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COMPREHENSIVE SYSTEMATIC REVIEW ON MOBILE LEARNING IN HIGHER EDUCATION

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Abstract:

As mobile technologies continue to make their way into every part of modern life, it is important to systematically study the literature to investigate the many different aspects of M-learning in higher education. The primary aim of this study is to investigate the prevailing trends in mobile learning (M-learning) within the higher education sector, specifically focusing on the period from 2021 to 2023. The intention is to furnish fellow researchers with up-to-date insights into the current landscape of M-learning trends. The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) framework provide Systematic Literature Review (SLR) methodological rigor and quality assurance. Using two digital libraries, SCOPUS and Web of Science, 29 articles were ultimately analyzed. This systematic literature review discusses the mobile learning trend in 4 themes: Acceptance and Adoption of Mobile Learning, factors Influencing Mobile Learning, Perceptions and Attitudes towards Mobile Learning, and effectiveness of mobile learning. This systematic literature review on mobile learning in higher education presents that it is becoming more important. It sheds light on what makes people accept M-learning, how perceptions play a part, and how M-learning affects academic performance. Suggestions for future study in M-learning are to focus on new technologies, making it easier for students with disabilities to use, cultural factors, and environmental effects.

Keywords:

Mobile Learning; Higher Education; Systematic Review

Introduction

Mobile learning, also referred to as M-learning, has become a significant catalyst for change in the realm of higher education. This transformation has been propelled by the extensive accessibility of mobile devices and the advent of inventive mobile applications. In the last ten years, the emergence of mobile learning has significantly impacted conventional educational frameworks, hence introducing novel prospects and obstacles in the realm of pedagogy. The use of digital platforms in education has been significantly expedited by the global COVID-19 epidemic, leading to the increased importance of mobile learning as a crucial tool that extends beyond the confines of traditional classroom settings. Given the increasing ubiquity of mobile technology in contemporary society, it is imperative to undertake an exhaustive examination of existing literature in order to delve into the intricate complexities of mobile learning within the context of higher education.

The purpose of this study is to conduct a comprehensive analysis of current scholarly literature to elucidate the transformational capacity, obstacles, and dynamic patterns in the field of mobile learning. This review aims to contribute to the ongoing conversation on the role of mobile learning in higher education by examining how it may effectively support accessible, equitable, and high-quality education in the digital era.

In order to carry out this analysis, a number of pertinent references have been selected. Traxler (2007) underscores the significance of the individual, contextual, and situational aspects of mobile learning, emphasizing its integration within the realm of informal learning. In their study, Krull & Duarte (2017) conducted a comprehensive analysis of scholarly articles published throughout the timeframe of 2011 to 2015. Their objective is to provide a systematic review that sheds light on the prevailing research patterns pertaining to mobile learning within the context of higher education. The research purposes associated with their studies are reflected in Figure 1.



Figure 1: Distribution of Studies By Research Purpose (Krull & Duarte, 2017).

The study conducted by Kaliisa et al. (2017) examines the utilization of mobile learning in both developed and developing country settings, emphasizing the experimental aspect of its application. In this comprehensive study, Qureshi et al. (2020) thoroughly analyzed the mobile learning landscape over the previous decade. The authors succinctly outline the major discoveries and insights derived from this body of research while also proposing potential avenues for future investigation and exploration. The study conducted by Schuck et al. (2016) investigates the concept of mobile learning inside the "Third Space," with a specific focus on its capacity to connect formal and informal learning contexts. The study conducted by Kaliisa & Picard (2019) centers on examining mobile learning policy and practice within the African context. The authors underscore the significance of ensuring inclusive and equitable access to higher education. The utilization of large-scale educational data and analytics in higher education is examined by Ang et al. (2020), who analyze the associated difficulties and prospects. The study conducted by Teymurova et al. (2020) investigates the utilization of mobile entrepreneurial learning and emphasizes its significance in integrating traditional practices and innovative approaches. The present study conducted by Sobral (2020) offers a bibliometric analysis of mobile learning in higher education. The author examines a selected sample of papers to discern prominent patterns and trends in this field. Elkhateeb et al. (2019) provide an analysis of the development of a mobile learning system specifically designed for Egyptian higher education. The study emphasizes the variety of available mobile learning solutions, as demonstrated by prior research.

