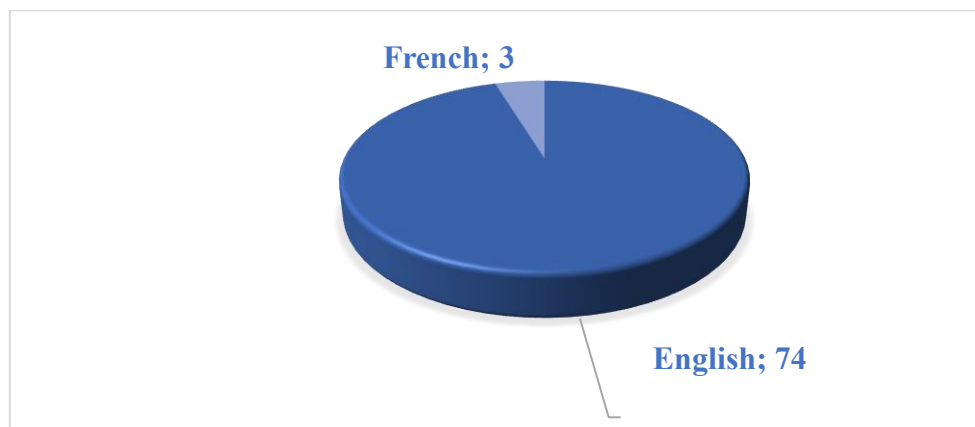


Figure 2. Papers Language

Figure 3 illustrates the distribution of article types examined in this systematic review. The majority of the studies included in this systematic review are empirical articles, comprising a total of 62 articles. Literature reviews and conference papers were followed by 5 articles, providing analyses and syntheses of existing research. Systematic reviews, providing additional theoretical and contextual perspectives, accounted for 4 papers, followed by one book chapter.

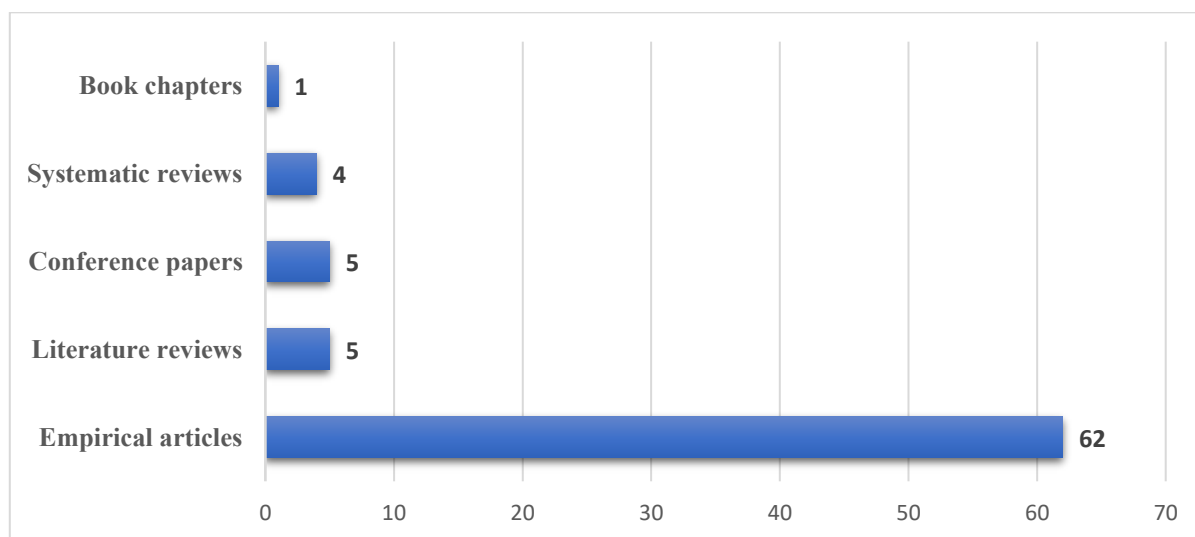


Figure 3. Papers Types

3.1.2. Year of Publication

The reviewed articles span from 2015 to 2024, with a marked increase in publications from 2019 onward. The peak in 2021 (19 articles) aligns with the COVID-19 crisis, which accelerated interest in e-learning solutions. This trend reflects growing academic concern with barriers to e-learning and the need for resilient systems. The corpus includes diverse article types, enriching the analysis with varied perspectives.

