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REVIEW

Exploring EFL Blended Mobile Learning: A Systematic Literature Review

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ABSTRACT

The growth of mobile learning significantly portrays flexibility and accessibility. It increased the approach to education for both learners and teachers globally. Although numerous studies have examined the state of mobile learning (M-learning), there remains a need for more focused research, particularly within the context of the English as a Foreign Language (EFL) blended learning environment. This study identifies a comprehensive analysis of blended mobile learning research conducted from 2020 to 2024. A search across databases yielded 1096 articles from Scopus and Google Scholar, which were subsequently filtered down to 41 relevant studies for in-depth analysis, following a Systematic Literature Review (SLR) protocol. All 41 screened articles focus on the EFL context. The use of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) design provided structured and valid data for the findings. The study identified key applications, regional perspectives, the implementation of blended learning, and factors that contributed to blended mobile learning experiences. The analysis also explored the benefits, challenges, and potential opportunities associated with this learning modality. The study underscores the importance of addressing challenges such as technological limitations

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ARTICLE INFO

Received: 29 April 2025 | Revised: 29 May 2025 | Accepted: 5 June 2025 | Published Online: 11 June 2025
DOI: https://doi.org/10.30564/fls.v7i6.9772

CITATION

Widora, I., Hidayati, S., Triastuti, A., et al., 2025. Exploring EFL Blended Mobile Learning: A Systematic Literature Review. Forum for Linguistic Studies. 7(6): 821–832. DOI: https://doi.org/10.30564/fls.v7i6.9772

and unequal access to ensure that blended mobile learning benefits are equitable and inclusive in the EFL context. This SLR aims to contribute to a deeper understanding of the foundational principles necessary to inform policymakers, course designers, and blended learning facilitators in optimizing M-learning.

Keywords: Blended Learning; EFL; M-Learning

1. Introduction

The utilization of M-learning has accelerated rapidly since the pandemic. According to the March 2024 National Socio-Economic Survey (Susenas), approximately 84.26% of students aged 5–24 years use mobile phones, and 19.35% use computers, representing an increase from the 2021 and 2024 surveys[1]. This trend reflects the educational contexts that are facing the demands of the 21st century. One of the crucial necessities is developing strong communication abilities for addressing the global world[2]. Language is a fundamental tool that facilitates all aspects of human communication[3]. As an international language, English has become an essential competency[4, 5].

English language education covers several key skills: listening, speaking, reading, and writing[6]. Each of these skills is critical for mastering English in an increasingly multimedia-driven environment[7]. Blended learning, which combines traditional and digital methods, is becoming more common, and its impact continues to grow[8, 9]. While students widely use mobile devices, the full potential of mobile learning to enhance EFL instruction remains underutilized[10]. Therefore, it is essential to understand how mobile learning can support the development of all these language skills[11].

This review highlights the need to integrate mobile learning implementation into EFL blended learning. The COVID-19 pandemic has accelerated the shift toward online and blended learning environments, and many educational institutions struggle to effectively incorporate mobile learning into their language instruction[12, 13]. Mobile devices are accessible and flexible tools that represent a valuable medium for enhancing language learning, particularly for students in remote or underserved regions[14, 15]. Understanding how mobile learning can support the development of essential language skills is vital[10]. This knowledge is crucial for guiding students to navigate an increasingly multilingual and linked world[16].

Although interest in mobile learning has grown, most research in EFL contexts has primarily focused on the general use of digital tools rather than specifically examining how mobile devices support the development of all core language competencies[17]. Previous studies often address individual skills in isolation, leaving the integrated development of English language skills in blended learning environments largely underexplored. Moreover, much of the existing literature tends to focus on implementations in urban or technologically advanced settings. As a result, there is limited insight into how mobile learning operates in under-resourced or rural areas, where internet connectivity and access to digital tools remain significant challenges[18]. These gaps highlight the need for a systematic review that explores how mobile learning can support the development of all English skills in various contexts[10, 17, 19].

