

No App? Build It! A Review of Research to Guide Idiom Learning App Development in LCTLs

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Abstract

This integrative literature review synthesizes findings from 51 empirical studies (2010–2025) to identify evidence-based strategies and design principles for developing mobile-assisted idiom learning apps, particularly for less commonly taught languages (LCTLs). Eight thematic categories emerged, including contextualization, visual aids, etymological elaboration, gamification, flashcards, immediate feedback, and app aesthetics, simplicity, and structure. The findings suggest that these elements, if incorporated in an idiom learning app, may enhance idiom comprehension, retention, and learner engagement. Importantly, the review highlights the underrepresentation of LCTLs in current research and calls for more inclusive app development. While the primary focus is on mobile learning, the insights gained can also be applied to classroom-based idiom instruction using traditional and digital resources. Recommendations for educators are provided, including but not limited to the use of the micro-learning strategy and the suitability of idiom learning

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for low-level language learners, along with suggestions for future research.

Keywords: Idiom learning; mobile-assisted language learning (MALL); LCTLs; language learning apps; idiom instruction

Introduction

In recent years, mobile-assisted language learning (MALL) has become an increasingly prominent approach in language education (Ali et al., 2024; Iftikhar, 2025). Defined as the use of mobile devices—such as smartphones and tablets—for language learning purposes (Valarmathi, 2011), MALL offers learners flexible access to language practice anytime and anywhere and supports both formal and informal learning contexts (Oz, 2014). Its features, such as convenience, portability, and potential for student-instructor collaboration (Oz, 2014), have made mobile technologies particularly appealing to educators who are seeking innovative tools to support second language acquisition (e.g., Dağdeler & Demiröz, 2022).

This trend is especially relevant for instructors of LCTLs, where up-to-date, high-quality instructional materials may be limited or unavailable. Mobile apps have the potential to bridge this gap, as they offer scalable, cost-effective tools that can supplement instruction and provide learners with additional learning opportunities both in and outside the classroom (e.g., Yuen & Schlote, 2024). The potential benefits of integrating mobile technologies into language learning are supported by a growing body of research. For instance, a recent systematic review of 70 MALL studies

conducted in Iran by Morady Moghaddam, Esmailpour, and Ranjbaran (2025) found that 94% of the reviewed studies, conducted across diverse educational contexts and in different countries, reported positive outcomes associated with MALL use. These outcomes included improvements in language skills such as vocabulary, speaking, listening, reading, and writing, as well as positive effects on learner attitudes, motivation, and engagement.

Thanks to the rise of low-code and no-code platforms (e.g., Glide, Adalo, Thunkable), accelerated by the COVID-19 pandemic, a growing body of research on MALL-related topics (Guo, Jeyaraj, & Razali, 2024), and increased institutional interest in digital pedagogy, language educators are now in a stronger position than ever to participate in app development initiatives. Equipped with insights from empirical research, they can collaborate with developers to design simple language learning apps tailored to specific pedagogical needs.

One area of language instruction that continues to present challenges for both teachers and learners is idiomatic language. Idioms, multi-word expressions whose meaning cannot be derived from the literal interpretation of their individual components (Brenner, 2011), play a crucial role in communication, cultural understanding, and idiomatic,

intercultural, and pragmatic competences (e.g., Liantas, 2003; Lungu et al., 2023; Thiel, 1979; Wray, 2000). Idiomatic competence, defined by Liantas (2003, p.299) as “the ability to understand and use idioms appropriately and accurately in a variety of sociocultural contexts, in a manner similar to that of native speakers, and with the least amount of mental effort”, is widely recognized as an essential component of advanced language proficiency (e.g., Fernando, 1996; Wray, 2000).

Despite their importance, idioms often receive limited attention in the language classroom, not only in LCTL but even in ESL and EFL classrooms (e.g., Nadeem & Almowalad, 2022). For instance, as Mekheimer (2025) uncovered in a recent study, EFL teachers face various challenges in idiom instruction, including but not limited to resource limitations, curriculum constraints, and cultural barriers. Struggles with idiom instruction, lack of time, or resources often result in minimal coverage of idioms in a classroom or avoidance of this language material. Consequently, learners might be left with insufficient exposure to idiomatic expressions, which may ultimately hinder their ability to understand native speech or express themselves naturally in the target language. Given this gap, mobile apps represent a promising avenue for idiom

instruction, especially since idioms' imageability, fixed form, and frequency in authentic speech make them especially well-suited for short, focused practice in app environments.

A small but growing number of empirical studies have begun to explore this potential. Several purpose-built mobile applications have shown promising results for idiom learning. MEILA was associated with improved learning outcomes and positive learner perceptions (Wu et al., 2021, 2023). Ediom increased learner motivation and supported idiom comprehension, while also outperforming a traditional instructional approach (Li, 2022). Idiomatigo was reported to promote enjoyment, involvement, and reduced anxiety during learning (Ahmed et al., 2022). Similarly, users of Idiomobile expressed positive attitudes toward the app (Amer, 2014).

However, while these early results are encouraging, a cohesive summary of best practices for idiom app design and pedagogical integration is still missing. The present review addresses this gap.

The Present Study

This paper reviews empirical studies from the fields of MALL, vocabulary instruction, and idiom learning to identify key design principles and instructional practices that promote idiom acquisition and can be incorporated into a mobile application. The goal of the present study is to support LCTL

educators, curriculum designers, and educational technology experts who may wish to develop or evaluate idiom learning apps in LCTL programs.

To that end, this paper reviewed 51 empirical studies published between 2010 and 2025. Most studies were drawn from language education contexts, while a small number (Zhu & Yang, 2023; Zhang et al., 2023) were included from adjacent fields such as educational interface design and visual attention research. These design-focused studies, although not language-specific, offer relevant evidence about visual and structural features that influence learning efficiency and user engagement in mobile platforms.