Through an examination of pertinent references and the implementation of a comprehensive literature analysis, the primary objective of this review is to make a scholarly contribution toward the comprehension of mobile learning within the context of higher education. Specifically, this study seeks to elucidate the possible effects and obstacles associated with integrating mobile learning in this setting. The primary objective is to provide educators, policymakers, and academics with comprehensive knowledge regarding the potential transformative impact of mobile learning and its significance in defining the future of education within the context of the digital era.

Literature Review

In recent years, there has been a significant surge in the adoption of digital technologies and mobile applications (apps), with a growing focus on their integration into higher education. However, this literature review emphasises their use within online and offline classroom environments rather than exploring their potential for teaching and research applications. For example, Hinze et al. (2023) conducted a study in New Zealand, revealing that mobile apps were primarily utilized for document storage, data exchange, and communication, with limited use for in-class or research-related activities. The study suggests that personal motivation drove app usage, with the potential for increased institutional support and flexibility to promote wider adoption. In the Pacific region, Reddy et al. (2023) noted the extensive use of mobile phones among students but raised concerns regarding the effectiveness of mobile learning, considering students' digital proficiency. Their research unveiled a willingness among Pacific students to embrace mobile devices for higher education, although readiness depended on various contextual factors. This literature review underscores the evolving landscape of mobile learning and the need to understand and address its complexities in modern education.

Amid the COVID-19 pandemic, (Alfandi et al., 2023) conducted an intensive study investigating the multifaceted influences on students' engagement with mobile learning. Their research explored the interplay between students' readiness for mobile learning, emotion regulation, nomophobia, smartphone-related cyberloafing, and smartphone addiction during class. By utilizing structural equation modeling with 719 participants, their findings unveiled significant relationships between M-learning readiness, emotion regulation, nomophobia, smartphone cyberloafing, and smartphone addiction, providing insights into the intricate factors impacting mobile learning participation. In addition, the rise of Information and Communication Technologies (ICT), particularly mobile phones, among students is creating a niche for mobile learning in Pacific higher education. (Reddy et al., 2023). However, concerns remain regarding the efficacy of this innovative intervention, given the digital savvy of Pacific students. Reddy et al.'s study explored Pacific students' readiness and perception of using mobile devices for learning, revealing their willingness and positive outlook toward leveraging mobile phones for higher education. However, readiness for mobile-driven education depends on various contextual factors, necessitating tailored approaches and recommendations for higher education institutions and education ministries in the Pacific region.

Salhab & Daher (2023) study delves into the profound impact of technology on contemporary educational paradigms, specifically the proliferation of mobile learning (M-learning) in the Middle East, an understudied region. Understanding students' attitudes toward M-learning is crucial in this context, as these attitudes can significantly impact students' motivation, performance, and beliefs regarding mobile learning. Utilizing an explanatory sequential mixed methodology, the researchers examined the effects of M-learning on the attitudes of fifty

students in technology education. Their quasi-experiment included phenomenological components, incorporating data from experimental and control groups, as well as focus group discussions and semi-structured interviews with M-learning participants. Through Analysis of covariance (ANCOVA) and content analysis, the study's findings revealed key subthemes, such as personalized learning, increased motivation, decreased frustration, increased participation, familiarity with devices, and increased social interaction. Importantly, the research underscores the significance of institutions adhering to guiding principles when crafting M-learning policies and ensuring customized, interactive M-learning environments that cater to student's diverse needs and learning styles, ultimately improving their attitudes towards M-learning. This study contributes to the expanding field of M-learning by shedding light on its potential and the necessary considerations for its successful integration into educational contexts.

The demand for effective mobile training (M-training) has increased in the rapidly changing mobile technology landscape, causing training centers to offer m-training via mobile devices. Ensuring appropriate m-training course content creation has emerged as a crucial professional development challenge, as it facilitates employee knowledge acquisition and skill enhancement within this dynamic mobile environment. Prior research has identified inherent difficulties in this domain, such as lacking a comprehensive theoretical framework to guide the design of interactive m-training content capable of engaging and motivating trainees via mobile devices. Al-Amri et al. (2023) present a framework for creating interactive mobile augmented reality training (MAR) content to address this deficiency. Their study employs a mixed-methods approach, beginning by extracting key elements from the literature to build a foundational framework. The framework is subsequently validated through expert interviews and trainee testing, demonstrating its validity and efficacy. This systematic framework incorporates six key elements and provides an instructional design guideline checklist, contributing to the establishment of a theoretical basis for designing engaging m-training course content and aiding trainers and designers in enhancing employee engagement in M-training initiatives. The study provides valuable insights for the ongoing development of interactive M-training courses, highlighting its potential to revolutionize professional development in a rapidly transforming technological environment.