The findings of this review are significant for educators, curriculum developers, and policymakers. This SLR examines the role of mobile learning in EFL education, particularly within blended learning environments. Since mobile device use has increased following the pandemic, it is essential to understand how mobile devices impact English language learning to ensure students learn effectively[20, 21]. By focusing on blended learning contexts, this study contributes to the comprehensive discussion of how mobile technologies can complement traditional teaching methods. In blended learning models, online components are integrated with face-to-face instruction, offering students a combined physical and digital learning experience[22, 23]. Although numerous SLRs on M-learning have been conducted[13, 21, 24], most have addressed either language education, mobile learning, or blended learning in isolation. These reviews often overlook recent changes and challenges in using mobile devices for English learning across both online and in-person modes. Elaish et al.[10] highlight the need for a comprehensive review, given the significant impact that language differences have on study outcomes.

In line with this objective, the present review aims to

address these gaps by conducting SLR of the role of mobile learning in enhancing EFL contexts in blended learning environments. Unlike previous studies that have focused on isolated topics, this review adopts a holistic approach, analyzing how mobile learning tools can promote the integrated development of language competencies. The review is guided by two central research questions concerning the implementation of mobile learning across diverse educational environments:

RQ1. How does mobile learning support blended learning in the EFL context?

RQ2. What challenges and opportunities arise when adapting mobile learning to enhance English language skills in blended learning environments?

The structure of this study includes Section 2, which outlines the methods and materials used in identifying the integration of mobile learning in blended EFL environments; Section 3, which presents the findings and discussions on the challenges, opportunities, and student engagement related to mobile learning in this context; and Section 4, which offers conclusions, limitations, and recommendations for future research to address the identified gaps.

2. Materials and Methods

This study meticulously employed an SLR to gain a clear and detailed understanding. According to Qazi et al. [13], SLR is a method used to select, identify, and summarize relevant research articles to have a deep and accurate understanding of the topic. The goal of a systematic review is to get comprehensive insights by synthesizing theories across various fields and subfields [25].

According to Liberati et al. [26], the tailored Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) graphic followed the steps of the review process: (i) identifying resources, (ii) selecting studies, (iii) extracting and synthesizing data, and (iv) analyzing the data. Therefore, the updated PRISMA guidelines for reporting systematic reviews provide a clear and detailed visualization of the methodology (**Figure 1**). This visual representation of the literature search and review process was utilized to address the research questions, giving a balanced and in-depth summary of the current findings.

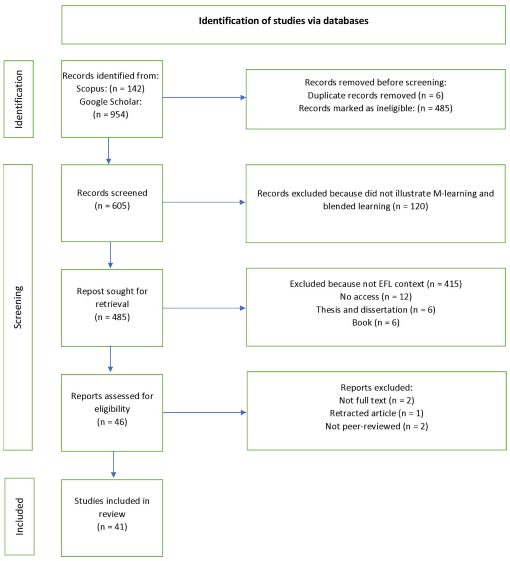

Figure 1. PRISMA design.

2.1. Identifying Resources

The first step in identifying resources involved selecting relevant keywords. The researcher initially used the term "mobile learning" to conduct a comprehensive search on Scopus and Google Scholar for relevant articles published within the last 5 years, from 2020 to 2024. Scopus and Google Scholar were chosen for this SLR to ensure a comprehensive and diverse collection of academic resources. Scopus provides access to high-quality, peer-reviewed articles from reputable journals, along with detailed citation tracking, ensuring that only rigorously vetted studies are included. Meanwhile, Google Scholar offers broader coverage, including grey literature like theses and conference papers, allowing for a more inclusive search across various disciplines. By utilizing both databases, this review encompasses a diverse range of relevant sources, striking a balance between scholarly rigor and comprehensive accessibility.

