BARRIERS AND COPING STRATEGIES IN MALL INTEGRATION: UNIVERSITY EFL INSTRUCTOR'S PERSPECTIVES

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ABSTRACT

This study examined the barriers and coping strategies involved in integrating Mobile-Assisted Language Learning (MALL), including AI-driven tools, among 399 EFL instructors. Through a survey and supplemental interviews, the research explored how instructors' background characteristics influence their coping strategies and the barriers they encounter, as well as the relationship between these factors. Findings indicated a moderate level of overall perceived barriers, with extrinsic barriers rated higher than intrinsic barriers. Time constraints were identified as the most significant barrier. In terms of coping strategies, instructors predominantly relied on intrinsic factors over extrinsic ones, with attitude being the most utilized strategy. A strong negative correlation was found between perceived barriers and coping strategies, suggesting that instructors who perceive fewer barriers are more likely to employ coping strategies. No significant differences in perceived barriers or coping strategies were observed based on gender, age, position, teaching experience, area of specialization, or daily MALL usage. These findings accentuate the importance of addressing both extrinsic and intrinsic barriers to facilitate effective MALL integration. Implementing targeted interventions that provide technical support, institutional resources, and professional development, alongside strategies to foster positive attitudes and self-efficacy, is crucial in enabling EFL instructors to successfully integrate MALL into their teaching practices.

Keywords: Mobile Assisted Language Learning (MALL), English as a Foreign Language (EFL) instructors, barrier EFL instructors, coping strategy, Taiwan.

INTRODUCTION

Mobile-Assisted Language Learning (MALL) serves as an overarching framework that includes both general MALL and AI-driven MALL, reflecting the evolving role of technology in educational settings (Karakaya & Bozkurt, 2022). The ubiquitous nature of mobile devices, combined with the advanced capabilities of Artificial Intelligence (AI), has introduced transformative opportunities for personalized and adaptable language learning experiences. General MALL leverages mobile devices for language instruction, offering accessibility to various learning tools, apps, and multimedia resources. On the other hand, AI-driven MALL builds upon this foundation by employing advanced AI capabilities to create highly personalized, data-driven learning environments that cater to individual learners' needs (Kim, 2022). It enhances the language learning process by facilitating individualized learning paths, allowing students to focus on specific areas requiring improvement while accommodating diverse learning preferences. It also supports access to authentic and interactive learning materials, benefiting both learners and instructors by enhancing language acquisition and proficiency (Hsu et al., 2013). For example, AI algorithms analyze learner performance to provide targeted feedback, foster motivation, reduce anxiety, and improve outcomes (Alam & Mohanty, 2023; Kim,

2022). Through mobile devices and AI, learners can access online resources, language learning apps, and multimedia content, exposing them to authentic language use and enhancing language acquisition and proficiency (Karakaya & Bozkurt, 2022). Moreover, AI-driven MALL supports self-paced, flexible learning, promotes real-time interaction, and bridges formal and informal learning contexts, seamlessly integrating language learning into daily life (Bozkurt et al., 2021; Hwang et al., 2021).

By bridging formal and informal contexts, MALL seamlessly integrates language learning into daily life, promoting continuity and immersion. It also supports diverse learners, including those with special needs, through tools like audio-visual aids and translation (Caihua Liu et al., 2021). However, despite the potential of both general MALL and AI-driven MALL, university-level EFL instructors face considerable barriers in integrating these approaches into their teaching practices. Technological limitations, such as inadequate infrastructure and technical support, remain significant obstacles. Pedagogical challenges, including aligning mobile learning activities with curriculum objectives and managing classroom dynamics, further complicate the integration process. Institutional support is often insufficient, leaving instructors to address these challenges with limited resources and guidance (An & Williams, 2010; Ertmer et al., 2012; Kopcha, 2012).

Therefore, this study investigates the barriers faced by 399 university EFL instructors in integrating MALL, encompassing both general MALL and AI-driven MALL. It also explores the coping strategies these instructors employ to overcome these challenges. It examines the technological, pedagogical, and institutional obstacles, the relationship between perceived barriers and coping strategies, and how instructors' background characteristics, such as age, professional position, and experience with MALL, shape their integration experiences. This comprehensive approach provides valuable insights into enhancing the adoption of MALL in university-level language instruction. The research questions for this study are as follows:

1. What are the technological, pedagogical, and institutional barriers faced by university EFL instructors in integrating MALL?
2. What coping strategies do university EFL instructors employ to overcome the challenges of integrating MALL into their teaching practices?
3. What is the relationship between the perceived barriers and the coping strategies adopted by university EFL instructors?
4. How do instructors' background characteristics, such as age, professional position, and experience with MALL, influence their experiences and approaches to MALL integration?

LITERATURE REVIEW

Research on Mobile Assisted Language Learning

MALL is an extension of mobile learning that involves using mobile technology to access information and achieve learning objectives which provides a convenient communication channel for learners, peers, and teachers (Viberg & Gronlund, 2013). MALL transcends traditional classroom settings by enabling ubiquitous learning through portable devices. Learners can pursue their language learning goals anytime, anywhere, and in any manner, fostering initiative and autonomy (Sandberg et al., 2011; Sung et al., 2015). By offering diverse tools and resources, MALL enhances learning motivation, interest, and outcomes, while addressing individual differences through tailored learning assistance (Martin-Dorta et al., 2011; Rau et al., 2008).