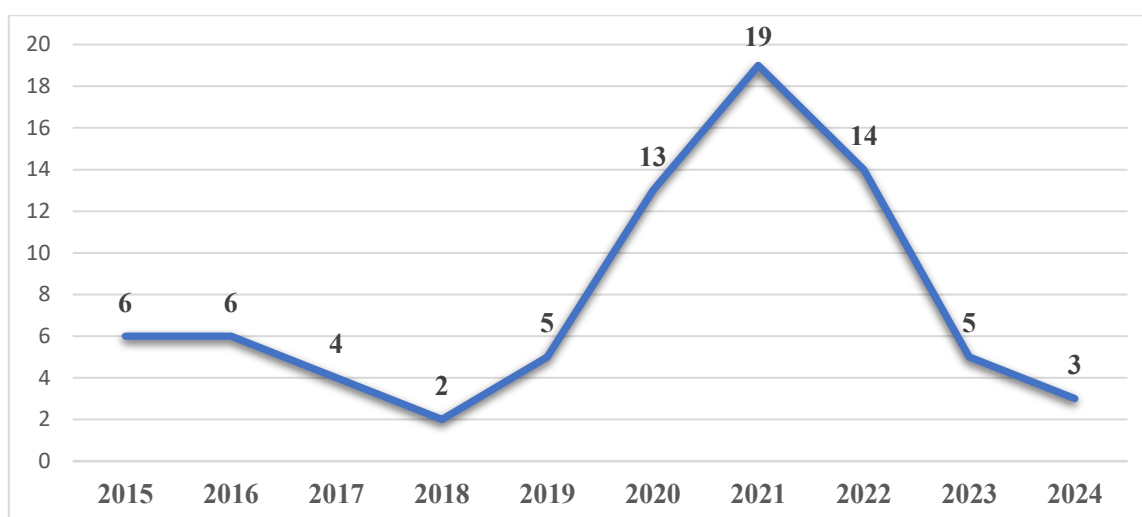


Figure 4. Papers Over Time (2015-2024)

3.1.3. Distribution of Articles by Country

Figure 5 presents a geographical overview of the publications, categorized by region and country of origin. The majority of the articles included in this study were sourced from Saudi Arabia (11), followed by India (6) and other significant contributions from the UK, Egypt, and China (5 each). There were also notable contributions from Germany and Morocco (4). Countries such as Gambia, Jordan, Spain, the United States, Pakistan and Finland are represented with 3 articles each, indicating a global interest in studies on e-learning and resistance to innovation. The involvement of African countries is also visible, with articles from Morocco, Ghana, and other regions. On the other hand, regions such as Oceania and Latin America seem to be less represented, suggesting opportunities for future research in these areas.

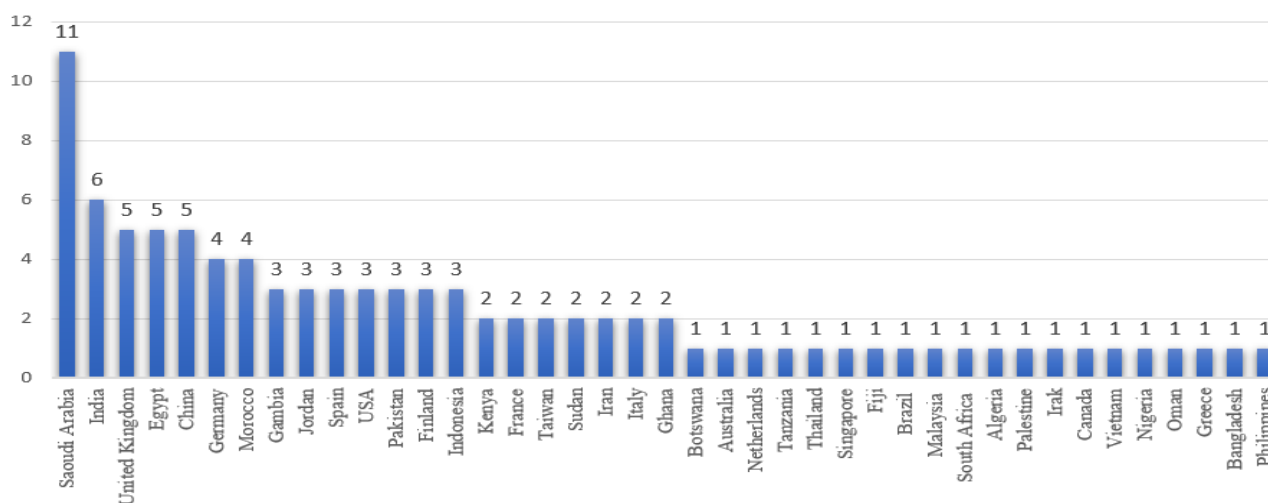


Figure 5. Distribution of Papers by Country

3.1.4. Publication Journals

The 77 articles were published in a wide range of journals, reflecting the interdisciplinary nature of research on e-learning and resistance to innovation. *Frontiers in Psychology* and *Education and Information Technologies* are the most represented (4 articles each), followed by *The Electronic Journal of e-Learning* and *IJEDICT* (3 articles each). Other journals, such as *BMC Medical Education* and *Journal of Business Research*, contribute two articles each. This diversity highlights the varied disciplinary approaches—psychology, ICT, management, and education—used to explore this complex issue.