Despite the increase in blended education studies since COVID-19, there is a noticeable research gap in the field of blended tertiary education, specifically in the context of self-regulated and mobile-mediated learning. Nikolopoulou (2023) conducted a pilot study in Greece that included interviews with 19 undergraduate and graduate students to address this shortcoming. The study sought to identify the facilitators and impediments to self-regulated and mobile-mediated learning in blended learning environments. Participants perceived Blended learning as beneficial for autonomy and self-regulated learning, especially when mobile device ownership, ease of use, and familiarity were present. Course structure, individual factors (educators' and students' knowledge, skills, attitudes, and concerns), and technological factors were the primary enablers/facilitators and impediments (infrastructure and connectivity). Course organization and student and instructor roles are expected in blended education courses. The implications for students, educators, and university policy and practice were discussed.

This extensive literature review has shed light on the transformative potential of mobile learning (M-learning) in various educational contexts. Increased emphasis is being placed on integrating mobile technologies and applications into higher education, particularly in classroom settings, as a result of the rapid spread of mobile technologies and applications. However, the studies

reviewed here reveal that the full scope of M-learning impact extends beyond the classroom, including self-directed learning, professional development, and digital engagement. These findings highlight the need for institutions to adapt and provide customized, interactive M-learning environments, taking into account the readiness, attitudes, and role of educators of their students. Furthermore, as the educational landscape continues to evolve, M-learning remains a dynamic field requiring ongoing research and innovation to unlock its full potential in promoting inclusive, equitable, and high-quality education in alignment with global educational goals.

Material and Methods

Systematic reviews are necessary for synthesizing and summarising to provide a comprehensive and rigorous analysis of the available literature, aiding decision-making and directing future research. Nonetheless, the quality and openness of systematic reviews can vary, which can affect their dependability and utility. Various reporting guidelines have been developed to ensure that systematic reviews are conducted and reported transparently and standardized (Kim et al., 2021). For this paper, the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement is used to improve the quality and transparency of this systematic review. The PRISMA statement is an evidence-based guide consisting of a checklist and flowchart that authors use as tools.

Identification

The systematic review process consists of three main phases for selecting several appropriate papers for this report. The initial step is keyword recognition and searching for connected, similar terms using the thesaurus, dictionaries, encyclopaedia, and previous research. Consequently, after selecting all pertinent keywords, search strings on the databases Scopus and Web of Science (see Table 1) have been developed. In the first phase of the systematic review procedure, this study successfully retrieved 4,470 articles from both databases.

Table 1: The Search String

SOURCE	SEARCH STRINGS
Scopus	TITLE-ABS-KEY (("mobile learning" OR "M-learning") AND ("higher education" OR "tertiary education" OR training)) AND (LIMIT-TO (PUBYEAR , 2021) OR LIMIT-TO (PUBYEAR , 2022) OR LIMIT-TO (PUBYEAR , 2023)) AND (LIMIT-TO (DOCTYPE , "ar")) AND (LIMIT-TO (LANGUAGE , "English")) AND (LIMIT-TO (OA , "all")) AND (LIMIT-TO (PUBSTAGE , "final")) AND (LIMIT-TO (SUBJAREA , "SOC"))
Web of Science	of ("mobile learning" OR "M-learning") AND ("higher education" OR "tertiary education" OR training) (All Fields) and 2023 or 2022 or 2021 (Publication Years) and Article (Document Types) and English (Languages) and All Open Access (Open Access)

Screening

During the screening phase, potentially relevant research materials are examined to determine whether their content matches the established research question(s). Mobile learning in higher

education is one example of a content-related screening criterion that is routinely applied. In this phase, duplicate papers will be removed from the article list. In the second stage of the screening process, 422 papers were evaluated based on the study's inclusion and exclusion criteria, whereas 4048 papers were rejected in the first stage (see Table 2). Literature (research articles) served as the first criterion, as it is the most important source of useful information. This study excluded press conferences, books, reviews, and other publications. The review was also limited to English-language publications. It is essential to remember that the approach was only applicable between 2021 and 2023.

