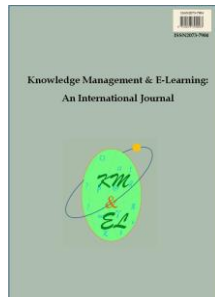

The acceptance, readiness, affordances, and challenges of mobile-assisted language learning: A systematic literature review

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Knowledge Management & E-Learning: An International Journal (KM&EL)
ISSN 2073-7904

Recommended citation:

Fang, J. (2025). The acceptance, readiness, affordances, and challenges of mobile-assisted language learning: A systematic literature review. *Knowledge Management & E-Learning*, 17(2), 240–257.
<https://doi.org/10.34105/j.kmel.2025.17.011>

The acceptance, readiness, affordances, and challenges of mobile-assisted language learning: A systematic literature review

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Abstract: Although mobile technologies are commonly used to support language learning, there is a lack of research to comprehensively determine the acceptance, readiness, affordances, and challenges in this area. To address this gap, this systematic literature review selected 49 articles indexed in the Scopus database between 2013 and 2022. This study found that TAM and UTAUT are the two most used models to examine the acceptance and readiness of MALL users. Besides, respondents generally have a positive acceptance and readiness for MALL, and they have sufficient knowledge and experience with MALL. This research classified three categories of the affordances of MALL, namely technology-based affordances which are related to the variety and application of mobile apps and the enhancing features of multimedia, the functional affordances of MALL which are related to the dynamic and flexible learning environments and the accessibility of mobile devices, and various aspects of language learning-based affordances. Regarding the challenges of MALL, this study has found that infrastructural and technological challenges, e.g. the insufficient ownership and accessibility of mobile devices, the limitations of mobile devices, the shortcomings of user interface and the instructional design of mobile apps, user-related issues, e.g., lack of technical and language skills, and application concerns, e.g. pedagogical concerns, health, privacy, and security concerns, and other real-world application concern could affect respondents' acceptance and readiness of MALL. Both practical and theoretical implications are highlighted in this research.

Keywords: Systematic literature review; Mobile assisted language learning; Acceptance/readiness; Affordance; Challenge

Biographical notes: Dr. Jie Fang received her Ph.D. degree from the University of Malaya, Malaysia in 2023. She received her MA degree from Beijing Foreign Studies University, China in 2017. She has written seven academic articles on mobile-assisted CSL learning. Four articles have been published. Two articles have been accepted. Another article is in the revision process. Five of her articles (in Chinese) have been published in a book on intercultural communication cases and analysis.

1. Introduction

In non-native language environments, learners taught with traditional teaching methods do not have enough opportunities to practice languages after class because traditional learning systems do not provide dynamic content for individual learners, and cannot meet learners' preferences and the requirements of the specific learning context (Maqsood et al., 2020). Mobile devices such as smartphones and tablets were actively used by respondents for various purposes. Comparatively speaking, the use of mobile technologies, such as mobile apps, is more useful and effective for transitioning from teacher-directed learning to learner-directed learning (Habib et al., 2022).

With the rapid development of mobile technologies and wireless networks, mobile device ownership is increasing, and m-learning has become even more widespread in recent decades (Huang et al., 2021; Zhang & Pérez-Paredes, 2021). Moreover, individuals from Generation Z, typically born between 1997 and 2012, commonly own personal mobile devices through which they access the internet and engage extensively with social media platforms (Criollo-C et al., 2021). Due to the well-known advantages of mobile technologies, such as availability, mobility, flexibility, accessibility, variety, and fun, they are universally used in various disciplines to improve the teaching effect, including the improvement of language learning, i.e., mobile-assisted language learning (MALL) (Almadhady et al., 2020; Hoi, 2020; Hsu & Lin, 2022).

Since the success of MALL depends on learners' mobile acceptance (Hsu & Lin, 2022), a systematic literature review was conducted to identify the state and research trends regarding the acceptance, readiness, affordances, and challenges of MALL. As some previous reviews have summarized many studies have used the technology acceptance model (TAM) and the unified theory of acceptance and use of technology (UTAUT) to investigate users' readiness and acceptance, which aims to predict their behavioral intention and actual use of MALL (Alghazi et al., 2020), neglecting the other relative variables, in this literature review, besides the variables that are commonly used in these two most popular theories and models, the other variables that are mainly related to users' characteristics have been summarized.

In addition, most studies focused on selecting students, especially higher education students, as respondents to investigate mobile acceptance and readiness (Granić, 2022; Metruk, 2022). Moreover, some previous literature reviews, such as Zain and Bowles (2021) and Metruk (2022), only examined articles on ESL/EFL. To obtain a more comprehensive picture of the acceptance and readiness of MALL users, this literature review included other populations such as teachers, parents, and younger students as respondents. Apart from ESL/EFL learners, other language learners were also included. Besides, users' MALL skills and experience were also reviewed since they are related to mobile acceptance and readiness.