By typing keywords of "Mobile Learning" or "M Learning" or "M-Learning" or "Mobile-Assisted Language Learning" or "MALL", and "EFL Learners" or "EFL", and "Mobile Apps" or "Mobile Applications" in Scopus website, the researcher found 717 articles with the limitation of years, document type, English language, and all open access articles. To further refine our search and address the research questions, we added the keyword "blended learning" and found 142 related articles. Next, the researcher accessed the Google Scholar website by searching the word string "Mobile Learning", "EFL", and "Blended Learning", then

found 954 articles. This search phase got a total of 1,096 articles across various subjects.

2.2. Inclusion and Exclusion Criteria

The goal of this process was to filter out non-educational research articles and focus solely on those relevant to educational research. **Figure 1** outlines a three-stage procedure based on predefined inclusion and exclusion criteria set by the researchers. The first stage involved scanning databases using relevant keywords and eliminating duplicate or irrelevant articles, including those generated by automated search techniques. Next, articles were manually excluded based on irrelevant titles, keywords, abstracts, or full texts. Papers that did not meet the following criteria were excluded: those focusing on education research, relevant to M-learning applications, available in English, suitable for the field, peer-reviewed status, in an EFL context, or accessible as full texts. A total of 1,096 articles were initially identified through a broad search across two databases. After reviewing titles, keywords, and abstracts, 491 articles were eliminated based on the exclusion criteria, including duplicates. Further investigation led to the exclusion of 563 additional papers. Ultimately, 41 peer-reviewed journal articles were approved for inclusion.

2.3. Extracting and Synthesizing Data

The data extraction process involved multiple phases. Once the articles were narrowed down to the final selection, data were retrieved from the full-text publications. This involved reading each article in its entirety and extracting relevant information. After an initial categorization, subcategories were assigned to the authors based on their areas of expertise. The extracted information from the full-text articles that met the inclusion criteria included details such as the types of mobile learning applications, phone devices, blended learning, year of publication, country, authors, study population, educational level, study focus, and main findings. Additionally, another variable was calculated based on key findings, categorizing user sentiments as Negative, Neutral, or Positive to capture the users' perspectives.

2.4. Analyzing Data

The data for the reviews was analyzed using Google Sheets and the Covidence app, following a content analysis process. The choice of these tools was based on their ability to handle large datasets and their suitability for the content analysis method. The researcher carefully chose the papers for the dataset and conducted a thorough analysis to gather key information relevant to the research questions. This system involved closely examining each section of the articles to extract the necessary data. The process concluded with organizing the collected data in the findings section, categorizing it under subheadings aligned with the specific areas of interest.

3. Results and Discussion

In identifying gaps within current research, this study aims to uncover recent trends in M-learning for EFL in blended learning contexts, with a focus on user perceptions, challenges, and opportunities. The study also aims to analyze key factors influencing the effectiveness of blended M-learning, including user sentiment, perceived benefits, and barriers in EFL education. Through SLR, the researchers conducted a detailed content analysis to address these aspects, responding to the formulated research questions outlined below.

3.1. Demographic Characteristics

The demographic analysis of the research articles in **Figure 2** reveals a strong emphasis on comprehensive data analysis, with the majority of studies adopting mixed-methods studies (43.9%), as well as significant portions using quantitative (29.3%) and qualitative (24.4%) approaches. In comparison, classroom action research is less common (2.4%). The majority of studies are conducted in developing countries (80.5%), with fewer from developed nations (17.1%), including some from Australia, and very few cross-country studies (2.4%). Most of the research targets higher education populations (75.6%), with smaller focuses on secondary education (14.6%) and vocational education (9.8%). Geographically, the articles are concentrated in Asia, parts of Africa, and Australia, with fewer studies originating from Europe and the Americas. This distribution reflects an emphasis on studying educational challenges and developments in less economically developed regions, particularly within higher education contexts. The predominance of mixed-method, quantitative, and qualitative studies indicate a strong focus

on empirical research over exploratory studies. This finding suggests an emphasis on comprehensive data analysis, particularly within developing countries and higher education populations, while classroom action research remains limited.