Table 2: The Selection Criterion

Criterion	Inclusion	Exclusion
Language	English	Non-English
Timeline	2021 – 2023	< 2021
Literature type	Journal (Article)	Conference, Book, Review
Publication Stage	Final	In Press
Subject Area	Social science	Beside Social science

Eligibility

For the third step, known as eligibility, 398 articles have been prepared. Each article's titles and key content were scrutinized at this stage to ensure that the inclusion criteria were met and that the articles were relevant to this research and its objectives. Therefore, 185 articles were excluded because they were out of scope, 160 were excluded because their titles were insignificant, and 24 were excluded because their abstracts did not directly relate to the study's objective. Hence, 29 articles are finally available for review as per Figure 1.

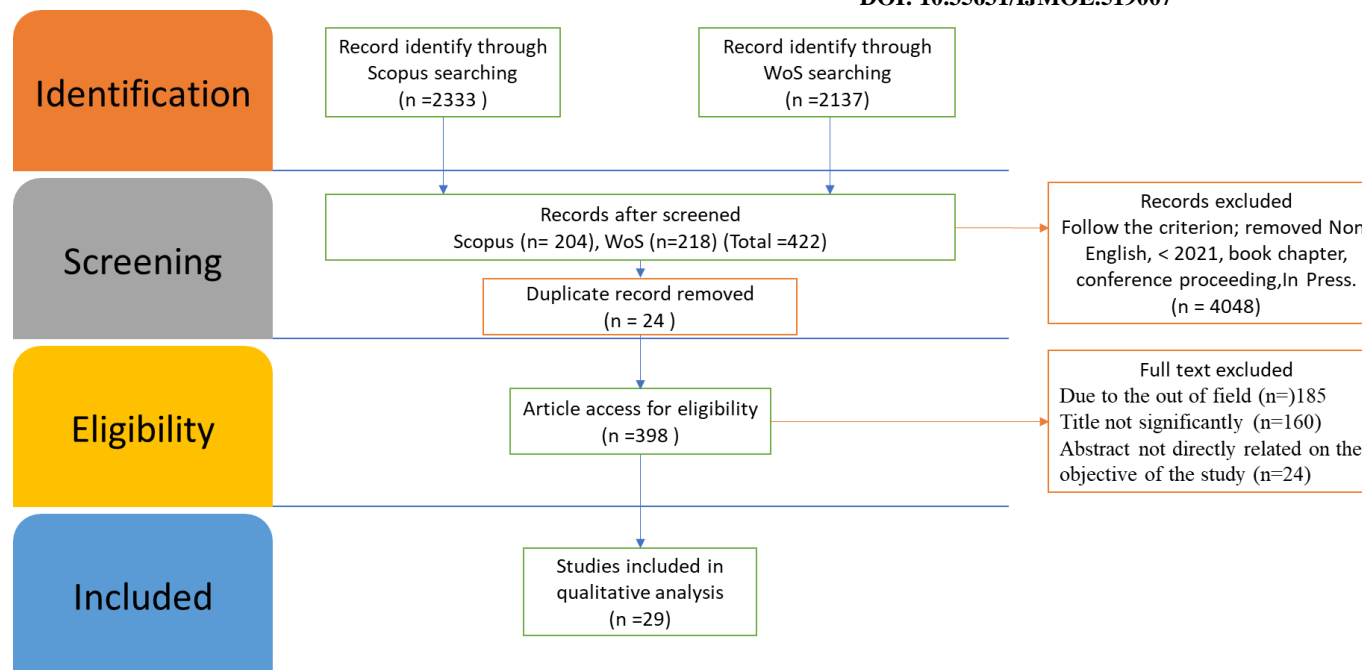


Figure 2: Adaptation of the PRISMA Diagram for the Proposed Searching Study Flow Diagram (Page et al., 2021)