Furthermore, as reported in previous literature reviews, e.g. Zain and Bowles (2021), most studies have found that mobile technologies have plenty of affordances. For example, they can improve learners' language proficiency, enhance learners' retention and metacognitive skills, create positive learner perceptions/attitudes/motivation toward MALL, and provide collaborative learning and other learning opportunities. However, some affordances have been neglected. The current literature review contributes to comprehensively addressing more affordances of MALL by referring to the 49 remaining articles.

Moreover, as pointed out by some previous studies, the challenges and barriers of MALL should be explored (Deris & Shukor, 2019; Lin et al., 2022; Lukas & Yunus, 2021). Because these problems can lead to unpleasant learning experiences, additional learning anxiety, and cognitive load (Zain & Bowles, 2021). However, Metruk (2022) stated that most studies focused on demonstrating the affordances of MALL and underestimated the challenges. Specifically, almost one-third of the studies did not mention the challenges of MALL. Therefore, apart from the affordances of MALL, the challenges of MALL are also considered in this literature review.

To summarize, this systematic literature review significantly expands the scope of research on mobile-assisted language learning (MALL) by including a wide range of languages and demographic profiles, including learners, teachers, parents, etc. In contrast to previous studies that focused predominantly on ESL/EFL contexts, this review extends to other language learning environments, enhancing our understanding of the varied acceptance and readiness of MALL across different groups. In addition, this review explores both the affordances and challenges of MALL to address critical gaps in current research. By selecting articles from the last decade (from 2013 to 2022) in the Scopus-indexed database, this review ensures a comprehensive and timely analysis that provides solid insights into the evolving dynamics of MALL. These contributions are important to the development of more effective and inclusive MALL strategies that meet the differentiated needs of today's learners.

The research questions are as follows:

RQ1: What is the level of acceptance and readiness of MALL users based on the articles reviewed?

RQ1.1: What are the most used theories, models, and relative variables regarding the acceptance and readiness of MALL users?

RQ1.2: What is the level of acceptance and readiness of MALL users?

RQ1.3: What skills and experience do MALL users have?

RQ2: What are the affordances of MALL based on the articles reviewed?

RQ3: What are the challenges of MALL based on the articles reviewed?

2. Method

Systematic literature review is used because it follows the set protocols and predetermined criteria to search, evaluate, synthesize, analyze, and report the previous research findings on a particular topic so that it is effective in evaluating the existing research and discovering the gaps and trends for future research (Mengist et al., 2020). To explore the acceptance, readiness, affordances, and challenges of MALL, similar to Granić (2022), the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-analyses) protocol is followed to reduce bias and increase the reliability and transparency of the review.

2.1. Search strategy

Similar to Metruk (2022), the articles involved in this review were selected from the Scopus database, as journals in this database typically use rigorous peer-review procedures to vet manuscripts submitted to them and ensure a relatively high level of quality. The search was

conducted on July 11, 2023, by including the article title, abstract, and keywords. The search terms were (mobile readiness) OR (mobile acceptance) AND (language). To narrow down the search scope, a basic filtering process was performed by following the inclusion and exclusion criteria such as the period between 2013 and 2022, the written language is English, and only academic articles are considered. The necessary information about the articles such as title, author, abstract, journal, etc. was exported to Excel spreadsheets for further review.

2.2. Inclusion and exclusion criteria

To decide which articles could be included in this review, pre-determined inclusion and exclusion criteria were established. In general, studies should have been conducted between 2013 and 2022 and written in English, meaning that studies not published during this period and studies written in other languages were excluded. Studies should relate to the acceptance and readiness of mobile technologies in a language learning context, which means that other types of technologies, such as computer-assisted language learning, are excluded. In addition, studies of mobile technologies used in domains other than language learning were excluded. Furthermore, only studies that underwent rigorous peer review and used empirical data to support the research findings were included. Therefore, other types of studies such as conference proceedings, reviews, book chapters, editorials, commentaries, application development, theoretical discussions, theses, and dissertations were not considered.