Recent advancements in technology have further expanded the scope of MALL to include AI-driven innovations, which have enhanced its ability to personalize learning experiences. Scholars increasingly emphasize the role of MALL, including AI-driven MALL, in promoting instructional innovation in higher education to enhance teaching and learning effectiveness (Garcia Botero et al., 2018; Sung et al., 2015). One such innovation is AI-integrated mobile learning systems for English vocabulary have been developed to personalize learning materials, increase learner engagement, and boost effectiveness (Hao et al., 2019; Sandberg et al., 2014). Similarly, research highlights the potential of AI-driven MALL in customizing English reading instruction to individual learners' levels and interests, thereby improving reading comprehension (Gutierrez-Colon et al., 2023; Li, 2022).

Beyond reading comprehension, the scope of MALL research—both general and AI-driven—encompasses innovative approaches such as task-based learning integrated with mobile technologies (Xue, 2022), mobile applications used in authentic environments (Shadiev et al., 2017), and the use of learning management systems like Moodle in mobile contexts (Jia et al., 2012). These studies illustrate the dynamic nature of MALL, showcasing its ability to facilitate interactive, personalized, and technologically integrated approaches to language instruction, thus reflecting the evolving landscape of educational technology and pedagogical practices.

The efficacy of MALL depends on effective utilization of technology to deliver educational content, foster teacher-student interaction, and promote both independent and collaborative learning (Dye et al., 2003). In higher education settings, the widespread use of mobile devices among students to access online learning materials underscores the need for instructors to integrate these tools into formal education (Kukulska-Hulme, 2012). Cheon et al. (2012) further posited that the cornerstone of successful MALL implementation lies in instructors' dedication to designing courses that effectively leverage mobile devices. AI-driven features, such as adaptive learning systems and targeted feedback mechanisms, further enhance the capabilities of MALL in addressing individual learner needs and improving engagement (Karakaya & Bozkurt, 2022).

Despite its recognized pedagogical advantages, the integration of MALL—including AI-driven MALL—into English language teaching faces significant obstacles. These barriers primarily stem from teachers' negative perceptions and practical implementation challenges (Al-Hunaiyyan et al., 2018; Nikolopoulou et al., 2023). The literature also identifies several factors influencing MALL's successful integration, including:

1. Learner behavior and attitudes (Nie et al., 2020; Onal et al., 2022).
2. Technology acceptance among users (Hsu & Lin, 2022).
3. Readiness of both instructors and students (Nariyati & Pratiwi, 2020; Rafiee & Abbasian-Naghneh, 2021).
4. Anxiety levels associated with technology use (Chenchen Liu et al., 2021).
5. Perceptions of MALL's usefulness in language acquisition (Lu et al., 2022).

By addressing these factors, educators and policymakers can create a supportive environment for the successful integration of MALL into English language teaching. This approach will enhance the learning experience for students and maximize the potential of both general and AI-driven MALL to revolutionize language instruction.

Barriers to Instructors' Use of MALL

Currently, many educators' understandings of MALL remain confined to the technological application stage. There exists a discrepancy between teachers' recognition of technology-assisted learning and their actual utilization of technology in instructional practices (An & Williams, 2010). This phenomenon can be attributed to various barriers that educators encounter in implementing technology-assisted teaching, which directly impact their willingness and capability to employ technology for pedagogical purposes (Inan & Lowther, 2010). While extensive research has examined barriers to educational technology, particularly computer-based systems, there is a lack of comprehensive literature addressing the challenges specific to technology-assisted learning and the integration of MALL. Consequently, the following discussion primarily focuses on the barriers associated with technology-assisted learning.

Ertmer (1999) provided one of the earliest and most significant classifications of barriers to the use of computer technology. Ertmer classified these barriers into two primary categories: first-order and second-order barriers. First-order barriers are external and include factors such as inadequate resources, lack of technical support, and insufficient training. These barriers are often tangible and can be addressed through practical solutions like improved infrastructure and professional development. Second-order barriers are internal and relate to educators' beliefs, attitudes, and pedagogical practices. These barriers are more abstract and involve resistance to change, limited understanding of the potential of technology, and ingrained teaching habits. Addressing second-order barriers requires a deeper shift in educators' mindsets and approaches to teaching (Ertmer et al., 2012; Johnson & Tawfik, 2022; Tanaka & Saito, 2021).

Ertmer's framework has been foundational in guiding subsequent research on educational technology integration, highlighting the need to address both external and internal obstacles to effectively support technology use in educational settings. For effective implementation of technology-assisted teaching, educators must address the previously outlined extrinsic factors. The omission of any of these factors can undermine the efficacy and success of technology integration in educational settings. Although extrinsic factors are generally considered less influential than intrinsic factors, their elimination does not necessarily lead to increased technology use among teachers (Ertmer, 1999). Evidence suggests that despite having technological experience, there is no significant improvement in teachers' use of technology in instruction (Hu et al., 2003). However, extrinsic support is crucial for the successful implementation of technology-assisted teaching. Providing the necessary equipment and administrative resources is crucial to prevent initial setbacks in the adoption of technology-assisted teaching practices (Ertmer, 1999).

