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A DECADE OF SYSTEMATIC LITERATURE REVIEW ON STUDENT EXPERIENCE IN MOBILE LEARNING

Haslinda Radzali^{1*}

*Arshad Ayub Graduate Business School, Universiti Teknologi MARA Cawangan Kelantan Kampus Kota Bharu, Kelantan, Malaysia
haslindaradzali@yahoo.com*

Azyanee Luqman²

*Faculty of Business and Management, Universiti Teknologi MARA Cawangan Kelantan, Kelantan, Malaysia
azyanee@uitm.edu.my*

Mohd Nasir Ismail³

*College of Computing, Informatics and Mathematics, Universiti Teknologi MARA Cawangan Kelantan, Kelantan, Malaysia
nasir733@uitm.edu.my*

Abstract: Student experience is vital in successfully implementing mobile learning. Student experience encompasses pragmatic quality (usability and functionality) and hedonic quality (satisfaction and enjoyment) while using mobile devices for educational purposes. However, the student experience in mobile learning depends on technology and human quality. Therefore, this article focuses on a systematic literature review of factors contributing to student experience in mobile learning. For this study, articles were selected from two significant databases, Scopus and Web of Science, and a supporting database, Google Scholar, from 2015 until 2024. Consequently, 434 articles were gathered, and the final 15 related studies were selected concerning factors influencing student experience in mobile learning. Three significant themes or factors emerged from the thematic analysis of this review: technology and application quality, emotion quality, and student experience quality. The results elaborate on the factors that can contribute to student experience, system quality, interface quality, instructor quality, and perceived ease of use. Future research should explore factors influencing student experience in mobile learning to support Sustainable Development Goal 4, which ensures quality education for all.

Keywords: Hedonic quality, mobile learning, pragmatic quality, student experience, systematic literature review

1. Introduction

The phrase “mobile learning” refers to education on a mobile device. According to Crompton and Burke (2018), mobile learning is learning through social and content interaction across multiple contexts using personal electronic devices. The term provides insight into the educational benefits of learning with mobile devices, as learning is not restricted and occurs across various settings, timeframes, subjects, individuals, and technologies. Mobile electronics, including smartphones and tablets, feature a convenient power button and are highly portable. Therefore, based on this criterion, laptops are not considered for mobile learning.

Mobile learning, or m-learning, is an innovative form of distance education that harnesses modern technology to provide instructors and learners with 24/7 access to learning materials and services, enabling maximum learning benefits (Al-Nawayseh et al., 2019). Though mobile learning has been believed to be paramount in education and learning in the higher education environment, it is still in the initial stages of implementation and practical implementation in university settings (Al-Nawayseh et al., 2019).

A systematic literature review (SLR) is the process of identifying, selecting, and critically evaluating research to address a formulated query, as Dewey and Drahota (2016) stated in a web page cited by Charles Sturt University (2022). The SLR process employs a comprehensive search strategy encompassing multiple databases, and the protocol or plan is established before the commencement of

* Corresponding author: Arshad Ayub Graduate Business School, Universiti Teknologi MARA Cawangan Kelantan Kampus Kota Bharu, Kelantan, Malaysia, haslindaradzali@yahoo.com

the review process to facilitate replication by future researchers (Yunus et al., 2023). SLR is essential for guiding and synthesising available topics, identifying biases or voids, and directing future researchers in the appropriate direction for additional research (Antonelli, 2020).

Even though there is quite a lot of existing past research on the factors influencing student experience in mobile learning, there has not been enough done to review the findings thoroughly. This review study aims to identify the patterns and trends from earlier research on student experience in mobile learning. This paper comprehensively covered the entire process of Systematic Literature Review (SLR) to gain a more profound comprehension of the subject. The process involves identifying the reference sources for SLR, formulating the research question, utilising systematic searching techniques, identifying, screening, qualifying the articles, abstracting the work, and analysing the results. The study is strengthened by using existing material as supporting evidence.

2. Methodology

The ROSES (Reporting Standards for Systematic Evidence Syntheses) review protocol serves as the study's guide, seeking to increase transparency and set higher standards for conducting systematic reviews and maps. The protocol starts with formulating the research question and then implements systematic search strategies, including identification, screening, eligibility, quality appraisal, and database extraction and analysis.