2.3. Data collecting and filtering process

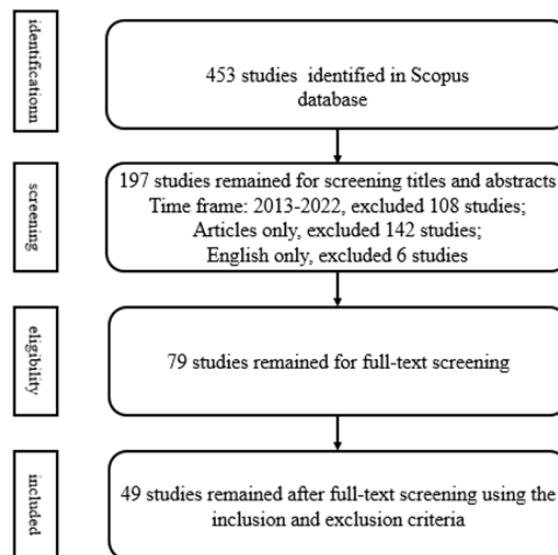


Fig. 1. Database searching process and the results

According to the search terms, 453 studies were identified in the Scopus database. As shown in Fig. 1, 108 studies were not published between 2013 and 2022, 142 studies that were not supported by empirical data, and six studies that were not written in English.

Therefore, only 197 studies remained for the next step of the screening process. After screening the titles and abstracts of these studies based on the inclusion and exclusion criteria, 79 studies remained for full-text screening. Finally, the 49 articles that satisfied the criteria and were publicly available were included in this systematic literature review.

2.4. Coding schemes and data extraction

A rigorous process was followed in developing the coding schemes by closely aligning them with the research questions to ensure comprehensive coverage of the relevant topics. The coding schemes were developed in an iterative process that included both deductive and inductive strategies. For deductive coding, broad categories were established based on the research questions, including acceptance, readiness, affordances, and challenges of MALL. These categories were defined prior to analysing the content to provide a structured framework for data extraction. Regarding inductive coding, additional subcategories emerged from the data as the articles were reviewed, leading to a refinement of the initial coding schemes. This flexible approach allowed for a deeper insight into the research topics.

During data extraction, each article was carefully reviewed by the author. The research methods, results, conclusions, and limitations were extracted and classified using a structured data extraction form in case any details might be overlooked. The process of coding schemes and this structured form ensured, to a certain extent, the reliability of the research.

2.5. Data analysis

In this systematic literature review, the most important method of data analysis is thematic/content analysis. Specifically, the information in the 49 articles was categorized into several predetermined themes according to the research questions, coding schemes, and thematic similarities of the findings to obtain an overall picture and a deeper understanding of the previous research.

3. Research findings

The research findings were divided into several subsections according to the research questions, which are explained in more detail below.

3.1. Acceptance and readiness of MALL users

This literature review examines the acceptance and readiness of MALL users in three aspects, namely the most used theories, models, and relative variables, the level of acceptance and readiness of MALL users, and users' MALL skills and experience, which are elaborated following.

3.1.1. The most used theories, models, and relative variables

The Technology Acceptance Model (TAM) ($N = 24$) and the Unified Theory of Acceptance and Use Technology (UTAUT) ($N = 11$) were the two most used models to examine users' acceptance and readiness of MALL. Among them, 21 articles concluded that the majority

of respondents have moderate or high levels of perceived usefulness (PU), perceived ease of use (PEOU), attitudes, and behavioral intention for MALL (Almadhady et al., 2020; Andujar et al., 2020; Bojórquez et al., 2016; Chen & Zhao, 2022; Cheung, 2015; Chiu & Churchill, 2016; Criollo-C et al., 2021; Deris & Shukor, 2019; Dillon & Wells, 2021; Habib et al., 2022; Haghighi et al., 2019; Hashim et al., 2016; Hoi & Mu, 2021; Hsu, 2017; Lin et al., 2022; Maqsood et al., 2020; Mei & Yang, 2019; Nami, 2020; Syarifudin & Suharjito, 2020; Wang & Hsu, 2020; Wong et al., 2015). Besides, at least 2 articles (García Botero et al., 2018; Mussa & Sazalli, 2021) reported that respondents generally had moderate levels of performance expectancy, effort expectancy, social influence, and facilitating. According to previous research, these variables could have a positive influence on respondents' intention to use MALL.

In addition to the frequently used variables in TAM and UTAUT, 8 articles (Botero et al., 2018; Hashim et al., 2016; Hsu & Lin, 2022; Kaur et al., 2021; Lin et al., 2022; O'Neill et al., 2018; Putra et al., 2020; Zhang & Yu, 2022) have included other variables such as gender, age, mobile app design, teaching/learning experience with mobile devices, the field of study, daily usage duration, educational background/degree, academic title, and learning preferences in their studies, suggesting that these variables may have an impact on behavioral intentions. For example, learners who are more familiar with mobile technologies and use mobile phones more frequently are more likely to be willing and feel less pressured at MALL (O'Neill et al., 2018).