Intrinsic factors encompass internal personal elements that significantly influence an individual's engagement with and use of technology, especially in educational contexts. Key intrinsic factors include motivation, which drives the individual's interest and commitment to using technology, whether through personal satisfaction or external rewards. Self-efficacy, or an individual's confidence in their ability to effectively use technology, plays a crucial role, with higher self-efficacy often leading to more successful technology integration. Attitudes and beliefs about technology, including perceptions of its usefulness and ease of use, also impact adoption and utilization. Technological competence, or the level of skill and familiarity with technology, affects how effectively it is used. Cognitive styles, or learning preferences, influence interactions with technology, as some individuals may prefer visual or interactive elements. In addition, prior experience with technology can shape comfort levels and openness to new tools. Understanding and addressing these intrinsic factors is essential for designing effective training and support systems that cater to individual needs and enhance technology integration (Sung et al., 2015; Vongkulluksn et al., 2018).

Instructors' Coping Strategies of MALL

Scholars have debated coping strategies in various research contexts, noting different interpretations across different time periods. Early research predominantly focused on the characteristics of good and bad respondents. Over time, the focus shifted towards diverse situations, leading to the development of specific coping strategies. Coping strategies are typically defined as cognitive efforts to alleviate stress, anxiety, threats, fears, or other physical and mental challenges (Weiten et al., 2018). This study defines coping strategies as the methods university English instructors use to manage Mobile-Assisted Language Learning (MALL) when faced with intrinsic and extrinsic barriers that exceed their resources and abilities. These strategies encompass cognitive adjustments and behavioral efforts to address the dynamic processes of such challenges.

The literature on coping strategies specifically for college English instructors' mobile technology-assisted instruction is limited. Ertmer (1999) was among the first to investigate coping strategies in the context of intrinsic and extrinsic barriers to technology integration in teaching. He emphasized that each barrier type requires corresponding coping strategies and that these strategies must consider the interaction between different barrier factors, as they are interrelated. This literature review highlights the need for more research on coping strategies for college English teachers implementing MALL, specifically addressing intrinsic and extrinsic barriers and the multifaceted approaches required to overcome them.

It is crucial to recognize that a single barrier may have multiple corresponding coping strategies. Effective elimination of barriers necessitates the use of various strategies. For promoting technology-assisted teaching, barriers such as changing teaching methods, increasing technology equipment, and providing technical support must be addressed. Additionally, reducing teachers' teaching hours and workload is necessary. Understanding teachers' current perspectives and beliefs about using technology in classroom teaching is also essential (Cuban, 2009).

Teachers' beliefs about teaching are a primary indicator for changing teaching practices (Lumpe & Chambers, 2001). These beliefs can be categorized into capability beliefs and context beliefs, which are key factors affecting teachers' technology-assisted teaching. Capability beliefs refer to teachers' confidence in using technology in their teaching, while context beliefs pertain to their perceived ability to overcome intrinsic barriers to implementing technology-assisted teaching. Most teachers are not accustomed to using

technology in their teaching, and the introduction of technology-assisted teaching presents a significant challenge. When teachers do not understand the effectiveness and benefits that technology-assisted learning can bring to their teaching, they naturally lack confidence and are therefore reluctant to adopt such methods, leading to low effectiveness.

Teachers must be convinced of the potential benefits of technology-assisted teaching for it to become a natural part of their practice (Belland, 2009). Once convinced, teachers are more likely to develop the habit of using technology in their instruction, thereby enhancing its effectiveness. This literature review highlights the importance of addressing both intrinsic and extrinsic barriers and emphasizes the need for multifaceted approaches to promote the integration of technology-assisted teaching. More research is needed to explore the coping strategies of college English teachers in this context, particularly concerning their beliefs and the practical challenges they face.

Current strategies for coping with barriers to technology-assisted teaching primarily focus on providing teachers with the necessary guidance to overcome these obstacles. Teachers need to understand that they do not have to work in isolation but can receive support and assistance whenever needed. This support is crucial in changing teachers' attitudes and achieving more effective technology-assisted teaching (Boulay & Fulford, 2009).

Despite the recognition of these needs, there is a lack of literature that comprehensively summarizes effective coping strategies for technology-assisted teaching. Since 1999, Ertmer has been devoted to discussing intrinsic and extrinsic barriers to the integration of technology into teaching, but only some possible coping strategies have been briefly addressed. Later, Kopcha (2012) proposed a complete list of strategy classifications for elementary school teachers, including aspects such as accessibility, time, administrative technical support, beliefs, and professional development. Kopcha further emphasized that teachers' ability and use of technology in teaching could be gradually improved if psychological factors are addressed. Drawing from the above, college EFL teachers' coping strategies for mobile technology-assisted teaching can adopt a similar classification. These strategies can be differentiated into intrinsic and extrinsic factors to form a comprehensive list.

Currently, there is a significant gap between technology development and the level of technology integration in teaching practices by educators. Studies have indicated that educators frequently utilize technology not for instructional purposes but for administrative tasks (such as keeping grades and attendance records), unrelated matters (such as communicating with colleagues or parents), and, lastly, developing instructional materials (Ertmer, 2005; Gray et al., 2010). Inan and Lowther (2010) indicated that professional development, administrative technical support, and teacher beliefs are the main factors affecting whether teachers integrate technology-assisted teaching in the classroom. Addressing these issues requires analyzing the factors that obstruct the use of technology and formulating targeted solutions to mitigate these impediments. When educators are provided with adequate support and cultivate a belief in the advantages of technology-assisted teaching, they are more inclined to effectively incorporate these methods into their instructional practices (Boulay & Fulford, 2009). This literature review highlights the need for comprehensive research on effective coping strategies for college EFL teachers implementing mobile technology-assisted teaching.