The following research questions guided the review:

- 1. Based on findings from empirical studies, how should idioms be presented and practiced in a MALL environment to maximize learning outcomes?**
- 2. What pedagogical and design features should be incorporated into idiom learning apps to support effective learner interaction with the app, engagement, and acquisition?**

Design

This study employed an integrative literature review approach. Integrative reviews are designed to synthesize and evaluate knowledge from studies that may differ in methodology, research design, and disciplinary perspective in order to generate new insights and directions for future research (Cronin & George, 2023). This approach was appropriate for the present study because research relevant to the development of apps for learning idioms spans multiple fields, including second language pedagogy, mobile-assisted language learning (MALL), educational technology, and digital language learning. The purpose of the review was not to evaluate a single intervention or establish a definitive effect size, but rather to identify instructional practices and app design features associated with successful idiom learning outcomes and to generate research-informed recommendations for future app development.

Eligibility Criteria

To be included in this review, studies had to meet the following criteria: (1) be empirical in nature; (2) be written between 2010 and 2025; (3) be written in English; (4) report findings relevant to one or more of the following: (a) effective ways to present idioms to second language learners; (b) effective strategies for idiom or general vocabulary practice in mobile apps or suitable for app environment; (c) app features

or design elements that can improve user interaction with the app.

Studies that focused on L1 acquisition, general CALL (computer-assisted language learning), book chapters, reviews, conference proceedings, and conceptual, theoretical, or opinion-based publications were excluded. General CALL studies were excluded because the present review specifically focused on mobile-assisted language learning (MALL) and instructional practices relevant to mobile app development.

Because the purpose of this integrative review was to identify instructional practices and app design features reported across empirical studies rather than evaluate intervention effectiveness or calculate effect sizes, no formal methodological quality appraisal (e.g., using standardized risk-of-bias or critical appraisal tools) was conducted. Instead, only empirical studies that met the predefined inclusion criteria were included in the synthesis.

Information Sources and Search Strategy

The literature search was conducted between May 1 and June 1, 2025, using databases available through the University of Cincinnati Libraries: Wiley Online Library, Scopus, and ERIC. These databases were selected because together they provide broad coverage of the disciplines relevant to the present

review. Scopus offers extensive multidisciplinary indexing, ERIC specializes in education research, and Wiley Online Library provides access to peer-reviewed journals in applied linguistics, language education, and educational technology. Together, these databases were considered appropriate for identifying empirical studies on idiom instruction, mobile-assisted language learning (MALL), educational technology, and app design.

A combination of Boolean and keyword search techniques was used to identify relevant studies. Search terms focused on three broad areas: (a) idiom learning and instruction (e.g., “idiom learning,” “idiom instruction,” “idiom acquisition”); (b) mobile-assisted language learning and educational technology (e.g., “mobile-assisted language learning,” “MALL,” “mobile learning,” “language learning applications”); and (c) app design features relevant to language learning (e.g., “gamification,” “flashcards,” “visual support,” “etymological elaboration,” and “mobile app design”). Search terms related to LCTLs were not included because the purpose of the review was not to identify studies conducted exclusively in LCTLs. Rather, the review sought to synthesize broadly applicable evidence on idiom instruction, mobile-assisted language learning, and app design features that could inform the development of idiom learning

applications for LCTL contexts, where empirical research remains limited.

In addition to database searches, a snowballing method was employed. Reference lists of key studies were reviewed to identify additional articles that met the inclusion criteria.

Selection Process

A total of 63 potentially eligible studies with full-text availability were identified through database searches and backward citation tracking. During the organization of search results, 12 duplicate records were identified and removed. The remaining 51 unique studies met the review's inclusion criteria and were retained for analysis. Each study was examined in full and subsequently grouped by topic and subtopic according to its primary focus and contribution to the review's research questions. The thematic categories were developed inductively based on recurring instructional techniques, app features, and pedagogical approaches identified across the included studies.

The selected studies span a wide range of instructional designs, learner populations, and methodologies, and together, they form the basis for the synthesis presented in the following sections. It is worth mentioning that although

51 unique empirical studies (See Table 1) were included in the review, one study (Ahmed et al., 2022) was thematically relevant to two distinct categories (Immediate Feedback and Games) and was therefore counted in both, resulting in a total of 52 entries across thematic subgroups included in Table 1.

Table 1. Selected Articles: Grouping

Topic	Subtopic	Authors and year of publication	Total number
Idiom Presentation	Context	Alhaysony (2017) Al-Khawaldeh et al. (2016) Boulaares (2025) Rohani et al. (2012) Soleimani & Aghazadeh (2024) Türker (2019)	6
Idiom Presentation	Visuals	Albaqami (2023) Aydin (2017) Fotovatnia & Khaki (2012) Khoshnevisan (2019) Mehrpour & Mansourzadeh (2017) Ramonda (2022) Solhi et al. (2014) Zarei (2020)	8

Idiom Presentation	Etymological Elaboration	Bagheri & Fazel (2010) Baleghizadeh & Bagheri (2012) Jahangard & Sedaghatkar (2019) Noroozi & Salehi (2013) Razmjoo et al. (2016)	5
Idiom Presentation	Etymological Elaboration + Visuals	Golaghaei & Kakolian (2015) Haghshenas & Hashemian (2016)	2
Idiom & Language Practice	Gamification	Ahmed et al. (2022) Hao et al. (2019) Karaaslan et al. (2018) Kohnke (2020) Perry (2021) Razali et al. (2020) Xu & Richardson (2024)	7
Idiom and Language Practice	Flashcards	Aprilani (2021) Dizon & Tang (2017) Dizon (2016) Fathi et al. (2018) Jabbari Moghaddam & Rahmani (2025) Khan (2022)	14

		Khoshnevisan (2020) Lam et al. (2018) Li & Tong (2019) Pham (2022) Prayogi & Wulandari (2021) Ulandari (2019) Waluyo & Bucol (2021) Xodabande et al. (2022)	
App Design, Features, & Organization	Immediate Feedback	Ahmed et al. (2022) Klimova & Polakova (2020) Wei (2023)	3
App Design, Features, & Organization	Design & User Experience	Abu-al-Aish & Love (2013) Ekinici & Ekinici (2017) Kamaruzaman & Zainol (2012) Kutluk & Gülmez (2014) Müller et al. (2018) Zhang et al. (2023) Zhu & Yang (2023)	7

Results: General Characteristics of the Studies

The 51 empirical studies included in this review were published between 2010 and 2025, including 17 studies (33.3%) published between 2021 and 2025. While the majority of studies targeted English as a second or foreign language (EFL/ESL), four studies focused on other target languages, such as French (Perry, 2021) and LCTLs, including Arabic (Boulaares, 2025) and Chinese (Lam et al., 2018; Li & Tong, 2019). Participant populations were diverse, with learners from Iran, Japan, Indonesia, Vietnam, Turkey, Saudi Arabia, Korea, China, the Czech Republic, and other countries. Most participants were intermediate-level language learners, although several studies involved beginner or upper-intermediate and advanced learners. These characteristics reflect the global and varied landscape of research on mobile learning and idiom instruction.