3.1.5. Most Frequent Words

A content analysis using NVivo revealed that the most frequent terms were "learning," "resistance," "innovation," "technology," and "students," reflecting a strong focus on the integration of technology in education and the barriers encountered. The prominence of "resistance" and "innovation" highlights recurring concerns about the acceptance of new educational tools. Key themes emerging from the literature include technological innovation, adoption factors, and challenges related to e-learning integration, emphasizing the need to understand better resistance to improve the effectiveness of digital education.



Figure 6. The Word Cloud of Recurring Themes in the Articles Examined

3.2. Thematic Content Analysis

3.2.1. RQ1 – What are the Main Barriers to the Adoption of e-Learning in Higher Education?

Analysis of the 77 articles reveals six major categories of barriers: technological, institutional, psychological, functional, personal, and cultural. Functional and psychological barriers are particularly linked to low digital literacy, lack of confidence, and resistance to change (Muqtadiroh et al., 2019; Ma & Lee, 2019; Alshallaqi et al., 2022). Technological limitations, such as inadequate infrastructure, obsolete equipment, and lack of technical support, are particularly pronounced in low-resource settings (Bouyzem & Al Meriouh, 2020).

At the institutional level, the lack of clearly defined policies and structured administrative support hinders the integration of digital technology (Al Gamdi & Samarji, 2016). In addition, the preference for traditional teaching formats, combined with limited digital skills, reflects persistent cultural anchors (Joanne, 2020; Basir et al., 2021). These findings confirm the prevalence of structural barriers, particularly in Southern countries (Ray et al., 2022; Naveed et al., 2022), while other more latent forms of resistance are expressed in advance institutional contexts.

3.2.2. RQ2 – How do These Barriers Vary According to Geographical, Institutional, and Cultural Contexts?

Forms of resistance to e-learning vary significantly, according to national contexts. Among developed countries, the barriers are mainly psychological and organizational. They take the form of reluctance to change, insufficient institutional support, and doubts about the quality of online systems (Henderikx et al., 2019; Al Gamdi & Samarji, 2016). In the United States and Europe, teachers also express concerns about work overload and the reliability of digital content.

In contrast, in developing countries such as Morocco and Tanzania, the obstacles are mainly technological: degraded infrastructure, poor connectivity, and lack of coherent ICT policies (Bouyzem & Al Meriouh, 2020; Semlambo et al., 2021). The type of institution and degree of institutional support also play a decisive role in the degree of resilience observed (Alarabiat et al., 2023).

3.2.3. RQ3- What Theoretical Models and Methodologies Have Been Used to Study Resistance to e-Learning in Higher Education?

Existing studies have been mainly based on Innovation Resistance Theory (Ram, 1987; Ram & Sheth, 1989), a theoretical framework that facilitates the differentiation between functional and psychological barriers (Talwar et al., 2020). In contrast, other theoretical frameworks, such as TAM, UTAUT, Behavioral Reason Theory, and Status Quo Bias Theory, are less frequently used (Davis, 1989; Venkatesh et al., 2003; Claudy et al., 2015; Samuelson & Zeckhauser, 1988).

From a methodological perspective, quantitative approaches predominate (42 studies), followed by mixed methods (15), qualitative methods (9), and reviews (10). The tools employed in this study range from surveys to structural equation modeling (SEM), semi-structured interviews, and thematic analysis. This diversity is indicative of the richness of the perspectives adopted, but also highlights the paucity of studies that mobilise integrative and contextualised frameworks, as suggested by the contributions of Mushtaq et al. (2021) and Ma & Lee (2019).