METHOD

Participants

The study comprised 399 EFL instructors from universities across various regions in Taiwan. The sample was predominantly female (N=277, 69.4%), with males constituting 30.6% of the participants. Age distribution indicated that the majority were between 40-49 years (N=174, 43.6%), followed by those aged 50-59 (N=131, 32.8%). Academic positions of participants were categorized as follows: 44.9% were lecturers, 27.1% assistant professors, 17.5% associate professors, and 10.5% full professors. Regarding teaching experience, 45.1% had 11-20 years of experience, while 30.1% had over 21 years. Geographically, participants were distributed with 40.1% from northern Taiwan, 31.6% from central Taiwan, 24.6% from southern Taiwan, and 3.8% from eastern Taiwan. Concerning the daily use of Mobile-Assisted Language Learning (MALL), 39.6% reported using it for less than one hour, 44.4% for 1-2 hours, 16.5% for 3-4 hours, 5.8% for 5-6 hours, and 3.8% for more than 6 hours.

Instrument

The literature review reveals that most scholars classify the barriers to technology-assisted teaching into two categories: extrinsic and intrinsic factors. To align with this framework, the survey questionnaire categorizes the barriers to instructors' use of MALL into two principal categories, providing specific examples to ensure clarity and comprehensiveness. The use of MALL in this study encompasses both general and AI-driven approaches, reflecting the diverse tools and technologies employed in modern language instruction. This includes widely used applications such as Duolingo, Quizlet, Kahoot, etc., which are designed for activities like vocabulary building, interactive quizzes, and collaborative learning. In addition, MALL integrates various devices, including smartphones, tablets, and laptops, enabling flexible and accessible learning opportunities.

Extrinsic factors refer to external challenges beyond the instructors' control. The survey included questions to identify barriers such as:

- Accessibility: The availability and ease of access to necessary technology.
- Technical Support and Training: The availability of technical support and professional development opportunities.
- Time: The time allocated for planning, training, and integrating technology into the curriculum.
- Society and School Culture: The influence of societal norms and institutional culture regarding technology use.
- Student-Related Factors: Student attitudes, behaviors, and readiness for using technology in learning.

Intrinsic barriers are those factors that influence the willingness to utilize MALL in teaching. These include the following subcategories:

- Attitude: Instructors' overall disposition towards using technology in teaching.
- Belief: Instructors' beliefs about the effectiveness and benefits of using technology in their teaching.
- Self-Efficacy of Integration: Instructors' confidence in their capability to incorporate technology successfully into their teaching methodologies.
- Technological Pedagogical Content Knowledge (TPACK): Instructors' comprehension of how to blend technology with pedagogical strategies and subject matter expertise in a cohesive and effective manner.
- Teaching Technique: Instructors' methods and strategies for incorporating technology into their teaching.

The reliability of the survey was established with a Cronbach's alpha coefficient of .956 for the MB section and .957 for the MCS section, indicating high internal consistency. The validity analysis showed a Kaiser-Meyer-Olkin measure of .836 for both sections, demonstrating strong construct validity. Thus, the instrument was validated as both reliable and valid for assessing the barriers and coping strategies associated with MALL among university instructors. A questionnaire was distributed to a random sample of 399 university instructors from various regions in Taiwan. The finalized questionnaire comprised 92 items, organized into two main sections: MALL Barriers (MB) and MALL Coping Strategies (MCS), with 48 items on participants' MB and 48 items on participants' use of MCS. Subsequently, semi-structured interviews were conducted with nine of the instructors. Participants were asked to provide qualitative feedback on their experiences with the applications and devices, including their effectiveness, ease of use, and any barriers encountered.

Procedures and Data Analysis

The participants were briefed on the survey's purpose. An introductory email detailed the study and provided a link to the survey for completion at their convenience. Privacy and data confidentiality were assured, with data retention limited to three years for study purposes. Completed surveys were coded for statistical analysis, enabling comparisons and insights into participants' mobile learning (MB) and mobile communication system (MCS) use. Descriptive statistics, t-tests, and one-way ANOVAs with post-hoc comparisons were employed to identify significant differences among participants based on background characteristics regarding

barriers to MALL implementation. Similar analyses were conducted to assess variations in coping strategy use by gender, age, position, years of teaching, university area, and daily academic MALL integration hours.

For the analysis of MALL barriers and coping strategies, participants were categorized into three levels based on their reported scores. High barriers were defined as scores of 2 or lower, medium barriers as a mean of 2.1-4.0, and low barriers as a mean of 4.1 or higher. Similarly, for coping strategies, high usage was indicated by a mean score of 4.1 or higher, medium by a mean of 2.1-4.0, and low by a score of 2 or lower. These standardized benchmarks facilitated comparisons among participants regarding their perceived barriers to MALL implementation and their utilization of coping strategies. The survey data are not publicly available to protect individuals' privacy in accordance with the Protection Regulation of the National Science and Technology Council in Taiwan.

In addition to quantitative analysis, qualitative data from interviews was analyzed thematically. The thematic analysis involved identifying patterns and themes within the interview transcripts. Participants for the interviews were selected through random sampling from the pool of volunteer survey participants to ensure unbiased representation of instructors. A total of nine participants were chosen from the survey sample, reflecting a range of ages, professional positions, and levels of experience with MALL integration. Semi-structured interviews were conducted to allow for both consistency in addressing key topics and flexibility to explore individual perspectives in depth. The interview questions focused on identifying specific barriers to MALL integration, such as technological limitations, pedagogical challenges, and institutional constraints, as well as the coping strategies employed by instructors to overcome these challenges. Key questions included: "What are the main barriers you face when integrating MALL into your teaching?" "What strategies have you used to address these barriers?"