However, it is important to note that empirical studies focused on LCTLs remain exceedingly rare in this body of literature. Only three studies in the sample examined LCTL contexts: one focused on Arabic (Boulaares, 2025) and two on Chinese (Lam et al., 2018; Li & Tong, 2019). These studies explored idiom learning, vocabulary instruction, and MALL in LCTL settings. This lack of research leaves a critical gap in our understanding of how MALL, including idiom learning,

can be implemented, adapted, or scaled in LCTL programs. Without such research, the development of targeted pedagogical tools, instructional strategies, and context-specific apps remains limited, which in turn slows innovation and may reduce the visibility and appeal of LCTLs in an increasingly digital educational landscape.

RQ1. Based on findings from empirical studies, how should idioms be presented and practiced in a MALL environment to maximize learning outcomes?

To address the research questions guiding this review, the 51 selected studies were organized into eight thematic categories based on their central focus. These categories reflect pedagogical strategies and app design elements addressed across the literature, specifically: (1) idioms in context, (2) visual aids, (3) etymological elaboration, (4) etymological elaboration combined with images, (5) gamification, (6) flashcards, (7) immediate feedback, and (8) apps' visual attractiveness, structural clarity, and simplicity. While some studies intersect across several themes, each was classified according to the findings relevant for this study's research focus. The following sections summarize key findings within each category.

Context. As Lontas (2008, 2015) emphasizes, idioms should be introduced in authentic, natural-sounding contexts rather

than through artificially constructed texts overloaded with idiomatic expressions. Empirical studies confirm that context is crucial for idiom comprehension. For instance, Rohani, Ketabi, and Tavakoli (2012) reported on the impact of context as a strategy employed by EFL learners and indicated the context's influential role in idiom comprehension. Türker (2019) found that learners could comprehend unfamiliar L2 idioms even without direct L1 equivalents, provided the idioms were embedded in a supportive context. Two studies, Alhaysony (2017) and Al-Khawaldeh et al. (2016), reported that language learners overwhelmingly rely on contextual inference strategies when decoding unfamiliar idioms and identify context as their most frequently used or preferred strategy. Boulaares (2025) found that when idioms were taught in culturally rich contexts, students developed greater conversational competence. Finally, Soleimani and Aghazadeh (2024) conducted an experimental study that revealed learners in a contextualized MALL condition significantly outperformed peers in both immediate and delayed post-tests. Taken together, these findings suggest that an idiom learning app for LCTLs, or MALL-supported idiom instruction strategies more broadly, should incorporate rich, authentic contexts (e.g., sample sentences, dialogues, or corpus-informed examples) to enhance learners' comprehension and retention.

Visuals. The use of visual aids is another strategy that aligns well with mobile app environments. Clark and Paivio (1991) explain that combining verbal and visual input activates the brain's imagery system, making language input more comprehensible and easier to retain. This is especially relevant for idioms, which often have figurative meanings that are difficult to interpret without additional cues. Several studies confirm that visual support significantly enhances idiom learning. For instance, Aydın (2017) found that the mental imaging technique, where students created internal visual representations of idioms, was more effective than both context-in and context-out groups. Next, Ramonda (2022) found that learners performed best when both literal and figurative illustrations accompanied idioms, while Fotovatnia and Khaki (2012) showed that visual aids outperformed both definitions and L1 translation equivalents. Zarei (2020) reported that visualization techniques were significantly more effective than lexical awareness and even gamified methods in helping learners produce idioms. Similarly, Albaqami (2023) found visualization to be the most effective idiom learning method when compared to both contextualization and decontextualization. Finally, one study emphasized learners' positive perceptions of visual input for idiom decoding, with preferences for images and videos (Khoshnevisan, 2019). These findings suggest that an app for learning LCTL idioms

or traditional teaching methods would greatly benefit from incorporating multimodal content, such as images, videos, or other visual aids, to reduce cognitive load, support deeper processing, and boost learner engagement.

Etymological Elaboration. Etymological elaboration is defined as “referring to the etymology of idioms in order to understand their idiomatic meaning” (Bagheri & Fazel, 2010, p.45). Five studies under review support the effectiveness of this idiom presentation technique. For example, Bagheri and Fazel (2010) found that providing learners with the origins of idioms significantly enhanced both comprehension and retention. Similarly, Jahangard and Sedaghatkar (2019) reported that etymology, as well as pictorial methods, had a positive effect on the immediate and delayed retention of the idioms. Razmjoo, Songhori, and Bahremand (2016) reported that learners taught through etymological elaboration outperformed those in other instructional conditions on both retention and recall measures. Noroozi and Salehi (2013) also demonstrated its superiority over rote memorization, while Baleghizadeh and Bagheri (2012) confirmed etymology’s contribution to both understanding and retention of idiomatic expressions. Altogether, these findings suggest that etymological elaboration is a well-supported strategy to idiom learning. For idiom learning apps targeting LCTLs or

classroom idiom-targeted exercises, incorporating short, accessible explanations of idiom origins—or metaphorical mappings—can deepen learners’ understanding and make the learning experience more memorable.

Etymological Elaboration and Visuals. Although research on the combined use of etymological elaboration and visuals is extremely limited, the available evidence suggests this dual approach can be especially effective for idiom learning. Golaghaei and Kakolian (2015) found that pairing idiom origin stories with images led to better learning outcomes than either method alone. Similarly, Haghshenas and Hashemian (2016) reported that students who received both etymological explanations and visuals performed best on post-tests. These findings suggest that idiom apps could benefit from integrating short origin stories alongside supportive illustrations to enhance retention and engagement.