Data Extraction and Analysis

This study employed an integrative analysis as a way of assessment to investigate and consolidate several research designs, including qualitative, quantitative, and mixed methodologies. The primary objective of the research was to establish suitable subjects and sub-topics, with the initial phase of the theme's development being the acquisition of data. The authors conducted a comprehensive assessment of 29 papers in order to identify conclusions or details that address the topics discussed in this research. Similarly, the authors and experts evaluate each mobile learning article, draw conclusions, and develop themes. Correspondingly, the authors and experts evaluate every mobile application, conclude, and create themes. As a result, the key topics that emerged from the approach are Acceptance and Adoption of Mobile Learning, factors Influencing Mobile Learning, Perceptions and Attitudes towards Mobile Learning, and the effectiveness of mobile learning.

The authors then returned to each previously established theme and any linked themes, conceptions, or ideas. Within the context of this study, the corresponding author and several co-authors collaborated to create themes based on data. Throughout the data analysis process, a log was kept documenting any analyses, perspectives, or other ideas related to data interpretation. The authors thoroughly examined the results to identify any shortcomings in the theme-creation process. To be clear, if there are any differences between their topics, the authors mention them.

As a result, the developed themes were modified to ensure consistency. The examinations were done by two specialists, one with competence in Educational Technology and the other in Technical and Vocational Education, to ensure the legality of the problems. The expert review phase verified that each theme was clear, significant, and suitable by establishing domain validity. The expert consensus method included the systematic use of an Excel spreadsheet. The spreadsheet was generated using conventional methods and utilized as a tool for data

management and filtering. The experts employed a tabular structure within the Microsoft Excel spreadsheet to document their evaluations, apply filters to articles based on predetermined criteria, and categorize findings by emergent themes. The manual design of the Excel spreadsheet offered a flexible and adaptable method for data organization during the expert evaluation stage. The authors made changes at their discretion in response to experts' feedback and professional comments.

Result and Finding

There are 29 papers included and categorised by themes namely Acceptance and Adoption of Mobile Learning, factors Influencing Mobile Learning, Perceptions and Attitudes towards Mobile Learning, and effectiveness of mobile learning. The distribution of the papers are shown in figure 3.

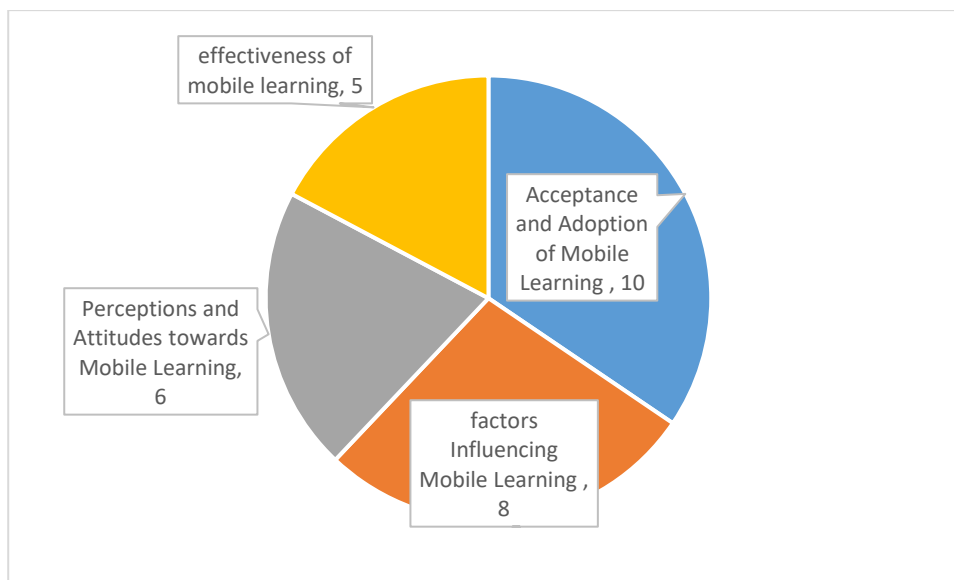


Figure 3: Number of Papers Categorised By Theme

Acceptance and Adoption of Mobile Learning

The results of several studies shed light on crucial aspects of the acceptance and adoption of M-learning in higher education. The findings in Sitar-Taut's (2021) study suggest that universities may improve students' M-learning experience by leveraging social support groups and incorporating gaming elements into educational systems. By doing so, institutions can create an atmosphere in which M-learning is a fun and engaging educational tool.