3.1.2. *Level of acceptance and readiness of MALL users*

In general, at least 9 articles mentioned that respondents believe that it is convenient, fair, fun, flexible, interactive, entertaining, comfortable, practical, effective, and efficient to improve language skills, take tests, exchange information and knowledge, complete tasks, receive feedback, and get better work opportunities via MALL (Berns et al., 2016; Botero et al., 2018; Cheung, 2015; Dillon & Wells, 2021; Habib et al., 2022; Nasir et al., 2021; Önal et al., 2019; See et al., 2019; Shuib et al., 2018). Specifically speaking, some respondents are motivated and eager to engage in MALL anytime and anywhere to improve various types of language skills. Some respondents prefer to use mobile devices outside the classroom rather than using them in the classroom (Botero et al., 2018; Dillon & Wells, 2021; Habib et al., 2022). When some respondents achieve more meaningful and useful outcomes, they tend to engage in MALL more frequently and persistently (Chen & Zhao, 2022).

In summary, some researchers, such as Haghighi et al. (2019), Hsu (2017), Lin et al. (2022), See et al. (2019), Shuib et al. (2018), Syarifudin and Suharjito (2020) concluded that respondents, including teachers, learners, and parents, etc., have a positive acceptance and readiness for MALL. They intend to actually use it instead of just considering it as an opportunity (Hashim et al., 2016). Students are not only more attracted to and active in online learning (Lukas & Yunus, 2021), but also want to stay engaged and recommend it to others on MALL (Berns et al., 2016; Deris & Shukor, 2019; Haghighi et al., 2019; Hsu, 2017; Wang & Hsu, 2020; Zhang & Pérez-Paredes, 2021). They believe that mobile technologies can be used as complementary tools to improve learning effectiveness (Rafiq et al., 2022; Shuib et al., 2018), in the areas of face-to-face learning, distance learning, blended learning, flipped learning, and gamification-based learning (Granić, 2022; Haghighi et al., 2019; Hawamdeh & Soykan, 2021; Hsieh et al., 2017).

3.1.3. Users' MALL skills and experience

There are 18 articles, namely Almadhady et al. (2020), Ali and Deris (2019), Arif et al. (2022), Botero et al. (2018), Chen and Zhao (2022), Cheung (2015), Chiu and Churchill (2016), Criollo-C et al. (2021), Dillon and Wells (2021), Habib et al. (2022), Haghighi et al. (2019), Hoi (2020), Hsu and Lin (2022), Jung (2015), Lukas and Yunus (2021), Mei and Yang (2019), Nami (2020), and Nasir et al. (2021), which indicate that the respondents have sufficient knowledge of information and communication technology (ICT) and active experience with various types of mobile apps, such as social media (e.g. dictionary-based apps and Google Translate) to communicate with others, engage in online learning, access services, expand vocabulary with electronic dictionaries, search for answers on the Internet, promote learners' language skills and sense of responsibility, and use mobile games to teach/learn languages.

In 2 articles, namely Andujar et al. (2020) and Hashim et al. (2016), it was pointed out that the respondents have control over MALL and felt almost no difficulties with MALL. In this context, 3 studies (Andujar et al., 2020; Haghighi et al., 2019; Hsieh et al., 2017) have even combined MALL with blended learning and flipped learning contexts to learn languages inside and outside the classroom. In general, users' sufficient MALL skills and experience contributed significantly to their mobile acceptance/readiness.

3.2. Affordances of MALL

In reviewing the 49 articles, this research classified the affordances of MALL into four categories, namely technology-based affordances of MALL, functional affordances of MALL, language learning-based affordances of MALL, and psychological affordances of MALL. The details are displayed as follows.

3.2.1. Technology-based affordances of MALL

The technology-based affordances are related to the variety and application of mobile apps and the enhancing features of multimedia. First, various types of mobile apps are used to facilitate language learning. For example, some researchers report that translation-based, dictionary-based, and lexical apps are the most used mobile apps (Botero et al., 2018; Nami, 2020). In addition, other mobile apps such as WhatsApp, Google Classroom, Quizzes and Zoom (Lukas & Yunus, 2021), gamification apps, word lists, tests/quizzes, and media (Chen & Zhao, 2022; Deris & Shukor, 2019), and e-books are also commonly used to facilitate various types of language learning/teaching activities. For example, Lukas and Yunus (2021) reported that teachers used WhatsApp to conduct online teaching during COVID-19.