Gamification. In a pedagogical context, gamification refers to “the introduction of game design elements and gameful experiences in the design of learning processes” (Dichev & Dicheva, 2017, p.2). In the area of MALL, a mobile application or tool is seen as gamified if it includes elements of game dynamics, such as challenges, competition, rewards, and elements of mechanics, including but not limited to levels, badges, or points (Dichev & Dicheva, 2017). While

most MALL research has focused on general vocabulary or grammar learning, several studies have reported positive affective outcomes linked to gamified mobile learning environments. For example, learners in Kohnke's (2020) study appreciated the flexibility of "anytime-anywhere" learning and enjoyed the competitive aspects, like scoring. Other studies highlighted the appeal of game-based features like avatars, badges, quests, and teamwork (Perry, 2021), as well as the motivational value of rewards and challenge systems (Karaaslan et al., 2018; Razali et al., 2020), which can boost confidence in learning and positive attitudes toward it (Hao et al., 2019). In a recent study, Xu and Richardson (2024) demonstrated that gamified badge-sharing in a vocabulary learning app significantly enhanced learners' self-regulated learning (SRL) skills and vocabulary learning persistence. Although very few studies have specifically examined gamification in the context of idioms, one study (Ahmed et al., 2022) found that gamification significantly contributed to idiom knowledge growth. These findings suggest that gamification, combined with meaningful language input in an app or in a classroom, may increase motivation, promote repeated exposure, and make idiom practice more engaging for learners. However, the effectiveness of gamification depends on the quality of its implementation and the instructional context in which it is used (Slamet et al, 2024).

RQ2. What pedagogical and design features should be incorporated into idiom learning apps to support effective learner interaction with the app, engagement, and acquisition?

Flashcards. Learning vocabulary, including idioms, through both physical and digital flashcards has been found to be an effective technique, supported by several located research studies (Dizon, 2016; Khan, 2022; Waluyo & Bucol, 2021). Studies have also emphasized learners' positive perceptions of this method (Aprilani, 2021; Pham, 2022; Prayogi & Wulandari, 2021). Interestingly, the trend is shifting toward digital flashcards, which learners find more effective than traditional paper versions (Dizon & Tang, 2017; Lam et al., 2018; Li & Tong, 2019). Two studies even found digital flashcards to be more effective than traditional paper ones (Fathi et al., 2018; Xodabande et al., 2022). In the context of idioms, studies by Ulandari (2019) and Khoshnevisan (2020) found that the use of flashcards enhanced idiom knowledge. A more recent study by Jabbar Moghaddam and Rahmani (2025) provided additional support for this technique: young EFL learners who practiced idioms using interactive digital flashcards, featuring visuals, context, and activities, outperformed those who received traditional textbook-based instruction, not only in idiom retention but also in speaking

fluency. These findings suggest that digital flashcards, enriched with multimedia and interactivity, can serve as an effective component in idiom learning apps or teaching practices.

Immediate Feedback. Immediate feedback is widely recognized as a crucial component in language learning apps, especially for sustaining motivation and supporting self-regulated learning. Several studies confirm its value. Klimova and Polakova (2020) found that learners appreciated receiving quick corrective feedback while using a vocabulary app, citing it as a key contributor to app effectiveness. Similarly, in a study focused specifically on idioms, Ahmed et al. (2022) reported that users of the gamified app *Idiomatico* identified immediate feedback as a core element that enhanced their idiom acquisition. More recently, Wei (2023) examined young learners' engagement with mobile vocabulary apps and found that immediate, personalized feedback, including both correct answers and information about learning strategies, was strongly associated with learner satisfaction, motivation, and improved self-assessment. Applying these findings to MALL or classroom contexts, it can be suggested that providing immediate feedback may help learners stay engaged, monitor their progress, and refine their learning behaviors in real time.

Visual Attractiveness, Clear Structure, and Simplicity.

Aesthetic appeal, clarity, and ease of navigation are frequently cited as key factors in app-based language learning. Several studies confirm that learners respond more positively to well-designed, user-friendly apps. For example, Abu-al-Aish and Love (2013), Kamaruzaman and Zainol (2012), and Kutluk and Gülmez (2014) all found that attractive layouts and simple structure contributed to greater learner motivation, interest in m-learning, and engagement. In Ekinci and Ekinci's (2017) case study, users praised apps like Memrise and Acobot specifically for their clean design, user-friendly interface, and visual appeal. Conversely, Müller et al. (2018) observed that poor-quality graphics in the idiom learning app *Idiomatico* negatively affected learner attitudes. Beyond the language learning context, interface-focused studies by Zhu and Yang (2023) and Zhang et al. (2023) demonstrate that visual clarity, intuitive layout, and optimized information density can significantly improve user focus and learning efficiency. These findings underscore the importance of thoughtful interface design in educational apps, including idiom learning apps. Together, this body of research suggests that idiom learning apps designed for LCTLs may benefit from prioritizing aesthetic simplicity, streamlined structure, and visual clarity to enhance user satisfaction and usability.

Discussion

While the review primarily sought to identify research-informed practices for developing idiom learning apps, many of the findings can also enhance traditional classroom instruction.

Among the review's findings highlighting high-impact techniques, the first one, contextualized presentation, examined in six empirical studies, emerged as one of the most consistently effective strategies across learner populations. Across different learning contexts, the reviewed studies showed that embedding idioms in rich, authentic contexts, such as sample sentences, stories, dialogues, or culturally meaningful scenarios, supports comprehension and retention. This finding supports prior claims (e.g., Lontas, 2008, 2015) that idioms should be taught in naturalistic discourse rather than isolated, artificially created examples. This means that idiom learning apps or classroom interventions should aim to replicate contextual richness. One practical strategy for doing so is drawing on corpus-based data. Corpora can provide naturally occurring examples of idioms in use, ensure that learners encounter frequently used expressions first (McEnery & Xiao, 2011), and help app developers or teachers identify authentic collocational patterns. Corpus-informed instruction also allows for context customization, such as

selecting contexts relevant to learners' age, interests, or proficiency level. Whether in app development or classroom instruction, corpora offer a useful tool for enhancing the teaching of idioms with meaningful, high-utility examples.