Valencia-Arias et al. (2023) studies highlight the importance of subjective norms and attitudes in shaping students' M-learning attitudes. These attitudes are significantly influenced by perceived usability and learning autonomy, highlighting the need for a holistic approach when implementing virtual programs that utilize mobile devices as educational support tools. Institutions can foster positive attitudes and encourage the adoption of M-learning through this method.

The significance of "Satisfaction" as a key driver of user behavior in M-learning is a prominent theme that emerges from the body of research by Shaya et al. (2023). Specifically,

"Performance Expectation" has been identified as a major predictor of satisfaction, highlighting the importance of developing a positive and efficient M-learning environment. These findings significantly contribute to our understanding of M-learning acceptance and adoption and have practical implications for educational institutions attempting to promote its use among students.

Another study by Rysbayeva et al. (2022) indicates that university students demonstrate a high level of readiness for mobile learning. However, a number of factors play a significant role in determining their intent to utilize M-learning successfully. Notably, the results of Kaisara et al. (2022) research show a strong positive correlation between performance and expectation and hedonic motivation, with hedonic motivation as a mediator between performance expectation and behavioral intention. These insights hold valuable implications for post-pandemic mobile learning implementation efforts, allowing institutions to tailor their approaches effectively and increase adoption rates.

In addition, the study by Drwish et al. (2023) highlights the significance of various quality factors, such as system quality, service quality, and customer satisfaction, as well as perceived factors, such as usefulness and usability. Information quality may not significantly impact actual mobile learning use. However, these other factors emerge as key drivers of adoption, highlighting their role in influencing students' acceptance and continued use of M-learning.

Most study in mobile learning highlights the potential advantages of utilizing remote learning systems amidst the COVID-19 epidemic while also revealing a notable limitation. A study by Akour et al. (2021) reveals that the efficacy of these systems may be reduced due to the emotional distress encountered by students. The concern of inadequate academic achievement, exacerbated by the stress arising from familial circumstances and the sadness associated with the loss of social relationships, raises doubts about the efficacy of these educational resources. Prioritizing the resolution of these emotional concerns becomes of utmost importance, as the mere implementation of distant learning systems proves inadequate. In order to optimize the efficacy of these platforms, it is necessary to adopt a comprehensive approach that integrates emotional well-being and intellectual support.

In terms of technicality, a study by Camilleri & Camilleri (2022) indicated that the presence of supportive factors, such as the availability of resources, continuous training opportunities, and technical support, had an impact on the level of engagement exhibited by the participants in M-learning programs. The respondents did not report any influence from external sources in their decision to utilize mobile devices for educational reasons. The findings additionally indicate that the participants possessed a strong familiarity (and adaptation) with the utilization of mobile devices and their corresponding applications. It is apparent that they aided in enhancing their educational experiences.

The results of research by Villa et al. (2021) indicate that mobile learning exhibits a degree of organization, as seen by its alignment with the fundamental principles of mobile learning. Nevertheless, the complete extent of its potential has yet to be realized. Despite the presence of favorable circumstances for mobile learning, students predominantly employ their mobile devices for educational purposes beyond the confines of the institution's prescribed learner management system. It highlights the necessity for policy modifications inside institutions that seek to incorporate mobile technologies to improve accessibility and instructional excellence.

The findings of another study by Adzifome & Agyei (2023) demonstrate that mobile learning is prevalent within the educational setting, exhibiting numerous characteristics that define its nature. Nevertheless, the full extent of its potential has yet to be realized. Despite the presence of conducive factors for mobile learning, students primarily employ their mobile devices for educational purposes beyond the confines of the institution's prescribed learner management system. It emphasizes the necessity for institutions, particularly those with similar objectives of improving access and instructional quality using mobile technology, to reassess their policies and procedures to ensure successful implementation.