RESULTS

EFL Instructors' Barriers to Integrating MALL

This section presents an analysis of the perceived barriers to integrating MALL among EFL instructors, focusing on both extrinsic and intrinsic factors. The data provides insights into the challenges faced by instructors in adopting MALL in their teaching practices. As indicated in Table 1, the combined mean score for all barriers was 3.09 (SD = 0.919), reflecting a moderate level of perceived barriers overall. These findings indicate that both extrinsic and intrinsic factors play a significant role in hindering the integration of MALL among EFL instructors. Addressing these barriers through institutional support, targeted training, and fostering positive attitudes towards technology integration is essential for the successful implementation of MALL in EFL settings. Notably, the standard deviations across all categories were relatively high, ranging from 1.14 to 1.36, which indicates considerable variability in participants' responses. The highest-rated individual factors were time (M = 3.79, SD = 1.137), social and school culture (M = 3.53, SD = 1.224), and beliefs (M = 3.34, SD = 1.223). Conversely, the lowest-rated factors were self-efficacy of integration (M = 2.55, SD = 1.165), student-related factors (M = 2.71, SD = 1.200), and technological pedagogical content knowledge and teaching technique (M = 2.84, SD = 1.363).

Extrinsic barriers (M = 3.31, SD = 0.939) were rated higher than Intrinsic factors (M = 2.92, SD = 1.067), suggesting that external obstacles are perceived as more significant in impeding technology integration. The overall mean score for extrinsic barriers indicates a moderate level of perceived obstacles among the instructors. Within the Extrinsic domain, time constraints emerged as the most substantial barrier (M = 3.79, SD = 1.137), followed closely by social and school culture (M = 3.53, SD = 1.22). Accessibility (M = 3.26, SD = 1.274) and technical support and training (M = 3.19, SD = 1.284) were rated moderately high, while student-related factors (M = 2.71, SD = 1.200) were perceived as the least significant extrinsic barrier. In contrast, the overall mean score for intrinsic barriers was 2.92 (SD = 1.067) which although lower than that for extrinsic barriers, still indicates notable concerns. Among Intrinsic factors, beliefs (M = 3.34, SD = 1.223) and attitudes (M = 3.00, SD = 1.228) were rated higher than self-efficacy of integration (M = 2.55, SD = 1.17) and technological pedagogical content knowledge and teaching technique (M = 2.84, SD = 1.363). This hierarchy suggests that personal beliefs and attitudes play a more substantial role in technology integration than perceived competence or pedagogical knowledge.

Interview responses corroborated these findings, providing additional depth to the quantitative data. Many instructors articulated challenges in keeping pace with technological advancements and determining the appropriate application of various technologies. One participant noted, *"The constant updates in apps and devices make it hard to stay current. I often feel like I am always catching up."* Another emphasized, *"Choosing the right app for the right teaching context is overwhelming. There are too many options, and not all are effective."* Moreover, the limited availability of computer-equipped language labs or classrooms was frequently cited as a significant factor contributing to the lack of motivation to adopt MALL in teaching practices. One instructor shared, *"Our institution has only a few computer labs, and scheduling time for my classes is nearly impossible. This makes using technology in teaching more of a burden than a benefit."* Another stated, *"Without proper infrastructure, integrating MALL feels like an unrealistic expectation."* These qualitative insights reinforce the quantitative findings, highlighting the multifaceted challenges that EFL instructors encounter in integrating MALL into their instructional methodologies. These challenges underline the importance of addressing both the technical and motivational aspects of MALL integration to facilitate its effective adoption in educational settings.

Table 1. Perceived Barriers in Integrating among EFL Instructors

Domain/subcategory	M	SD
Extrinsic barrier	3.31	.937
accessibility	3.26	1.274
technical support and training	3.19	1.284
time	3.79	1.137
social and school culture	3.53	1.224
student-related factor	2.71	1.200
Intrinsic factor	2.92	1.067
attitude	3.00	1.228
belief	3.34	1.223
self-efficacy of integration	2.55	1.165
technological pedagogical content knowledge and teaching technique	2.84	1.363
Total	3.09	.919

EFL Instructors' Coping Strategy for Integrating MALL

As indicated in Table 2, Intrinsic factors (M = 4.78, SD = 0.968) were rated significantly higher than extrinsic barriers (M = 3.56, SD = 0.824), suggesting that EFL instructors rely more heavily on personal resources and attributes when coping with MALL integration challenges. Within the intrinsic factor, attitude emerged as the most prominent coping strategy (M = 4.88, SD = 0.976), closely followed by belief (M = 4.83, SD = 1.020). Self-efficacy of integration (M = 4.72, SD = 1.059) and technological pedagogical content knowledge and teaching technique (M = 4.74, SD = 1.045) were also highly rated, indicating that instructors strongly rely on their personal competencies and attitude to overcome integration challenges.