Second, the multimedia elements such as images, texts, audiovisual materials, animations, and games displayed in the mobile app can be used to improve language skills (Almadhady et al., 2020; Ali & Deris, 2019; Hsieh et al. 2017; Rafiq et al., 2022; Wang & Hsu, 2020). In addition, features such as colors and shapes of mobile apps (Purgina et al., 2019), time limits, role-playing, scoring systems, and learning levels of mobile games (Berns et al., 2016), a user-friendly interface, and various learning activities (Hsu & Lin, 2022; Wang & Hsu, 2020) also make it easier to teach and learn languages and enable learners to engage in repetitive, sustained, systematic, and visual learning (Önal et al., 2019). As reported by Haghighi et al. (2019), respondents enjoy learning with multimedia, such as watching videos and visiting websites. Similarly, See et al. (2019) found that

parents recognize that multimedia can help capture learners' attention and enhance learners' story comprehension.

3.2.2. *Functional affordances of MALL*

The functional affordances of MALL are related to the dynamic and flexible learning environments and the accessibility of mobile devices. First, mobile technologies could provide a competitive, fun, interactive, and economical learning environment (Ozer & Kiliç, 2018; Ali & Deris, 2019), so they can connect the target language with an authentic environment (Mei & Yang, 2019), connect formal and informal learning (Wong et al., 2015), connect individual and social learning (Wong et al., 2015), and connect the real world with classroom learning (Berns et al., 2016). In this scenario, respondents can receive up-to-date information in real-time (Almadhady et al., 2020). As reported by Hsieh et al. (2017), flipped learning with Line provides learners with a more stimulating and realistic context for learning English. Learners are more motivated because they can preview and gain a deeper understanding of classroom learning before class (Hsieh et al., 2017) and complete homework in class via Telegram (Haghighi et al., 2019).

Second, due to the convenience and mobility of mobile devices, learners have access to learning content and activities anytime and anywhere, such as at home, at the dining place, on the go, at school, etc. (Berns et al., 2016; Cheung, 2015; Haghighi et al., 2019; Hsieh et al., 2017; Macedonia et al., 2014; Maqsood et al., 2020; Ozer & Kiliç, 2018; See et al., 2019; Wang & Hsu, 2020) so that they can learn across spaces (Wong et al., 2015) and learn independently, even without teacher support (Almadhady et al., 2020; Önal et al., 2019; Zhang & Pérez-Paredes, 2021). For example, Macedonia et al. (2014) found that both adults and children consider the intelligent virtual agent as a human trainer and helpful virtual teacher to improve vocabulary learning anytime and anywhere.

3.2.3. *Language learning-based affordances of MALL*

The language learning-based affordances of MALL are separated into three aspects. First, mobile technologies enable interaction and collaboration among learners, teachers, peers, and parents (See et al., 2019). In this case, learners have more opportunities to engage in collaborative learning, group learning, scenario-based learning, self-directed learning, situated learning, active learning, and interactive learning activities (Cheung, 2015; Hsieh et al., 2017; Mei & Yang, 2019; Wang & Hsu, 2020). They can also communicate, learn, and share information with their peers through technology and receive personalized, tailored, engaging, and meaningful learning experiences, so they actively and regularly engage on MALL and intend to participate in similar learning activities (Berns et al., 2016; Cheung, 2015; Hsieh et al., 2017; Mei & Yang, 2019; Zhang & Pérez-Paredes, 2021). For example, Zhang and Pérez-Paredes (2021) concluded that respondents not only recognized the benefits of sharing information, but also were motivated by their classmates' achievement, so they put more effort into learning English. Learners' confidence and motivation in communicating with their classmates were also increased (Hsieh et al., 2017).

Second, mobile apps can be used to improve various types of language skills and academic performance, including pronunciation, listening comprehension, grammar, writing, speaking, and reading skills through communication with the real world (Almadhady et al., 2020; Ali & Deris, 2019; Berns et al., 2016; Cheung, 2015; Habib et al., 2022; Hsieh et al., 2017; Maqsood et al., 2020; Nami, 2020; Ozer & Kiliç, 2018; Syarifudin

& Suharjito, 2020; Zhang & Pérez-Paredes, 2021). Thus, respondents use mobile apps not only to facilitate ESL learning but also to learn other languages, including endangered and indigenous languages such as Kichwa (Criollo-C et al., 2021) and Mayo (Bojórquez et al., 2016). This is because it could provide learners with more opportunities to engage in multilingual learning contexts and is useful in facilitating the learning of multiple languages (See et al., 2019). However, the effectiveness of MALL, especially for vocabulary learning, usually becomes noticeable only after a certain period of continuous use (Chen & Zhao, 2022).