Factors Influencing Mobile Learning

A variety of factors influence the adoption of mobile learning. The behavioral intention of remote learning students is greatly influenced by various factors, including quality of service, effort expectancy, facilitating conditions, gender, educational level, and device type. In addition, promoting mobile learning utilization is facilitated by legislative backing and mobile learning efforts spearheaded by Saudi universities and the Ministry of Higher Education (Al Masarweh & Afandi, 2022). The acceptability of mobile learning among students for the purpose of studying English as a Foreign Language (EFL) is well acknowledged, as it plays a crucial role in effectively improving language competency (Lin et al., 2023). In the context of mobile learning, there is evidence of active learner participation in a variety of instructional roles. However, it is essential to emphasize that there are variations in findings across different research studies (Chen, 2023).

Ease of use is the most influential factor in the design of mobile learning tools (Dolawattha et al., 2021). According to Yu & Zhang (2021), a favorable relationship exists between individual traits and technological aspects, contributing to mobile learning adoption. This acceptance subsequently leads to an improvement in the efficiency of mobile learning. Several elements, such as the perception of enjoyment, expectations of performance and effort, self-efficacy, and social influence, substantially impact students' propensity to adopt mobile learning. This, in turn, has consequences for their effective use of mobile learning resources (Izkair & Lakulu, 2023). The successful creation and evaluation of gamified mobile learning applications necessitates careful consideration and evaluation to cater to the specific requirements of students (Roslan et al., 2023).

Students' preferences for mobile learning are heavily influenced by factors such as device connectivity, compatibility, memory, performance, network coverage, and speed. These factors offer university administrators and developers valuable insights into effectively implementing mobile learning (Alghazi et al., 2021).

Perceptions and Attitudes Towards Mobile Learning

According to Pham & Truong (2023), students demonstrate a strong inclination towards mobile learning, highlighting its advantages, such as convenient access to resources and materials, enhanced communication with peers and instructors and the cultivation of skills. According to a recent study conducted by Saleh & Jalambo (2022), the utilization of mobile phones has been found to positively impact female students' abilities, academic achievements, and learning experiences, regardless of their chosen academic specialization. Mobile devices are predominantly utilized for the purposes of doing information searches, swiftly accessing course materials, and engaging in conversation with classmates and tutors. Although mobile learning offers advantages such as flexibility and quick access, it also presents obstacles such as internet

connectivity and distractions (Nikolopoulou, 2022). According to Chambi et al. (2023), implementing mobile learning in higher education settings has been found to enhance the classroom environment, increase attendance rates, and improve material retention among students.

The readiness of students to engage in mobile learning is contingent upon a range of circumstances, hence warranting more investigation (Reddy et al., 2023). According to Rossiter et al. (2022), utilizing personalized mobile learning resources provides advantages in terms of consistency, relevance, flexibility, and efficiency. However, it is important to note that the development and maintenance of such resources necessitate substantial investments. The aforementioned findings jointly illuminate the perceptions and attitudes of students towards mobile learning, hence emphasizing its potential to augment the learning experience.

Effectiveness of Mobile Learning

Numerous research has provided empirical evidence supporting the efficacy of mobile learning in augmenting students' academic achievements. According to a study conducted by Al-Momani & Pilli (2021), it was found that students who were exposed to Innovative Mobile Educational Learning Systems (IMELS) within a blended learning setting exhibited superior academic performance compared to the control group. This study highlights the favorable influence of IMELS on academic achievement, interactions, and overall satisfaction. Voshaar et al. (2023) conducted a study that revealed a notable disparity in final examination results between individuals who utilized mobile applications with serious intent and those who did not. This finding provides further evidence supporting the advantageous impact of mobile technology on acquiring knowledge. Moreover, the implementation of mobile learning had a notable influence on students' academic achievements, as evidenced by the examination scores related to basketball proficiency. The experimental group, which utilized mobile learning, performed better than the control group (Ishak et al., 2022).

In addition, it has been observed that mobile learning directly impacts the development of creative and critical thinking abilities. It is supported by a study conducted by Araiza-Vazquez et al. (2023), which found that students who were exposed to a mobile learning strategy exhibited higher average scores in creativity. Similarly, a separate study demonstrated that the group subjected to a mobile learning system under investigation exhibited superior performance compared to the control group in terms of retention, comprehension, and situational interest. This finding underscores the beneficial impact of the mobile learning system on both museum-based learning and overall academic achievement (Chin et al., 2023). The data collectively emphasize the efficacy of mobile learning in enhancing students' academic achievements and abilities.