Among extrinsic barriers, student-related factors surprisingly received the highest rating (M = 4.30, SD = 1.185), suggesting that instructors frequently employ strategies that involve or consider their students when dealing with MALL integration. Accessibility strategies were also prominently reported (M = 4.03, SD = 0.972). In contrast, time-related coping strategies were rated lowest (M = 2.61, SD = 1.086), indicating that instructors may struggle most with time management in MALL integration. Technical support and training (M = 3.51, SD = 1.323) and social and school culture (M = 3.31, SD = 1.063) were rated moderately, suggesting that while these are utilized as coping strategies, they are not as prominent as other factors.

The overall mean across all domains was 4.25 (SD = 0.805), indicating that participants generally reported high levels of coping strategy use across both intrinsic and extrinsic domains. The standard deviations across categories ranged from 0.972 to 1.323, suggesting some variability in responses, particularly for technical

support and training strategies. These findings highlight the multifaceted nature of coping strategies employed by EFL instructors in MALL integration. Participants also provided insights into their coping strategies during interviews, complementing the quantitative data. One instructor shared, *"When I face technical issues, I often turn to online forums or my colleagues for solutions. It's not always perfect, but it helps me move forward."* Another explained, *"Engaging students through interactive apps like Kahoot has been a game-changer. It not only makes learning fun but also motivates me to keep experimenting with new tools."*

The results suggest that instructors primarily rely on their personal attitudes, beliefs, and competencies to navigate challenges. As one participant noted, *"I've learned to adapt by staying positive and focusing on what I can control, like planning lessons that are less dependent on technology."* However, they also employ strategies related to student engagement and improving accessibility. For example, an instructor remarked, *"I try to make learning resources accessible through multiple platforms so that students can choose what works best for them."* Moreover, the lower rating for time-related coping strategies may indicate an area where instructors require additional support or skill development. One participant commented, *"Balancing the time needed to prepare MALL-based activities with other teaching responsibilities is exhausting. I wish there were more training sessions on how to streamline these processes."* The contrast between the high ratings for intrinsic factors and the comparatively lower ratings for most extrinsic barriers (except for student-related factors) suggests that EFL instructors may feel more empowered to address challenges through personal growth and adaptation rather than relying on external support systems. This insight could have important implications for professional development programs and institutional support structures for MALL integration in EFL contexts.

Table 2. Reported Coping Strategy of MALL Integration among EFL Instructors

Domain/ subcategory	M	SD
Extrinsic barrier	3.56	.824
accessibility	4.03	.972
technical support and training	3.51	1.323
time	2.61	1.086
social and school culture	3.31	1.063
student-related factor	4.30	1.185
Intrinsic factor	4.78	.968
attitude	4.88	.976
belief	4.83	1.020
self-efficacy of integration	4.72	1.059
technological pedagogical content knowledge and teaching technique	4.74	1.045
Total	4.25	.805

The Correlation of EFL Instructors' Barriers and Coping Strategy of MALL Integration

As seen in Table 3, the Pearson correlation analysis results reveal a strong negative correlation between perceived barriers and reported coping strategies ($r = -0.618$, $p < 0.001$). This suggests that as instructors perceive higher levels of barriers, they tend to report lower levels of coping strategy use, or vice versa.

Extrinsic barriers showed a moderate negative correlation with coping strategies ($r = -0.471$, $p < 0.001$). In addition, extrinsic barriers were negatively correlated with both extrinsic ($r = -0.529$, $p < 0.001$) and intrinsic ($r = -0.347$, $p < 0.001$) coping strategies. Intrinsic barriers demonstrated a stronger negative correlation with coping strategies ($r = -0.623$, $p < 0.001$) compared to extrinsic barriers. Intrinsic barriers were also negatively correlated with both extrinsic ($r = -0.489$, $p < 0.001$) and intrinsic ($r = -0.598$, $p < 0.001$) coping strategies.

Extrinsic and intrinsic barriers demonstrated a significant positive correlation ($r = 0.641$, $p < 0.001$), indicating that instructors who perceive high levels of extrinsic barriers also tend to perceive high levels of intrinsic barriers. Similarly, extrinsic and intrinsic coping strategies were strongly positively correlated ($r = 0.563$, $p < 0.001$), suggesting that instructors who report high use of extrinsic coping strategies also tend to report high use of intrinsic coping strategies.

These findings indicate a complex relationship between perceived barriers and coping strategies in MALL integration among EFL instructors. The strong negative correlations between barriers and coping strategies suggest that instructors who perceive fewer barriers tend to report higher use of coping strategies, or that those who employ more coping strategies perceive fewer barriers. The stronger correlations observed for intrinsic factors (both barriers and coping strategies) compared to extrinsic factors highlight the importance of personal and psychological aspects in MALL integration. This suggests that interventions targeting intrinsic factors might be particularly effective in improving MALL integration among EFL instructors. The strong positive correlations within barrier types and within coping strategy types indicate that these constructs are closely related, suggesting that comprehensive approaches addressing multiple aspects of barriers and coping strategies may be most effective in supporting EFL instructors in MALL integration.