Visual support, especially a combination of figurative and literal meaning images, was also shown to enhance idiomatic learning. Learners benefited from illustrations, videos, and mental imagery, all of which can reduce cognitive load and support dual coding processes (Clark & Paivio, 1991). Several studies found that visual input was not only more effective than definitions or translations but was also preferred by learners. Importantly, nowadays, with the increasing availability of AI-based visual generators (e.g., DALL·E, Midjourney, Adobe Firefly), instructors can quickly create high-quality illustrations or even short animated clips to represent idioms, to include them in apps or standard classroom instruction materials. This not only saves time but also allows for tailored, engaging content that aligns with students' needs and interests. Learners often respond positively to multimedia input, and the ease of generating such content can help bridge the gap between traditional instruction and tech-enhanced learning. However, it must be noted that AI-generated content should be reviewed carefully

for accuracy, cultural appropriateness, and compliance with applicable copyright and licensing requirements.

In addition, etymological elaboration—introducing learners to the historical or metaphorical roots of idioms—was supported as a useful strategy for enhancing understanding and long-term retention. When paired with visual elements, etymological elaboration yielded even stronger effects. However, it should be noted that etymological information, if present in an idiom learning app or lesson materials, should be short, comprehensible, and as suggested by Wiliński (2022), provide only “basic information concerning the origin of this idiom and hence this note does not distract users’ attention from idiomatic meaning” (p. 120).

Regarding idiom practice, the presence of gamification elements (e.g., badges, points, competitive challenges) was positively associated with learners’ motivation, engagement, and self-regulated learning behaviors. According to the findings, even simple gamified elements such as earning points for correctly using idioms or collecting digital rewards may significantly boost learner engagement and could be considered in both app development and lesson planning. However, gamification should complement rather than replace meaningful language-use activities, as the effectiveness of game elements

depends on how they are integrated into the learning experience.

Flashcards, especially digital ones, were also supported across multiple studies and found useful in terms of memorization and recall, and with learners rating them as effective, convenient, and motivating. In LCTL instruction, idiom-focused flashcards can incorporate definitions, example sentences, and visuals, which makes them highly adaptable. Given how easy it is to create digital flashcards using free tools or apps, this technique can be readily integrated into both classroom teaching and mobile-supported independent learning. At the same time, to enhance learning benefits, flashcards should be designed to promote active retrieval and meaningful engagement rather than simple memorization or passive review.

Immediate feedback, particularly automated, task-specific feedback, emerged as a desirable and effective design feature. Learners valued clear indicators of progress and suggestions for improvement, especially when these were tied to curricula or personalized goals. Thus, a well-designed idiom learning app would benefit from this feature, which can be utilized in, for example, assessments in an app, such as quizzes or practice exercises. Importantly, this insight also extends to classroom instruction: whether using digital tools

or paper-based activities, providing learners with timely, specific feedback on idiom usage can help consolidate knowledge, support self-regulation, and reinforce learning outcomes (Wei, 2023).

Finally, several studies (e.g., Müller et al., 2018; Zhang et al., 2023; Zhu & Yang, 2023) underscored the importance of app aesthetics, simplicity, and clear navigation. Visually appealing and easy-to-use apps were more likely to sustain learner attention and promote a positive effect. Conversely, cluttered or poorly designed interfaces negatively impact engagement. These principles, although with certain adaptations, might be helpful, for instance, when designing digital environments such as e-dictionaries or idiom collections using tools like Book Creator, or even when preparing traditional handouts. A clean, intuitive layout helps learners focus on content rather than deciphering the format, reducing cognitive load and improving overall learning experiences.

Synthesis of these findings offers a research-informed foundation for developing idiom learning apps that are both pedagogically effective and user-friendly. While most existing studies focus on English learners, the lack of research on LCTLs underscores the urgent need for more tools and investigations in these contexts. Fortunately, with low-code

and no-code platforms becoming more accessible, LCTL educators have new opportunities to co-create customized mobile solutions. Crucially, the strategies identified in this review—contextualization, visuals, feedback, gamification, and flashcards—are not limited to apps. They can also enhance traditional and blended classrooms, whether through digital flashcards, idiom-based games, or sharing origin stories in class chats. In this way, the review supports innovation in both mobile-assisted and conventional idiom instruction.

Conclusion and Pedagogical Recommendations

This review synthesized findings from 51 empirical studies published between 2010 and 2025 on idiom instruction, MALL, and related topics. The goal was to identify which idiom presentation and practice techniques, app features, and design choices contribute to more effective idiom learning, and thus can be used in an idiom learning app. The review suggested that strategies such as contextual presentation, visual support, etymological elaboration, gamification, flashcards, and immediate feedback all support idiom comprehension and retention and are favored by language learners. Additionally, clear structure, simple navigation, and appealing visual design contribute to user satisfaction and learning engagement.

Although the review's original goal was to support the development of idiom learning apps for LCTLs, these findings are valuable for traditional and blended classrooms. Teachers can incorporate many of the same features and techniques using standard materials and freely available tools. For example, teachers can create classroom-based activities that use images, storytelling, or discussions of idiom origins to scaffold meaning. If an idiom learning app is available or a mobile environment is used, a mobile microlearning technique, described by Jubran (2024) with bite-sized idiom learning modules ranging from five to ten minutes, depending on contexts, learner populations and proficiency level, and other factors if delivered regularly, could be employed to enhance retention and fit seamlessly into language lessons.

It also must be noted that teachers play a key role in promoting students' out-of-class engagement with mobile tools. Their encouragement has been shown to increase learners' investment and persistence in MALL environments (Hwang & Loewen, 2025). When proactive, encouragement from instructors, guidance, and follow-up can shape students' willingness to engage with MALL resources outside of class. This role may be particularly important in LCTL contexts, where learners often have fewer opportunities for authentic language exposure and fewer commercially available learning

resources outside the classroom. Consequently, teacher-guided integration of mobile apps may help sustain learner engagement and extend learning beyond class time.

Apps can also be used as springboards for classroom interaction. For example, idioms explored through an app could later be embedded in follow-up tasks, such as group discussions, scaffolded dialogues, or experiential activities like role-playing (Prayuda et al., 2024). These active learning strategies can reinforce idiom use in communication and promote deeper understanding.