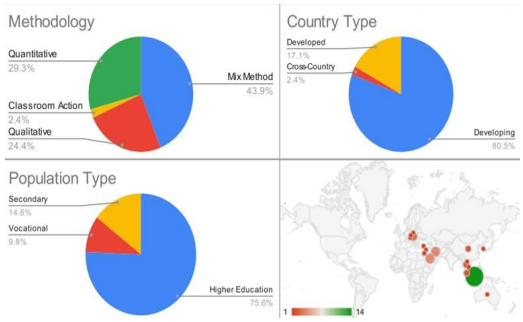

Figure 2. Blended mobile learning studies regarding methodology, country type, geo chart, and population type.

RQ1. How does mobile learning support blended learning in EFL context?

3.2. Role of Mobile Learning in Blended Learning Environments

The analysis of the articles reveals a predominance of mixed perceptions, with 29 articles categorized as having both positive and negative perceptions. This data is significantly higher than the 10 articles with exclusively positive insights and the articles marked as neutral. Notably, there are no articles that exhibit a purely negative insight. The findings suggest a general trend towards a balanced or nuanced perspective on blended mobile learning, with a considerable portion of the articles containing elements of both positive and negative perception.

Furthermore, in terms of regional reflection, developing countries show the highest percentage of positive perception, 70.73%, with developed nations following at 19.51% and cross-country at 4.88%. Interestingly, no region focuses solely on the negative perception of blended mobile learning. Additionally, mixed insights, which contain both positive and negative emotions, are more prevalent in developing nations, 46.34%, compared to both developed and cross-country nations, 24.39%. **Table 1** offers additional insights into the regional perception breakdown.

3.3. Overview of EFL Blended Mobile Learning

The integration of mobile learning into EFL blended learning highlights key attributes such as flexibility, engagement, and interactivity, which are among the most emphasized features in the reviewed studies. Flexibility enables learners to tailor their pace and schedules, making learning accessible at any time and from anywhere [27–36]. The accessibility enhances students' self-regulation, allowing them to take control of their learning progress [37]. Engagement and interactivity are enhanced through multimedia resources and real-time feedback, fostering active participation and motivation [38–44]. Mobile learning is also recognized for its convenience [45–47]. It enables students to integrate learning into their daily lives, and its effectiveness in improving retention and language acquisition has been demonstrated [33, 46, 48]. Further, it improves learning by offering features tailored to each individual and allowing for adjustments as needed [39, 46]. Although not always the primary focus, factors such as collaboration, critical thinking, and comprehensiveness can foster communication, problem-solving, and overall language development [48, 49]. **Figure 3** illustrates the main features and benefits of mobile learning integration in EFL blended learning contexts, as synthesized from the reviewed studies.

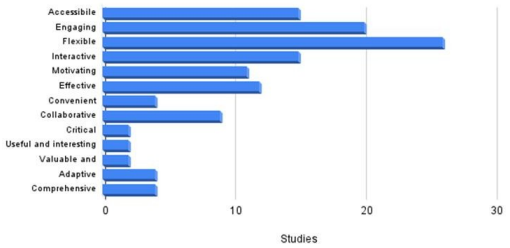

Figure 3. Overview of EFL blended mobile learning chart.

Furthermore, in the context of EFL education, the integration of mobile learning within a blended environment is changing how language skills are taught and learned. The alignment of curriculum with mobile learning technologies promotes learner-centered [27, 36]. It improves skills such as reading and listening comprehension, vocabulary acquisition, and grammar learning [35, 38, 45, 50, 51]. With features that adjust to each student's needs, mobile learning provides instant feedback and opportunities for practicing skills [30, 40, 48, 52]. Additionally, EFL blended mobile learning accommodates the diversity of learning styles and supports student auton-

Table 1. Blended mobile learning research reveals perception patterns.

Criteria	Sub Criteria	Ref.	Frequency
Perception	Positive	1,3,4,6,9,10,20,24,27,37	10
	Negative	-	0
	Positive and Negative	2,5,7,8,23,11,13,14,15,16,17,18,19,21,22,23,25,26,28,29,30,31, 32,33,35,36,38,39,40,41	29
	Neutral	12,34	2

omy[46, 47, 53]. By combining traditional face-to-face methods with modern mobile learning, the blend makes an enriched learning experience that boosts student engagement and fosters positive attitudes toward language learning[54, 55]. This integration not only bridges the gap between conventional and modern pedagogies but also supports the 21st-century demands of language proficiency[27, 38].