Table 3. Pearson Correlation analysis results of EFL instructors' barriers and coping strategy of MALL integration

	Barrier	Extrinsic	Intrinsic	coping strategies	Extrinsic	Intrinsic
Barrier	1	.865**	.939**	-.618**	-.555**	-.545**
Extrinsic	.865**	1	.641**	-.471**	-.529**	-.347**
Intrinsic	.939**	.641**	1	-.623**	-.489**	-.598**
Coping strategies	-.601**	-.471**	-.623**	1	.829**	.929**
Extrinsic	-.555**	-.529**	-.489**	.829*8	1	.563**
Intrinsic	-.545**	-.347**	-.598**	.929**	.563**	1

**P<0.01

Individual Differences in MALL Integration

To investigate potential gender-based disparities in the perception of barriers to MALL implementation among instructors, an independent-samples t-test was employed. The results are summarized in Table 4. No statistically significant disparity was observed in perceived barriers to MALL between male ($M = 3.09$, $SD = 0.886$) and female instructors ($M = 3.09$, $SD = 0.935$), $t(397) = -0.046$, $p = .964$, 95% CI [-0.201, 0.192]. The identical means and negligible t-value suggest that male and female instructors perceive similar levels of barriers in integrating MALL into their teaching practices.

Similarly, no significant difference was found in the use of coping strategies between male ($M = 4.26$, $SD = 0.867$) and female instructors ($M = 4.25$, $SD = 0.777$), $t(397) = 0.116$, $p = .908$, 95% CI [-0.162, 0.182]. This indicates that both male and female instructors employ comparable levels of coping strategies when integrating MALL into their instruction. The high p-values ($p > .05$) and the confidence intervals that include zero further support the conclusion that there are no statistically significant gender differences in either perceived barriers or coping strategies associated with MALL implementation. These results indicated that gender does not play a significant role in how EFL instructors perceive barriers to MALL integration or in their adoption of coping strategies.

Table 4. Independent t-test results

		M	SD	t	Df	p	95% CI
Barrier	Male	3.09	.886	-.046	397	.964	[-0.201, 0.192]
	Female	3.09	.935				
Coping strategy	Male	4.26	.867	.116	397	.908	[-0.162, 0.182]
	Female	4.25	.777				

Note. N = 350, P < .05.

To examine the effects of individual differences on perceived barriers and coping strategies related to MALL integration among EFL instructors, a series of one-way ANOVAs were conducted. The individual differences examined were age, position, years of teaching experience, area of specialization, and time spent on MALL daily. The results as summarized in Table 5, revealed no statistically significant effects for any of the examined factors on either perceived barriers or coping strategies.

For perceived barriers, the analyses yielded non-significant results for age [F(159, 239) = 1.127, p = .201], position [F(159, 239) = 0.871, p = .827], years of teaching experience [F(159, 239) = 1.164, p = .144], area of specialization [F(143, 255) = 1.061, p = .340], and time spent on MALL daily [F(143, 255) = 1.028, p = .421]. Similarly, for coping strategies, no significant effects were found for age [F(143, 255) = 1.034, p = .404], position [F(143, 255) = 0.924, p = .699], years of teaching experience [F(143, 255) = 0.983, p = .541], area of specialization [F(3, 346) = 1.452, p = .227], or time spent on MALL daily [F(143, 255) = 1.028, p = .421]. These findings suggest that the examined individual differences do not significantly influence EFL instructors' perceptions of barriers or their adoption of coping strategies in MALL integration.

Table 5. ANOVA results

		Source	df	F	p
Age	Barrier	Between	159	1.127	.201
		Within	239		
	Coping strategy	Between	143	1.034	.404
		Within	255		
Position	Barrier	Between	159	.871	.827
		Within	239		
	Coping strategy	Between	143	.924	.699
		Within	255		
Years of teaching experience	Barrier	Between	159	1.164	.144
		Within	239		
	Coping strategy	Between	143	.983	.541
		Within	255		
Area	Barrier	Between	143	1.061	.340
		Within	255		
	Coping strategy	Between	3	1.452	.227
		Within	346		
Time spent on MALL daily	Barrier	Between	143	1.028	.421
		Within	255		
	Coping strategy	Between	143	1.028	.421
		Within	255		

Note. *p < .05.

DISCUSSION

This study investigated the barriers to Mobile Assisted Language Learning (MALL) integration among EFL instructors, their coping strategies, and the relationship between these factors. In addition, it examined the influence of individual differences on perceived barriers and coping strategies. The findings reveal that EFL instructors perceive moderate levels of barriers to MALL integration ($M = 3.09$, $SD = 0.919$), with extrinsic barriers ($M = 3.31$, $SD = 0.939$) rated higher than intrinsic barriers ($M = 2.92$, $SD = 1.067$). This aligns with previous research highlighting the significance of external factors in technology integration (Ertmer et al., 2012). Time constraints emerged as the most substantial barrier, consistent with studies emphasizing the time-intensive nature of technology integration in education (Snoeyink & Ertmer, 2001).

Interestingly, while extrinsic barriers were perceived as more significant, instructors reported higher use of intrinsic coping strategies ($M = 4.78$, $SD = 0.968$) compared to extrinsic ones ($M = 3.56$, $SD = 0.824$). This suggests that EFL instructors primarily rely on personal resources and attributes to overcome MALL integration challenges. The prominence of attitude and belief as coping strategies underscores the importance of psychological factors in technology adoption, as proposed by the Technology Acceptance Model (Davis, 1989).

The strong negative correlation between perceived barriers and coping strategies ($r = -0.618$, $p < 0.001$) indicates a reciprocal relationship. This finding suggests that as instructors develop more coping strategies, they may perceive fewer barriers, or conversely, lower perceived barriers may facilitate the development of coping strategies. This relationship was particularly strong for intrinsic factors, highlighting the crucial role of personal and psychological aspects in MALL integration.