Third, mobile technologies can be used for a variety of other purposes related to language learning. For example, they can be used to provide individual learners with scaffolding (Ali & Deris, 2019), monitor their learning progress (Berns et al., 2016; Hsieh et al., 2017), improve their skills and abilities (Macedonia et al., 2014), develop their critical thinking skills and broaden their perspective (Mei & Yang, 2019), provide immediate, delayed, and ongoing feedback (Berns et al., 2016; Hsieh et al., 2017; Purgina et al., 2019), to improve learning quality (Önal et al., 2019) and long-term memory (Macedonia et al., 2014; Ozer & Kiliç, 2018), to pass exams (Zhang & Pérez-Paredes, 2021), and to communicate privately (Berns et al., 2016).

3.2.4. *Psychological affordances of MALL*

Other than the above-mentioned affordances of MALL, mobile technologies can also be used to reduce some negative feelings and experiences. For example, by engaging in MALL, some negative feelings of respondents, such as anxiety, tension, frustration, discomfort, isolation, shyness, and fear have been reduced. In this case, they can learn more easily, interact with classmates and teachers without stress, and feel less nervous, embarrassed, and afraid of making mistakes (Berns et al., 2016; Chiu & Churchill, 2016; Day & Song, 2017; Haghighi et al., 2019; Hsieh et al., 2017; Macedonia et al., 2014; Önal et al., 2019). In addition, some researchers found that respondents exhibited low levels of uncertainty avoidance (Bojórquez et al., 2016) and lower cognitive load (Lukas & Yunus, 2021; Ozer & Kiliç, 2018).

3.3. *Challenges of MALL*

Based on 49 articles, this literature review comprehensively summarizes three types of challenges faced by MALL, namely infrastructural and technological challenges, user-related issues, and application concerns in the MALL context, which are explained in more detail below.

3.3.1. *Infrastructural and technological challenges*

First, it is about the insufficient ownership and accessibility of mobile devices. According to the 49 articles, although the majority of respondents own a mobile device, some respondents in developing countries, especially those from low-income families and those living in remote areas, do not have mobile devices (Ali & Deris, 2019; Botero et al., 2018; Lukas & Yunus, 2021; O'Neill et al., 2018), which makes it almost impossible for them to engage in MALL.

Second, it is about the limitations of mobile devices. For example, the small screen size of mobile devices makes it inconvenient for learners to read and learn during MALL

(Mei & Yang, 2019; Zhang & Pérez-Paredes, 2021). Besides, respondents also encounter some other problems, such as poor/weak battery, poor quality of headphones, limited speed of processor and operating system (Ozer & Kiliç, 2018), problems in using microphones (Dillon & Wells, 2021), lack of instant feedback (Hsu & Lin, 2022), and unexpected quitting of mobile apps (Mei & Yang, 2019), which might affect respondents' usage experience.

In addition, the successful implementation of MALL highly depends on the Wi-Fi signals or data plan of respondents' mobile devices, but not all respondents have an Internet data package (Criollo-C et al., 2021). Therefore, they have to obtain learning materials in the specific location and situation, which prevents them from taking full advantage of MALL (Ali & Deris, 2019; Andujar et al., 2020). Limited internet coverage and unstable internet connections also affect the display of app features and interrupt learning sessions (Deris & Shukor, 2019; Haghighi et al., 2019; Lukas & Yunus, 2021; Nasir et al., 2021; Ozer & Kiliç, 2018; Shuib et al., 2018).

Third, it is about the shortcomings of user interface and instructional design of mobile apps. For example, some mobile apps lack clear instructions and attractive user interface design and focus too much on tests/quizzes, which may not arouse learners' interest. Some games do not meet learners' needs, e.g. the game ends too quickly if learners give wrong answers, which reduces learners' motivation (Deris & Shukor, 2019). Some self-developed mobile apps, such as WordBricks, still have some bugs that need to be worked on (Purgina et al., 2019). The pronunciation produced by text-to-speech is robotic, not natural, incorrect, and fast (See et al., 2019). The complicated user interface design, boring repetitive learning content, and poor teaching style may cause learners to hesitate to use MALL or choose other mobile apps instead (Hsu & Lin, 2022). Some features and contents of mobile apps should be purchased (Deris & Shukor, 2019; Ozer & Kiliç, 2018), which might affect the usage rate, as some respondents would like to use free mobile apps (Zhang & Pérez-Paredes, 2021).

3.3.2. *User-related issues*

There are some user-related issues. Concerning this issue, although the majority of respondents display optimistic feelings about MALL, they still suffer from anxiety, insecurity, and discomfort (Haghighi et al., 2019; Shuib et al., 2018). Some of the respondents tend to engage in passive learning rather than active collaborative learning (Mei & Yang, 2019), show shyness and reluctance in learning English and speak in public (Rafiq et al., 2022), prefer to read printed materials (See et al., 2019), or prefer to learn face-to-face with teachers rather than MALL (Hsu & Lin, 2022). Some young students rely heavily on their parents' mobile devices and guidance from others while engaging in online learning because they are used to face-to-face interaction with teachers. Without guidance and supervision, they may feel demotivated (Lukas & Yunus, 2021). Some respondents are addicted to mobile technologies (Ozer & Kiliç, 2018) and do not have specific learning plans (Botero et al., 2018).