Finally, this review challenges the assumption that idioms are too advanced for beginners. Empirical findings demonstrate that even A1–A2 level students can successfully acquire idiomatic expressions, especially when visuals and other supports are provided (Calderón & Cedeño, 2023). However, the successful introduction of idioms at beginning levels likely depends on careful selection, with preference given to high-frequency, relatively transparent idioms that are supported through appropriate instructional scaffolding. When these conditions are met, idioms can be introduced early to enrich learners' intercultural competence and language learning enjoyment.

Limitations and Suggestions for Future Research

While this review aimed to be comprehensive and systematic, several limitations should be acknowledged. First, as a solo-researcher project, there is a possibility that some relevant studies were unintentionally omitted despite a careful and structured search process. Second, a portion of the reviewed articles, particularly those published earlier in the 2010s, may not fully reflect the technological advancements and pedagogical shifts in MALL and idiom instruction. Third, only a small number of studies focused on LCTL, which makes it difficult to determine whether strategies shown to be effective in English language contexts would translate seamlessly to LCTL instruction. Finally, although the review highlighted features relevant to app design, relatively few studies investigated idiom-specific mobile apps. This limits the degree to which detailed app development guidelines could be drawn from existing research.

Speaking of future research directions, future studies should explore LCTL teachers' perspectives to better understand how idiom instruction is currently approached in classrooms and how the findings of this review align with real-world practices. Investigating which techniques teachers find most effective or impractical, and whether they are open to integrating mobile-assisted language learning, would offer a

more grounded, practice-informed view. Additionally, research should examine what features educators would find most useful in idiom learning apps, which should help to bridge the gap between research, design, and classroom application. Finally, although digital flashcards remain one of the most extensively researched and consistently supported techniques identified in this review, future research should continue exploring emerging multimedia approaches to idiom learning. Features such as interactive animations, short-form video, augmented reality, AI-generated visualizations, and other visually engaging instructional materials may offer additional benefits for learner engagement. However, because empirical evidence for these approaches remains limited, further research is needed before they can be recommended as evidence-based design principles for idiom learning apps.

References

- Abu-Al-Aish, A., & Love, S. (2013). Factors influencing students' acceptance of m-learning: An investigation in higher education. *International Review of Research in Open and Distributed Learning*, 14(5), 82-107.
- Ahmed, A. A. A., Widodo, M., Komariah, A., Hassan, I., Sukmana, N., Ali, M. H., ... & Rohi, A. (2022). Assessing the effects of gamification on developing EFL Learners' idiomatic knowledge: Do attitudinal factors contribute to the learning of the idioms with the game?. *Education Research International*, 1, 248-257.
- Albaqami, R. (2023). The impact of pictorial cues on understanding idioms among Arab EFL learners. *International Journal of English Linguistics*, 13(6).
- Alhaysony, M. H. (2017). Strategies and difficulties of understanding English idioms: A case study of Saudi University EFL students. *International Journal of English Linguistics*, 7(3), 70-84.
- Ali, M., Ranjhani, I., Shahbaz, Q., Rashid, M., & Shahzad, A. (2024). The Significance of "Mobile Assisted Language Learning" (MALL) for English Language Learning in a Digital Age: A Review. *Jaban-e-Tabqeeq*, 7(3), 382-396.

- Al-Khawaldeh, N., Jaradat, A., Al-Momani, H., & Bani-Khair, B. (2016). Figurative idiomatic language: Strategies and difficulties of understanding English idioms. *International Journal of Applied Linguistics and English Literature*, 5(6), 119-133.
- Amer, M. (2014). A study of learners' usage of a mobile learning application for learning idioms and collocations. *CALICO Journal*, 31(3), 285-302.
<https://doi.org/10.11139/cj.31.3.285-302>
- Aprilani, D. N. (2021). Students' perception in learning English vocabulary through Quizlet. *Journal of English Teaching*, 7(3), 343-353.
- Aydin, B. (2017). The effect of mental imaging technique on idiom comprehension in EFL learners. *Online Submission*, 5(4), 201-212.
- Bagheri, M. S., & Fazel, I. (2010). Effects of etymological elaboration on the EFL learner's comprehension and retention of idioms. *Journal of Pan-Pacific Association of Applied Linguistics*, 14(1), 45-55.
- Baleghizadeh, S., & Bagheri, M. M. (2012). The effect of etymology elaboration on EFL learners' comprehension and retention of idioms. *Journal of*

Language Teaching, Linguistics, and Literature, 18(1),
23-32.

Boulaares, D. M. (2025). The importance of teaching cultural
context when teaching idiomatic expressions in
Arabic. *Journal of Languages and Translation*, 5(5), 71-82.

Brenner, G. (2011). *Webster's new world: American idioms
handbook*. Houghton Mifflin Harcourt.

Calderón, P., & Cedeño, C. H. C. (2023). The use of pictorial
devices to improve English idioms elucidation among
EFL seventh-grade students. *UNESUM-Ciencias.
Revista Científica Multidisciplinaria*, 7(3), 50-59.

Clark, J. M., & Paivio, A. (1991). Dual coding theory and
education. *Educational Psychology Review*, 3(3), 149-210.
<http://dx.doi.org/10.1007/BF01320076>

Cronin, M. A., & George, E. (2023). The why and how of the
integrative review. *Organizational Research
Methods*, 26(1), 168-192.

Dağdeler, K. O., & Demiröz, H. (2022). EFL instructors'
perceptions of utilizing mobile-assisted language
learning in Higher Education. *Acta Educationis
Generalis*, 12(2), 22-40.

- Dichev, C., & Dicheva, D. (2017). Gamifying education: what is known, what is believed and what remains uncertain: a critical review. *International Journal of Educational Technology in Higher Education*, 14(1), 1-36.
- Dizon, G. (2016). Quizlet in the EFL classroom: Enhancing academic vocabulary acquisition of Japanese university students. *Teaching English with Technology*, 16(2), 40-56.
- Dizon, G., & Tang, D. (2017). Comparing the efficacy of digital flashcards versus paper flashcards to improve receptive and productive L2 vocabulary. *The EuroCALL Review*, 25(1), 3-15.
- Ekinci, E., & Ekinci, M. (2017). Perceptions of EFL learners about using mobile applications for English language learning: A case study. *International Journal of Language Academy*, 5(5), 175-193.
- Fathi, J., Alipour, F., & Saeedian, A. (2018). Enhancing vocabulary learning and self-regulation via a mobile application: An investigation of the Memrise app. *Journal of Modern Research in English Language Studies*, 5(1), 27-46.
- Fernando, C. (1996). *Idioms and idiomaticity*. Oxford University Press, USA.