Moreover, mobile learning in blended methods offers a sustainable environment for EFL learners, where diverse models and media are effectively integrated[28, 54]. The use of different platforms and tools creates a more inclusive and complete learning experience that supports both the mental and emotional aspects of learning[52, 53]. Ultimately, mobile learning in blended EFL environments not only helps academic growth and motivation but also makes language learning a convenient and enjoyable experience, thereby enhancing the overall learning process[29, 48].

3.4. Types of Mobile Learning Tools Used in EFL

The integration of mobile learning tools in EFL is comprehensive and inclusive, as many tools can be utilized in various ways, demonstrating their potential for improving language learning[56, 57]. Mobile devices, such as smartphones, tablets, and MP3/MP4 players, provide the foundational hardware that enables access to various tools[27, 40, 52, 58]. Meanwhile, mobile applications such as Duolingo, Quizlet, and Rosetta Stone offer specific skills for improving reading, speaking, listening, and vocabulary[29, 59]. These apps often complement multimedia tools by providing interactive exercises, videos, and audio content to promote engagement and comprehension[46, 48, 57]. Digital platforms like YouTube, Zoom, Google Classroom, WhatsApp, and News in Levels encourage collaboration, resource sharing, and skill improvement. It also easily links learning that occurs when everyone is online simultaneously with learning that happens at different times[38, 60, 61]. Similarly, learning management systems (LMSs) like Moodle and Blackboard provide structured environments for managing courses while incorporating multimedia elements such as interactive activities and monitoring student progress[47, 54, 62]. Table 2 presents a summary of the most commonly used mobile tools in EFL blended learning with their functions and categories, as identified in the reviewed studies. This finding aligns with the adaptability of tools like Duolingo, which serve as mobile apps, multimedia resources, and key components of larger digital platforms, providing an extensive and integrated approach to EFL learning.

3.5. Impact of Mobile Learning on Language Skills

Based on **Figure 4**, the impact of mobile learning on various language skills can be classified as follows: listening, reading, speaking, and writing. They demonstrate substantial improvements with a higher number of studies supporting these skills. Listening and reading are among the most prominent receptive skills[22, 30, 39, 48, 52, 56]. They are often enhanced through interactive audio, video content, and digital texts that provide authentic and engaging material[29, 37, 49]. Similarly, speaking and writing, as productive skills, benefit from interactive tools, voice recording apps, and feedback mechanisms that foster active participation and skill development[22, 44, 57]. However, skills such as viewing and presenting receive relatively limited attention, with few studies addressing their development through mobile-assisted tools, suggesting a gap for future exploration[32, 43, 63]. Overall, mobile learning's flexibility, accessibility, and interactivity provide a robust platform for enhancing receptive and productive skills; however, its potential for skills such as viewing and presenting remains underutilized.

Table 2. Category and tools of EFL blended mobile learning.

Category	Tools
Mobile Devices	Smartphones, iPods, Tablets, MP3/MP4 Players
Mobile Apps	Angličtina Today, Memrise, Duolingo, Quizlet, Cambly, Busuu, Rosetta Stone, FunEasyLearn, LingQ, Italki, Voki, Quizizz, Virlenda, Canvas, Wordwall, Kahoot
Digital Platforms	News in Levels, Breaking News English, Tween Tribune, Telegram, YouTube, TED, Zoom, Google Meet, Webex, Google Classroom, Line, Messenger, WhatsApp, WeChat, Edmodo, Microsoft Teams
LearningManagement Systems (LMS)	Schoology, Moodle, Blackboard, Rain Classroom, Blue Ink Cloud Class
Multimedia Tools	Audio, Video, Interactive Exercises

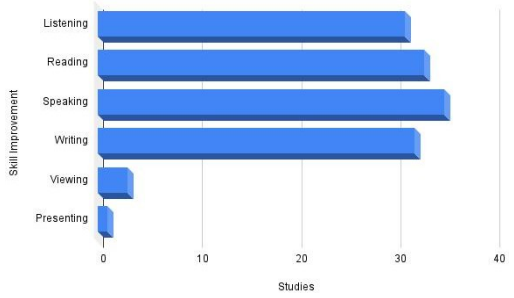

Figure 4. Overview of mobile learning impact on language skills chart.