Besides, some respondents lack technical skills. For example, some of the respondents have difficulty selecting good and appropriate mobile apps that meet the needs of the respondents at different stages of learning (Berns et al., 2016; Zhang & Pérez-Paredes, 2021), do not have actual MALL experience (Hashim et al., 2016), and lack MALL skills (Nasir et al., 2021). Some of them even do not receive any MALL training or instruction (Botero et al., 2018).

In addition, some respondents do not have sufficient language skills. For example, some respondents think that some words are difficult and unfamiliar (Deris & Shukor, 2019; Nasir et al., 2021). Some respondents have problems in learning English, especially grammar and vocabulary (Rafiq et al., 2022). See et al. (2019) found that the multilingual features of the eBook confuse children. Therefore, some children lack the motivation to read in other languages.

3.3.3. Application concerns

First, there are some pedagogical concerns of MALL. As for teachers, some of them, especially the older ones, have difficulty teaching online with advanced applications (Lukas & Yunus, 2021). Some of them have concerns about continuous school support, extra workload and responsibility, frustrating experiences, and possible failure of MALL (Chiu & Churchill, 2016; Haghighi et al., 2019; Lukas & Yunus, 2021). For example, some language centers have restricted the use of mobile devices in classroom learning (O'Neill et al., 2018). Some teachers believe that it is difficult to observe learners' body language, detect learners' dishonest behavior, monitor learners' progress, evaluate their performance, provide individualized feedback (Lukas & Yunus, 2021), and monitor phone use in class because learners have their own mobile devices (Ali & Deris, 2019). Some teachers are concerned that the notifications, advertisements, and calls waste learners' time, interrupt the learning process, and affect learners' concentration (Ali & Deris, 2019; Andujar et al., 2020; Criollo-C et al., 2021; Deris & Shukor, 2019; Mei & Yang, 2019; Zhang & Pérez-Paredes, 2021).

Second, there are some health, privacy, security, and restriction concerns (Shuib et al., 2018). For example, some respondents believe that too much exposure to the screen leads to eye strain, headaches, and other possible health problems (Lukas & Yunus, 2021; Önal et al., 2019; See et al., 2019; Shuib et al., 2018). Some respondents are concerned that their privacy will be violated (Shuib et al., 2018). Some respondents cannot play mobile games casually because they are concerned about limited time and credit (Deris & Shukor, 2019). Some respondents are concerned about the amount of time and effort required for MALL activities (Hsieh et al., 2017).

Third, there might be other problems in the real-world application of MALL. For example, in a study conducted by Day and Song (2017), it was found that some challenges were encountered when doctors, nurses, clinicians, and patients interacted with translation apps. For example, patients' physical conditions, such as low vision, make it difficult to interact with the iPad. The examples/answers in the app are stereotypical and may not meet the needs of the respondents. Some respondents feel that it is time-consuming to examine the patient in poor conditions while interacting with the translation apps (Day & Song, 2017).

4. Discussion

First, this research has shown that TAM and UTAUT are the two most used models to examine the acceptance and readiness of MALL users. Besides, respondents generally have a positive acceptance and readiness for MALL, and they have sufficient knowledge and experience with MALL. These findings are consistent with previous research, such as Alghazi et al. (2020). However, this research also found that some other variables such as gender, age, mobile app design, teaching/learning experience with mobile devices,

preferences in their studies, etc. may influence users' behavioral intentions. These variables should be considered to improve the acceptance and readiness of MALL users. Besides, MALL developers need to consider more diverse user needs and contexts, enhancing customization and flexibility of learning applications.

Second, based on the 49 articles, four main categories of affordances of MALL were distinguished in this study, including technology-based affordances, functional affordances, language learning-based affordances, and psychological affordances of MALL, which covered almost all aspects of affordances of MALL and offered deeper insights than previous research, such as Zain and Bowles (2021).

Some articles even explained why mobile apps are commonly used in the MALL contexts. This is partly because mobile apps offer more practical, convenient, fun, economical, and interactive features for learners to access instantly compared to printed materials (Chen & Zhao, 2022; Lukas & Yunus, 2021; Zhang & Pérez-Paredes, 2021). Partly because the design of mobile apps satisfies the needs of stakeholders and matches their reading interests and preferences (See et al., 2019). Partly because the instructional materials can be adapted according to students' abilities (Lukas & Yunus, 2021), so teachers do not need to create customized learning elements, which could save instructional time (Ali & Deris, 2019; Purgina et al., 2019).