- Fotovatnia, Z., & Khaki, G. (2012). The effect of three techniques for teaching English idioms to Iranian TEFL undergraduates. *Theory and Practice in Language Studies*, 2(2), 272-281.
<https://doi.org/10.4304/tpls.2.2.272-281>
- Golaghaci, N., & Kakolian, S. (2015). The effect of visual and etymological treatments on learning decomposable idioms among EFL learners. *International Journal of Applied Linguistics & English Literature*, 4(5), 72-81.
<https://doi.org/10.7575/aiac.ijalel.v4n.5p.72>
- Guo, P., Jeyaraj, J. J., & Razali, A. B. (2024). A systematic review of collaborative mobile-assisted language learning (C-MALL) practices using bibliometric, content, and scientometric analyses. *Humanities and Social Sciences Communications*, 11(1), 1-15.
- Haghshenas, M. S. M., & Hashemian, M. (2016). A comparative study of the effectiveness of two strategies of etymological elaboration and pictorial elucidation on idiom learning: A case of young EFL Iranian learners. *English Language Teaching (Toronto)*, 9(8), 140. <https://doi.org/10.5539/elt.v9n8p140>
- Hao, Y., Lee, K. S., Chen, S. T., & Sim, S. C. (2019). An evaluative study of a mobile application for middle

- school students struggling with English vocabulary learning. *Computers in Human Behavior*, 95, 208-216.
- Hwang, H. B., & Loewen, S. (2025). “Enthusiasm is contagious”: Teacher support for mobile-assisted language learning in a self-study context. *English Teaching*, 80(1), 3-22.
- Iftikhar, N. (2025). Mobile-assisted language learning (MALL): Revolutionizing second language acquisition. *Journal of Applied Linguistics and TESOL (JALT)*, 8(1), 1038-1045.
- Jabbari Moghaddam, M., & Rahmani, Z. (2025). Exploring the efficacy of digital flashcards (DFs) on young learners’ idiomatic expressions and speaking skills. *Applications of Language Studies*.
- Jahangard, A., & Sedaghatkar, M. (2019). A comparative analysis of the effect of using translation, definition, etymology, and imageable expressions on the retention of idioms. *Journal of Second Language Studies*, 2(1), 119-139. <https://doi.org/10.1075/jsls.17004.jah>
- Jubran, S. M. (2024). An instructional model based on mobile microlearning for teaching English idioms through songs to EFL learners. *Theory and Practice in Language Studies*, 14(4), 1105-1111.

- Kamaruzaman, M. F., & Zainol, I. H. (2012). Behavior response among secondary school students development towards mobile learning application. *Humanities, Science and Engineering*, 7, 589-592.
- Karaaslan, H., Kilic, N., Guven-Yalcin, G., & Gullu, A. (2018). Students' reflections on vocabulary learning through synchronous and asynchronous games and activities. *Turkish Online Journal of Distance Education*, 19(3), 53-70.
- Khan, R. M. I. (2022). The use of flashcards in teaching EFL vocabulary in online learning. *Register Journal*, 15(1), 109-125.
- Khoshnevisan, B. (2020). The effects of augmented reality (AR)-infused idiom material on Iranian students' idiom achievements, motivation, and perceptions. *Virtual and Augmented Reality in English Language Arts Education*, 2, 176-189.
- Klimova, B., & Polakova, P. (2020). Students' perceptions of an EFL vocabulary learning mobile application. *Education Sciences*, 10(2), 37-49.
- Kohnke, L. (2020). Exploring learner perception, experience and motivation of using a mobile app in L2 vocabulary acquisition. *International Journal of*

Computer-Assisted Language Learning and Teaching (IJCALLT), 10(1), 15-26.

Kutluk, F. A., & Gülmez, M. (2014). A research about mobile learning perspectives of university students who have accounting lessons. *Procedia-Social and Behavioral Sciences*, 116, 291-297.

Lam, E. T., Wang, L. C. C., & Zhao, X. W. (2018). Students' perception of Quizlet as a Chinese learning tool: a preliminary study. *International Journal of Technology Enhanced Learning*, 10(1-2), 128-136.

Li, J. T., & Tong, F. (2019). Multimedia-assisted self-learning materials: the benefits of E-flashcards for vocabulary learning in Chinese as a foreign language. *Reading and Writing*, 32, 1175-1195.

Li, S. (2022). *Scaffolding Chinese English language learners' idiomatic competence via self-designed Ediom mobile app*. [Unpublished doctoral dissertation]. University of South Florida.

Liontas, J. I. (2003). Killing two birds with one stone: Understanding Spanish VP idioms in and out of context. *Hispania*, 5, 289-301.

- Liontas, J. I. (2008). Toward a critical pedagogy of idiomaticity. *Indian Journal of Applied Linguistics*, 3(2), 135-148.
- Liontas, J. I. (2015). Developing idiomatic competence in the ESOL classroom: A pragmatic account. *TESOL Journal*, 6(4), 621-658.
<https://doi.org/10.1002/tesj.230>
- Lungu, M. R. (2023). Idiomatic phrases as a bridge for quality intercultural foreign language learning. *International Journal for Quality Research*, 17(1), 283-290.
- Mehrpour, S., & Mansourzadeh, N. (2017). English idioms and Iranian beginner learners: A focus on short stories and pictures. *The Reading Matrix*, 17(1), 97.
- Mekheimer, M. A. (2025). EFL idiom instruction: Teacher practices and challenges. *Social Sciences & Humanities Open*, 11.
- McEnery, T., & Xiao, R. (2011). What corpora can offer in language teaching and learning. In *Handbook of research in second language teaching and learning* (pp. 364-380). Routledge.
- Morady Moghaddam, M., Esmailpour, F., & Ranjbaran, F. (2025). Insights into mobile assisted language learning