3.6. Student Engagement and Motivation

Mobile learning significantly enhances student motivation and engagement in blended learning environments by offering flexibility, personalization, and interactivity, all of which cater to diverse learning needs and preferences[39, 53, 58]. The ability to access materials anytime and anywhere supports self-paced and independent learning, fostering a sense of autonomy and making the learning experience more convenient and enjoyable[41, 48, 52]. Interactive tools, such as Kahoot, Voki, and Edmodo, along with multimedia features like videos, quizzes, and gamified elements, sustain student interest, promote active participation, and create a more engaging learning environment[29, 38, 40]. EFL blended mobile learning further supports skill development, particularly in vocabulary, listening, speaking, and reading comprehension, while boosting students' confidence in ICT self-efficacy[27, 45, 61]. Collaborative opportunities provided by platforms enhance peer interaction and communication, thereby improving classroom dynamics and fostering a more engaging and positive learning environment[35, 39, 56, 58, 60].

3.7. Instructor's Perspectives on Mobile Learning

Instructors generally perceive mobile learning as a valuable tool for enhancing student engagement, promoting autonomy, and improving learning outcomes[54, 57, 60]. They appreciate its flexibility and interactivity, but face challenges in adapting to its full potential due to technical issues, insufficient training, and limited infrastructure[22, 40, 48]. Effective integration requires instructors to align mobile technologies with learning objectives and develop engaging, student-centred lessons[27, 49]. Training and professional development play a critical role in enhancing instructors' ICT skills, self-efficacy, and readiness to adopt M-learning[37]. With adequate preparation, instructors can leverage mobile learning to create engaging and effective blended learning environments[35, 55].

RQ2. What challenges and opportunities arise when adapting mobile learning to enhance English language skills in blended learning environments?

3.8. Challenges in Adapting EFL Blended Mobile Learning

The integration of mobile learning into EFL blended learning presents several technical challenges that can compromise its effectiveness and accessibility. Limited access to technology, particularly in isolated areas, creates disparities among learners who lack supported facilities[33, 64, 65]. Additionally, internet connectivity, characterized by slow speeds, unstable connections, and high costs, makes it difficult for students to engage in online learning activities and access educational resources[36, 37, 57]. These technical problems

are getting worse due to device compatibility issues. For instance, some LMSs and applications may not perform well on older devices or those with limited capabilities, leading to inconsistent user experiences [44, 63].

Another big challenge is the different levels of technical proficiency among students and teachers. Teachers often need specialized training to teach effectively with mobile devices, while some students may struggle with using digital platforms [40, 51, 56]. Furthermore, it is challenging to find the right balance between mobile learning and in-person teaching, as students may prefer to engage in certain activities, such as speaking or group discussions, in person [22, 44]. Focusing too much on mobile learning could harm the value of in-person interaction, which is essential for learning how to communicate effectively and understand different cultures [29, 33]. Distractions from social media and unfamiliar vocabulary on mobile platforms also hinder the learning process, particularly for beginner learners [36, 58].

3.9. Student-Related Challenges

Students who implement mobile-supported blended learning often face significant challenges related to digital literacy skills, time management, and a lack of self-discipline [46, 56, 66]. Many students lack the technical skills necessary to use mobile learning platforms effectively. They have trouble using tools such as LMSs and online resources [42, 60]. These issues are integrated by poor internet connectivity and limited access to devices [61, 64]. Additionally, EFL learners face difficulties in understanding non-native accents and using English-based app interfaces, which restrict their comprehension and interaction [52]. These digital literacy gaps not only reduce the efficiency of their learning but also increase passive participation in mobile-supported activities.

Furthermore, time management and self-discipline are also challenges in the learning process [34, 43, 55]. Students often struggle to find a good balance between their schoolwork and other responsibilities, which can lead to procrastination and missed deadlines [31, 42]. Online distractions, such as social media, worsen this problem, making it challenging to stay focused during learning sessions [52, 66]. Moreover, mobile learning requires a great deal of self-discipline, as students work more independently; however, many students lack the self-control necessary for this approach [55].