2.1. Research Question Formulation

This study aims to identify the factors influencing student experience in mobile learning. Thus, the researcher applies the PICO (Population OR Problem; Intervention OR Interest; Comparison and Outcome) method as the Research Questions Development Tool (RQDT). The population comprises college matriculation students, and the context is mobile learning.

The SLR RQ is:

1. What factors influence the student experience and use of mobile learning?

2.2. Systematic searching strategies

Okoli (2015) emphasises that researchers should choose the criteria for SLR. There are five stages: identification, screening, eligibility, quality appraisal, and data extraction and analysis.

2.2.1. Identification

The identification process began by identifying basic keywords and synonyms. The keywords are derived from the research question, while synonyms are used to broaden the search results. Table 1 displays the research question, keywords, and identified synonyms for string search.

Table 1: Results of Identification Process

Research Question	Keywords	Synonyms
What factors influence the student experience and use of mobile learning?	mobile learning	m-learning
	experience	user experience, u-x

The identification process was conducted through two leading databases, Scopus and Web of Science, and Google Scholar, a supporting database. Table 2 simplifies the search strings, such as Boolean operators, phrase searching, and truncations used in each advanced search throughout all three databases. The documented result of an initial search is the identification process.

Table 2: Full Search String Used in Leading Databases (Scopus, Web of Science) and Supporting Database (Google Scholar)

Section	Scopus	Web of Science (WoS)	Google Scholar
Research Question			

What factors influence student experience and use mobile learning?	TITLE-ABS-KEY (“mobile learning” OR “m-learning”) AND (“user experience” OR “u-x”))	TS= (“mobile learning” OR “m-learning”) AND (“user experience” OR “u-x”))	mobile learning” OR “m-learning” AND “user experience” OR “student experience”
Initial search	=229 articles	=105 articles	=100 articles