Discussion and Conclusion

Several key themes emerge from a review of the literature on mobile learning (M-learning) in higher education. These themes include how M-learning is accepted and used, the different things that affect its use, how people think and feel about M-learning, and how well this method works.

As for the first theme, "Acceptance and Adoption of Mobile Learning," research shows that making M-learning more fun by adding social support groups and game-like features can help. Students' willingness to use M-learning is affected by subjective standards, attitudes, and how

easy they think it is to use. "Satisfaction" is a key factor in how people act in M-learning, with "Performance Expectancy" another important one. Students are very ready for M-learning, and there is a strong link between achievement expectations and hedonic motivation. The adoption of M-learning is also affected by customer satisfaction, system quality, service quality, and business quality. Even though M-learning has benefits during the pandemic, it is only useful if students are emotionally healthy and have support. Technical factors, like available tools and available help, affect how engaged students are (Camilleri & Camilleri, 2022). Sitar-Taut (2021) discusses the acceptance and use of mobile learning in the context of socially distancing circumstances; this is relevant to the topic. Nevertheless, it does not specifically address the more general issues or difficulties associated with mobile learning in higher education.

The second theme, "Factors Influencing Mobile Learning," talks about the different things that affect the use of M-learning. Some of these are the type of service, the level of effort expected, the conditions that make it easier, the gender, the level of schooling, and the type of device. Support from lawmakers and mobile learning programs help get people to use M-learning. It is well known that M-learning can help teach EFL. In mobile learning, students take an active role in different teaching jobs, though these roles vary from study to study. When making M-learning tools, making them easy to use is very important. The adoption of M-learning is affected by personal and technological factors, making it more effective. Students' willingness to use M-learning and how well they do with it are affected by how much they enjoy it, how much they expect to perform, how much they expect to work, their self-efficacy, and their social impact. To meet the wants of students, developers of gamified M-learning apps must be very careful. Students' desire to use mobile learning is affected by gadget compatibility, memory, performance, network coverage, and speed (Alghazi et al., 2021).

The third theme, "Perceptions and Attitudes toward Mobile Learning," shows that students are generally positive about M-learning, which they do because it is easy to access materials, communication is better, and skills are developed. Using cell phones has a good effect on the skills, academic performance, and learning experiences of female students. Students mostly use their phones to look for information, quickly access course materials, and talk to their friends. M-learning has some benefits, but it also has some problems. When mobile learning is used in higher education, it improves the classroom setting, student attendance, and their ability to remember what they've learned. Readiness for mobile-driven education is affected by several things that need more research. Customized mobile learning tools have benefits like being consistent, useful, adaptable, and effective, but they cost a lot to build and keep up (Rossiter et al., 2022)

Real-world proof supports the fourth theme, "Effectiveness Of Mobile Learning," that M-learning can help students do better in school. IMELS improve academic performance, social interactions, and student satisfaction in a blended learning setting. When students use mobile apps for schoolwork, they do better on tests. Students do better in school and get higher test scores when mobile learning is used. Using M-learning can help you learn how to think creatively and critically. The suggested mobile learning method also improves students' ability to remember, understand, be interested in, and do well in school (Chin et al., 2023).

In conclusion, studies on mobile learning in higher education show it is becoming more important. The studies highlight what makes people accept M-learning, how perceptions play a part, and how M-learning affects academic performance. These results make it clear that higher

institutions must improve their use of M-learning. They stress that M-learning can be a useful tool for enhancing learning results and creating interesting learning environments in changing higher institutions. Recommendations for prospective research in the realm of M-learning center around four key areas: advancements in new technologies to enhance accessibility for students with disabilities, the influence of cultural factors, and the ecological impacts of M-learning. As technology changes, it is important to keep M-learning up to date and look at how it works with new tools. Experiences with M-learning are likely to be changed by new technologies like augmented reality (AR), virtual reality (VR), Artificial Intelligence (AI), and the Internet of Things (IoT). To make M-learning more accessible, testing how well assistive tools and inclusive design principles work in M-learning platforms and apps is important. Comparative studies of different countries and areas can help us understand cultural norms and expectations, which can help us make M-learning strategies sensitive to different cultures. Environmental effects should also be considered, including how much energy is used, how much electronic waste is made, and how to use technology that does not harm the environment.

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