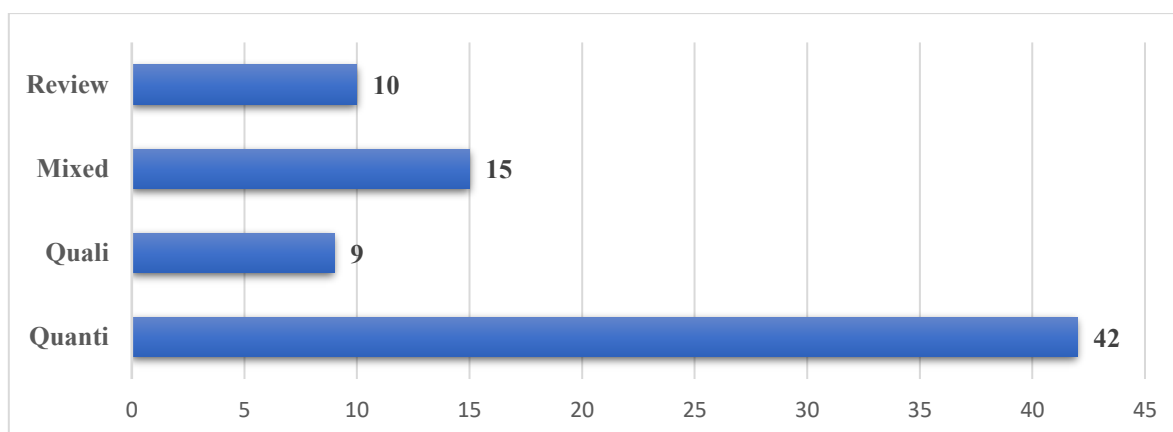


Figure 7. Methodology of the Articles Examined

3.2.4. RQ4- What Practical and Strategic Solutions can be Proposed to Overcome the Barriers Identified and Improve the Integration of e-Learning in Higher Education?

Several contributions have proposed concrete ways to mitigate resistance to e-learning. Basir et al. (2021) emphasize the importance of using rigorous diagnostic tools to identify the specific barriers faced by each audience. Other studies, such as those by Mushtaq et al. (2021) and Zalat et al. (2021), point out that the effectiveness of digital systems depends on three fundamental factors: appropriate infrastructure, institutional support, and continuing education.

Concurrently, Jarelnape et al. (2024) stress the necessity to establish an online learning environment that is both secure and stimulating. Mohan et al. (2020) propose the integration of MOOCs into curricula to enhance their appeal. However, it is evident that there is a paucity of studies that adopt a systemic approach, integrating infrastructure, content, support, and stakeholder engagement. In this regard, Sun et al. (2008) and Jahani et al. (2023) assert the necessity of a concerted strategy that is firmly grounded in local realities and meticulously developed in collaboration with the relevant stakeholders.

4. Practical and Theoretical Implications

Operational analysis of the study's findings underscores the necessity for the implementation of targeted support measures to promote the adoption of e-learning in higher education. This initiative encompasses a range of components, including the reinforcement of technical infrastructure, the establishment of ongoing educational programs for educators and learners, and the formulation of coherent institutional policies. Moreover, the diversification of teaching materials and the implementation of hybrid assessment methods have been identified as effective strategies to enhance stakeholder engagement and ensure academic integrity (Jahani et al., 2023; Bouyzem & Al Meriouh, 2020).

Conceptually, this study contributes to a more nuanced understanding of forms of resistance to innovation in digital educational environments. Utilizing a range of theoretical frameworks, it presents an integrated interpretation of the barriers to the adoption of online learning, connecting technological, organizational, psychological, and sociocultural dimensions (Mushtaq et al., 2021; Ma & Lee, 2019). This strategic positioning paves the way for contextualized research, particularly in Southern countries, where the logic of resistance remains largely unexplored.

5. Conclusion

Despite its potential to inform our understanding of innovation resistance, particularly in the domain of e-learning, the existing body of research remains underdeveloped. A comprehensive examination of the contextual, cultural, and institutional factors that are unique to each academic environment is imperative to comprehend the underlying causes of this phenomenon. The reactions of rejection expressed by learners or users can only be fully understood in light of the specific realities of the institutions concerned.

The results of this review highlight the need to design comprehensive strategies that are adapted to specific contexts, taking into account the particularities of each institution. The analysis distinguishes four main categories of obstacles: technological, institutional, psychological, and cultural, which call for differentiated responses at the organizational, pedagogical, and strategic levels. This review also highlights the importance of aligning educational policies with the real expectations of end users. It calls for a rethinking of digital integration through tailored, sustainable, and inclusive measures, while also calling for further research into the contextual conditions that influence the uptake of educational innovations.

5.1. Limitations and Future Directions

This study has certain limitations. First, there is a lack of literature on the specific contextual factors influencing resistance to e-learning in under-explored regions such as sub-Saharan Africa and Southeast Asia. Second, research focuses primarily on teachers and students, neglecting the perspectives of decision-makers and institutional leaders. Finally, the psychosocial dimensions and effects on online social interactions remain poorly understood. Future studies would benefit from using interdisciplinary approaches and mixed methodologies to understand these resistances better, taking into account the diversity of actors and contexts.

Furthermore, it would be beneficial to examine specific intervention strategies and educational policies that could alleviate the identified resistances and foster a wider and more effective adoption of e-learning. Finally, longitudinal studies would be advantageous for observing evolutions and changes in attitudes over time, thus providing more robust data and more precise recommendations for the future of e-learning in higher education.

Declarations

Contributions of authors. The authors are responsible for the design, writing, and revision of this manuscript.

Conflict of Interest. The authors declare that there is no conflict of interest.

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Statement on data availability. No new data were generated or analyzed in this study. Data sharing is not applicable to this article.

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