3.10. Opportunities for Enhanced Language Learning Proficiency and Skill Development

M-learning gives transformative opportunities for enhancing language proficiency and skill development in EFL blended learning environments [67]. Its flexibility and accessibility allow learners to engage in self-paced, personalized learning at any time and from anywhere, accommodating diverse schedules and preferences [27, 39, 47, 57]. This adaptability encourages students to learn at their own pace, revisit materials as needed, and maintain consistent engagement throughout the learning process. Moreover, interactive features such as gamified exercises, multimedia content, and collaborative activities make learning more engaging and enjoyable, helping students think more deeply and retain what they learn better [30, 44, 45]. By providing instant feedback and adjusting content, mobile learning platforms enhance motivation and boost self-efficacy [33, 43, 45, 51]. It also helps students continuously improve their reading, vocabulary, writing, and speaking skills [37, 42, 44, 59].

In addition to improving language proficiency, mobile learning bridges the gap between theoretical knowledge and practical language application in the real world. Methods such as simulations, role-playing exercises, and global communication platforms prepare students for practical language use in academic and professional contexts [29, 55, 62]. This approach also promotes autonomy and lifelong learning. It motivates students to take control of their knowledge and explore topics that extend beyond the regular curriculum [36, 46, 51].

4. Conclusions

This review responds to the growing interest among practitioners, educators, and EFL teachers in the use of blended mobile learning. This SLR highlights the significance of mobile learning in enhancing EFL blended learning. It offers flexibility, engagement, and involvement. These characteristics create independent, learner-centered settings that improve abilities such as reading comprehension, speaking fluency, and vocabulary acquisition while blending conventional teaching techniques with modern pedagogical approaches. Nevertheless, obstacles still exist despite this revolutionary potential, such as technological difficulties, defi-

ciencies in digital literacy, and the constant need to balance online and in-person instruction. According to the reviewed studies, perspectives on mobile learning vary across global contexts, reflecting a nuanced understanding of both its advantages and disadvantages; however, developing regions tend to hold the most favorable opinions. Furthermore, the adaptability of mobile learning resources, such as collaborative platforms and multimedia applications, enhances the cognitive and affective components of language learning. Although some areas, such as the improvement of viewing and presenting abilities, have been acknowledged, they remain underexplored in the current literature.

A comprehensive, multifaceted approach is required to address these challenges. To ensure fair access for all students, infrastructure must be improved by offering dependable internet connectivity and reasonably priced devices. Additionally, to enable educators to integrate mobile learning into their teaching practices successfully, thorough teacher training and continuous technical assistance are essential. The literature suggests that balancing mobile and in-person activities may support improved learning outcomes while tailoring content for compatibility with a variety of devices. To help students overcome motivational obstacles and maximize the benefits of mobile-supported blended learning, targeted interventions such as time management tools, digital literacy training, and discipline-promoting systems are essential. By fostering an integrated environment where mobile tools complement face-to-face instruction, mobile learning can transform language education. It prepares learners with the confidence, competence, and skills needed for real-world communication. Future research should focus on exploring sustainable solutions to technical challenges, refining the development of underexplored skills, and assessing the long-term impact of mobile learning on learner autonomy and motivation to enhance its application in EFL further blended learning contexts.

Author Contributions

Conceptualization, I.W. and S.H.; methodology, A.T.; software, E.S.; validation, S.H. and A.T.; formal analysis, I.W. and M.A.; investigation, E.S.; resources, M.A.; data curation, D.M.; writing—original draft preparation, I.W.; writing—review and editing, Y.S.G.T. and H.; visualization, I.W.; supervision, S.H. and A.T.; project administration, I.W. All authors have read and agreed to the published version of the manuscript.

Funding

This writing and publication of this article were supported in fund by the Indonesian Education Scholarship (BPI), the Center for Higher Education Funding and Assessment (PPAPT), the Ministry of Higher Education, Science, and Technology of the Republic of Indonesia, and the *Lembaga Pengelola Dana Pendidikan* (LPDP) - Indonesian Endowment Fund for Education.

Institutional Review Board Statement

Not applicable.

Informed Consent Statement

Not applicable.

Data Availability Statement

The authors affirm that all data produced and examined in this research are fully presented within this article.

Conflicts of Interest

The authors declare no conflicts of interest.

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