- research in Iran: A decade review (2010–2023). *Education and Information Technologies*, 30(2), 2155-2181.
- Müller, A., Son, J. B., Nozawa, K., & Dashtestani, R. (2018). Learning English idioms with a web-based educational game. *Journal of Educational Computing Research*, 56(6), 848- 865.
- Nadeem, N., & Almolad, S. (2022). Challenges and strategies of acquiring English idioms for EFL undergraduate Saudi students. *Journal of Applied Linguistics and Language Research*, 9(4), 55-68.
- Noroozi, I., & Salehi, H. (2013). The effect of the etymological elaboration and rote memorization on learning idioms by Iranian EFL learners. *Journal of Language Teaching and Research*, 4(4), 845-851.
<https://doi.org/10.4304/jltr.4.4.845-851>
- Oz, H. (2014). Prospective English teachers' ownership and usage of mobile devices as m-learning tools. *Procedia-Social and Behavioral Sciences*, 141, 1031-1041.
- Perry, B. (2021). Gamified mobile collaborative location-based language learning. *Frontiers in Education*, 6, 76-89.

- Pham, A. T. (2022). University students' perceptions on the use of Quizlet in learning vocabulary. *International Journal of Emerging Technologies in Learning*, 17(7), 156-169.
- Prayogi, A. W., & Wulandari, M. (2021). Implementing a mobile application Quizlet to help Senior High School students learn vocabulary. *Journal of English Language Teaching*, 10(1), 87-99.
- Prayuda, M. S., Gultom, C. R., Purba, N., & Sharhan, A. N. (2024). From aversion to engagement: transforming EFL higher education students' approach to English idioms through role-playing. *English Review: Journal of English Education*, 12(2), 733-744.
- Ramonda, K. (2022). A double-edged sword: Metaphor and metonymy through pictures for learning idioms. *International Review of Applied Linguistics in Language Teaching, IRAL*, 60(3), 523-561.
<https://doi.org/10.1515/iral-2018-0336>
- Razali, N., Nasir, N. A., Ismail, M. E., Sari, N. M., & Salleh, K. M. (2020). Gamification elements in Quizizz applications: Evaluating the impact on intrinsic and extrinsic student's motivation. *Science and Engineering*, 1, 98-112.

- Razmjoo, S. A., Songhori, M. H., & Bahremand, A. (2016). The effect of two attention drawing techniques on learning English idioms. *Journal of Language Teaching and Research*, 7(5), 1043-1050.
<https://doi.org/10.17507/jltr.0705.28>
- Rohani, G., Ketabi, S., & Tavakoli, M. (2012). The effect of context on the EFL learners' idiom processing strategies. *English Language Teaching (Toronto)*, 5(9), 104-114.
- Soleimani, M., & Aghazadeh, Z. (2024). The implementation of MALL for idiom learning attainment during the COVID-19 pandemic: The case of Iranian EFL learners. *MEXTESOL Journal*, 48(2).
- Slamet, J., Basthomi, Y., Ivone, F. M., & Eliyanah, E. (2024). Unlocking the potential in a gamification-based MOOC: Assessing autonomous learning and self-directed learning behaviors. *Teaching and Learning Inquiry*, 12, 1-20.
- Solhi Andarab, M., & Rouhi, A. (2014). Let's replace words with pictures: The role of pictures and spatial intelligence in learning English idioms. *Theory and Practice in Language Studies*, 4(2), 244-254.
<https://doi.org/10.4304/tpls.4.2.244-25>

- Türker, E. (2019). Idiom acquisition by second language learners: The influence of cross-linguistic similarity and context. *Language Learning Journal*, 47(2), 133-144.
- Ulandari, C. S. (2019). Teaching idioms through flash cards to increase vocabulary achievement of the seventh-grade students. *International Journal of Technology Enhanced Learning*, 3(12), 46-59.
- Valarmathi, K. E. (2011). Mobile assisted language learning. *Journal of Technology for ELT*, 2(2), 1-8.
- Waluyo, B., & Bucol, J. L. (2021). The impact of gamified vocabulary learning using Quizlet on low-proficiency students. *Computer-Assisted Language Learning*, 22(1), 158-179.
- Wei, W. (2023). Understanding and supporting the use of feedback from mobile applications in the learning of vocabulary among young adolescent learners. *Studies in Educational Evaluation*, 78.
- Wiliński, J. (2022). Conventional knowledge, pictorial elucidation, etymological motivation, and structural elaboration in a thematic dictionary of idioms. *Anglica*, 31(2), 109-131.
<https://doi.org/10.7311/0860-5734.31.2.06>

- Wray, A. (2000). Formulaic sequences in second language teaching: Principles and practice. *Applied Linguistics*, 21(4), 463-489.
- Wu, W. C. V., Lin, I. T. D., Marek, M. W., & Ou Yang, F. C. (2021). Analysis of English idiomatic learning behaviors of an audio-visual mobile application. *Sage Open*, 11(2).
- Wu, W. C., Lin, I. T., & Chen Hsieh, J. (2023). Ubiquitous English idiom learning through mobile applications: Learning outcomes, motivation, anxiety, and behavioral patterns. *The Asia-Pacific Education Researcher*, 32(5), 665-684.
- Xodabande, I., Iravi, Y., Mansouri, B., & Matinparsa, H. (2022). Teaching academic words with digital flashcards: Investigating the effectiveness of mobile-assisted vocabulary learning for university students. *Frontiers in Psychology*, 13, 67-80.
- Xu, Q., & Richardson, J. C. (2024). The impact of social media and gamification of a mobile vocabulary learning app: self-regulation and learning persistence. *Online Learning*, 28(4), 4-36.
- Yuen, C. L., & Schlote, N. (2024). Learner experiences of mobile apps and artificial intelligence to support

additional language learning in education. *Journal of Educational Technology Systems*, 52(4), 507-525.

Zarei, A. A. (2020). L2 Idioms: On the effectiveness of teaching techniques. *Teaching English Language*, 14(2), 217-238.

Zhang, M., Hou, G., & Chen, Y. C. (2023). Effects of interface layout design on mobile learning efficiency: a comparison of interface layouts for mobile learning platform. *Library Hi Tech*, 41(5), 1420-1435.

Zhu, T., & Yang, Y. (2023). Research on mobile learning platform interface design based on college students' visual attention characteristics. *Plos One*, 18(7).