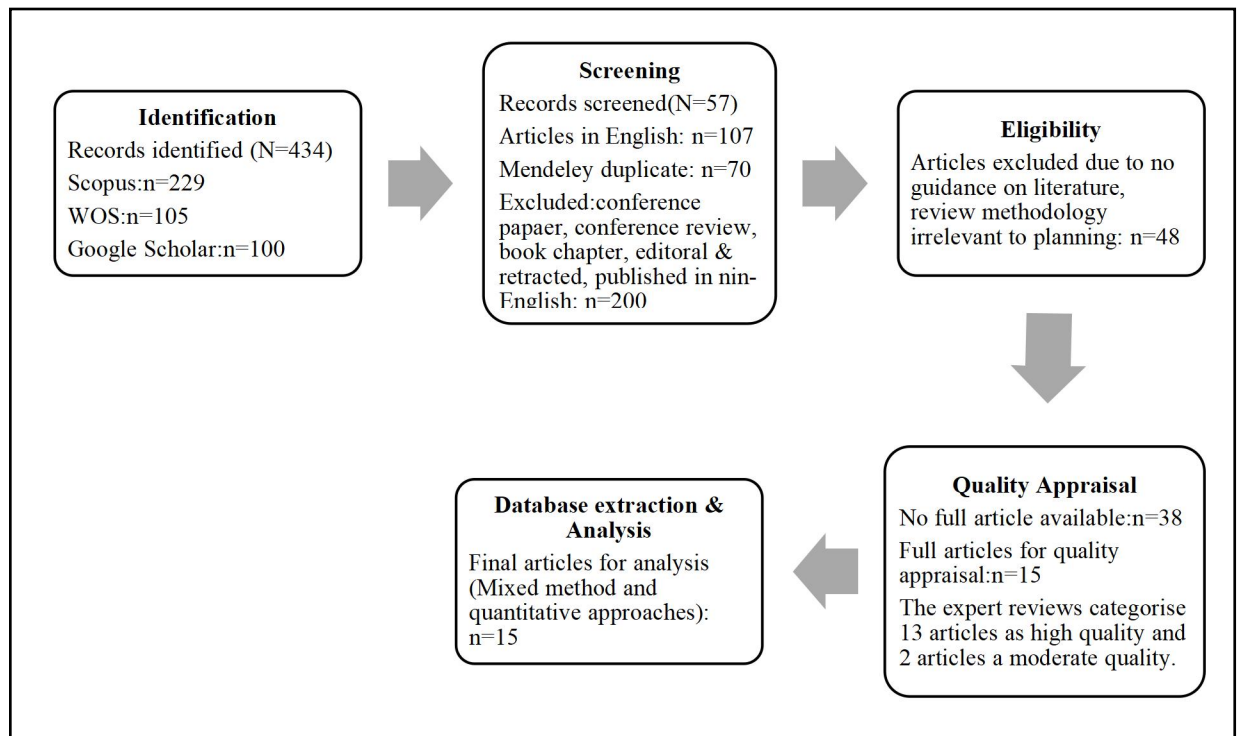
2.2.2. Screening

The screening stage is where articles are included or excluded based on various criteria pertinent to the research objective, such as source type, language, and year of publication. According to Mengist et al. (2020), screening aims to select pertinent literature and identify relevant papers for review.

2.2.3. Eligibility

The researcher proceeded with the eligibility process, which was done manually. Moher et al. (2009) agreed that the researcher might include articles that do not conform to the criteria determined by the researcher after the screening process. This phase entails scrutinising all the selected articles from the previous step to ensure they are relevant to the study. Articles found to be irrelevant and duplicated, with no guidance on literature review methodology and unsuccessful attempts to access the articles, were excluded. Figure 1 portrays the flow diagram to explain the article selection process from the review. The final record for review is 15 articles after proceeding with the stages of SLR from the initial 434 articles found in the early stage.

Figure 1: The Process of Selecting the Articles for the Review



2.2.4. Quality appraisal

The researcher utilises the Mixed Methods Appraisal Tool (MMAT) for quality appraisal,

creating a critical tool for the appraisal phase of systematic reviews encompassing qualitative, quantitative, and mixed-method research (Hong et al., 2018). The articles assessed under this stage are categorised as high, moderate, or low quality. The reviewers must agree with each other and find solutions to disagreements.

2.2.5 Database Extraction and Analysis

At this stage, the researcher utilised a qualitative synthesis method known as thematic analysis. This approach is employed to identify patterns in prior studies, which can be classified based on similarities or correlations among the studies. The researcher examined abstracts followed by full articles, categorising themes under the student experience in mobile learning. The researcher identified the factors affecting student experience across three main categories: technology and application quality, emotional quality, and overall student experience (Relawati et al., 2022; Lee & Xiong, 2021; Criollo-C et al., 2024; Zahtila & Burghardt, 2022).

3. Discussion

Relawati et al. (2022) highlighted that the usability of an application significantly influences user satisfaction and ease of learning. Similarly, Lee and Xiong (2021) emphasised the importance of enhancing system and interface quality to reduce students' anxiety in application-based learning environments. The integration of gamification in educational content has also been shown to effectively enhance cybersecurity teaching by fostering user intention and maintaining a low mental workload. Furthermore, extensive research indicates that emotions play a crucial role in the learning process, with AR-based mobile learning materials designed to elicit specific emotions based on identified principles. Current literature strongly supports that a high-quality student experience is a key factor in achieving successful learning outcomes (Criollo-C et al., 2024). By adopting modern educational approaches, students are encouraged to engage in learning activities using mobile devices in both indoor and outdoor settings, contributing to an overall positive student experience (Zahtila & Burghardt, 2022).

4. Recommendations, limitations, and future studies

In a nutshell, the SLR found that many factors influence student experience in a mobile learning context. Using mobile devices in learning has a broad impact on the learning process and teaching methods. Future studies may have different themes and comprehensive coverage of the group, explaining in detail the factors influencing student experience. Naveed et al. (2023) discovered the potential effect of newly emerging technologies, especially VR and AR, which can be examined at all educational levels. Therefore, future studies should counter the gap by investigating additional factors that may or may not affect the direct relationship. The 2030 Sustainable Development Agenda has been recognised as a global goal for all nations by the United Nations (2023). This allows future researchers to investigate the relationship between student experiences and sustainability.

5. Conclusion

This study explored the factors influencing student experiences in the context of mobile learning. The researcher utilised the SLR method to analyse patterns in prior studies. Conducting an SLR also helps to identify research gaps and directs future inquiries (Petticrew & Roberts, 2008). On top of that, using SLR allows the researcher to approach the current investigation systematically and methodically on factors like system quality, interface quality, instructor quality and perceived ease of use. The findings from the SLR are expected to aid the researcher and others in investigating student experiences from various perspectives or fields.

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