Third, as for the challenges of MALL, based on the categories of Sophonhiranrak (2021), namely technology-related problems, technical skills, and teachers' attitudes toward m-learning, this research has classified the challenges of MALL into three different categories, including infrastructural and technological challenges, user-related issues, and application concerns in the MALL context, which is deeper and broader. To address the above challenges, some suggestions are provided according to the 49 articles and previous literature reviews.

First, as for infrastructural issues, power supply and internet coverage, speed and stability should be improved especially in some countries/regions (Metruk, 2022; Mussa & Sazalli, 2021; Shuib et al., 2018). The free public network and offline mobile apps are recommended (Botero et al., 2018; Deris & Shukor, 2019).

Second, in terms of developing and designing mobile apps, collaboration between app designers and teachers is recommended. Mobile apps should be available in different app stores. It is necessary to improve the design and learning content, such as adding vocabulary search functions, highlights, and animation, to make learning easier and clearer, maintain learners' attention, and improve various skills (Wang & Hsu, 2020). Learning materials should be updated to meet learners' various needs and gradually improve abilities (See et al., 2019). The videos should be recorded more professionally (Haghighi et al., 2019). More common languages can be included in the mobile apps (Day & Song, 2017). However, it is suggested to display the languages separately, i.e., one language at a time in case of confusion (See et al., 2019).

Third, teachers should be trained and be well equipped with mobile technologies for teaching with MALL (Nasir et al., 2021; Lin et al., 2022), provide effective feedback, instructions, encouragement, support, and successful learning examples for learners (Doan, 2018; Haghighi et al., 2019; Hoi & Mu, 2021; Huang et al., 2021; Shuib et al., 2018), enable learners to get more MALL exposure inside and outside the classroom (Nasir et al., 2021), and take steps to improve learners' concentration (Criollo-C et al., 2021) and self-

management skills (Doan, 2018). Younger students should be supported by their parents or other family members (See et al., 2019).

There are some limitations to this literature review. First, to narrow down the selection range and ensure the quality of the review, articles were selected from journals indexed by Scopus based on the pre-established inclusion and exclusion criteria. Therefore, some research that did not meet the review criteria was not included, which could to some extent affect the overall picture of the research status and trends. Second, the review was conducted by an individual researcher, thus the research findings might be subject to some subjectivity and bias.

5. Conclusions and implications

This systematic literature review included 49 articles published in the Scopus database to discover the acceptance, readiness, affordances, and challenges of MALL. This study had some unique findings. First, this study demonstrated a wide range of acceptance and readiness across diverse populations, which goes beyond some previous studies that focused primarily on ESL/EFL learners. The inclusion of nontraditional learners, such as parents, younger students, clinicians, nurses, and patients, provides a broader understanding of the applicability and effectiveness of MALL in different user groups.

Besides, while the TAM and the UTAUT are the most used models, additional variables such as mobile app design, daily usage duration, and specific user characteristics such as age and educational background are considered in our study. These factors might influence behavioral intentions toward MALL, suggesting that existing models need to be updated to reflect these dimensions.

In addition, our research highlights not only the technological and functional affordances of MALL but also the psychological and pedagogical affordances, such as reducing anxiety and enhancing collaborative learning, which have received less attention in previous research.

Moreover, this literature review comprehensively explores the multiple aspects of challenges faced by MALL, encompassing infrastructural and technological challenges, user-related issues, and application concerns. These findings not only broaden our insights of the barriers to successful MALL implementation but also provide directions for overcoming these challenges to enhance user engagement and learning outcomes.

Regarding the practical implications, developers can create more user-friendly, user-oriented, and engaging MALL apps according to user preferences and the effectiveness of various app features. Educational institutions and policymakers should consider integrating MALL strategies that address a diverse learner population and ensure that mobile learning resources are accessible and used effectively in different learning environments, including formal and informal settings.

In terms of theoretical implications, the other variables that might influence MALL users' intentions increase the potential for extending the traditional models of technology acceptance in the educational context. This could lead to new theoretical frameworks that consider the evolving dynamics of digital learning technologies.

In conclusion, this literature review not only highlights the expanded scope and potential of MALL in enhancing language learning but also calls for continuous innovation

and adaptation in m-learning technologies. As mobile technology evolves, to ensure that learning activities remain effective and relevant in different educational settings, future research should continue to explore this dynamic

Author Statement

The author declares that there is no conflict of interest.

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