Surprisingly, the study found no significant differences in perceived barriers or coping strategies based on gender, age, position, years of teaching experience, area of specialization, or time spent on MALL daily. This contrasts with some previous studies that have found demographic factors to influence technology integration (Inan & Lowther, 2010). The lack of significant differences suggests that MALL integration challenges and coping mechanisms may be more universal among EFL instructors than previously thought.

These findings have important implications for professional development and institutional support for MALL integration. The reliance on intrinsic coping strategies suggests that programs focusing on building self-efficacy, positive attitudes, and beliefs about technology may be particularly effective. However, the higher perceived extrinsic barriers indicate a need for institutional interventions to address time constraints, improve accessibility, and enhance technical support.

CONCLUSIONS

This study provides valuable insights into the complex interplay between barriers and coping strategies in MALL integration among EFL instructors. The findings highlight the multifaceted nature of challenges faced by instructors and the importance of both personal and institutional factors in successful technology integration. The strong negative correlation between barriers and coping strategies suggests that interventions targeting either aspect could have cascading positive effects. The prominence of intrinsic coping strategies, despite higher perceived extrinsic barriers, indicates a need for a balanced approach in supporting MALL integration, addressing both personal and institutional factors.

This study highlights the importance of identifying barriers faced by instructors and examining the coping strategies they use, rather than simply directing them to integrate MALL without adequate support. Instructors noted that while universities often provide sufficient equipment, software, and training, time remains a critical factor due to the rapid pace of mobile technology advancements. Reducing faculty workloads could facilitate more effective MALL implementation. Despite these challenges, instructors generally recognize the benefits of MALL and strive to adopt it. Future research should explore the role of institutional support in MALL adoption, examine the long-term effects on teaching practices and student outcomes, and develop targeted interventions to address the specific challenges EFL instructors face during the early stages of MALL implementation.

The lack of significant differences based on individual characteristics suggests that support strategies for MALL integration could be broadly applicable across different instructor profiles. However, this also indicates a need for further research to identify other factors that may influence MALL integration success. Future research could explore the causal relationships between barriers and coping strategies, potentially through longitudinal studies. In conclusion, this study contributes to a comprehensive understanding of the challenges and strategies involved in MALL integration among EFL instructors. It highlights the importance of a holistic approach to supporting technology integration, addressing both extrinsic barriers and intrinsic coping mechanisms to enhance the adoption and effectiveness of MALL in language teaching.

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REFERENCES

Al-Hunaiyyan, A., Alhajri, R. A., & Al-Sharhan, S. (2018). Perceptions and challenges of mobile learning in Kuwait. *Journal of King Saud University - Computer and Information Sciences*, *30*(2), 279-289. https://doi.org/https://doi.org/10.1016/j.jksuci.2016.12.001

Alam, A., & Mohanty, A. (2023). Educational technology: Exploring the convergence of technology and pedagogy through mobility, interactivity, AI, and learning tools. *Cogent Engineering*, *10*(2), 2283282. https://doi.org/10.1080/23311916.2023.2283282

An, Y.-J., & Williams, K. (2010). Teaching with web 2.0 technologies: Benefits, barriers and lessons learned. *International Journal of Instructional Technology and Distance Learning*, *7*(3), 41-58. http://www.aect.org/pdf/proceedings09/2009/09_1.pdf

Belland, B. R. (2009). Using the theory of habitus to move beyond the study of barriers to technology integration. *Computers & Education*, *52*(2), 353-364. https://doi.org/https://doi.org/10.1016/j.compedu.2008.09.004

Boulay, R. A., & Fulford, C. P. (2009). Technology mentoring: Research results across seven campuses. In A. Tatnall & A. Jones (Eds.), *Education and Technology for a Better World: 9th IFIP TC 3 World Conference on Computers in Education, WCCE 2009, Bento Goncalves, Brazil, July 27-31, 2009. Proceedings* (pp. 273-281). Springer Berlin Heidelberg. https://doi.org/10.1007/978-3-642-03115-1_29

Bozkurt, A., Karadeniz, A., Baneres, D., Guerrero-Roldan, A. E., & Rodriguez, M. E. (2021). Artificial Intelligence and Reflections from Educational Landscape: A Review of AI Studies in Half a Century. *Sustainability*, *13*(2), 800. https://www.mdpi.com/2071-1050/13/2/800

Cheon, J., Lee, S., Crooks, S. M., & Song, J. (2012). An investigation of mobile learning readiness in higher education based on the theory of planned behavior. *Computers & Education*, *59*(3), 1054-1064. https://doi.org/http://dx.doi.org/10.1016/j.compedu.2012.04.015

Cuban, L. (2009). *Oversold and underused computers in the classroom*. Harvard University Press. https://books.google.com.tw/books?id=sdSutyVQfzYC

Davis, F. D. (1989). Technology acceptance model: TAM. *Al-Suqri, MN, Al-Aufi, AS: Information Seeking Behavior and Technology Adoption*, *205*, 219.

Dye, A., Solstad, B. E., K., & Odingo, J. A. (2003). *Mobile education -a glance at the future*. NKI Nettstudier website. http://nettskolen.nki.no/forskning/mobile_education.pdf

Ertmer, P. A. (1999). Addressing first- and second-order barriers to change: Strategies for technology integration. *Educational Technology Research and Development*, *47*(4), 47-61. https://doi.org/10.1007/bf02299597

Ertmer, P. A. (2005). Teacher pedagogical beliefs: The final frontier in our quest for technology integration? *Educational Technology Research and Development*, *53*(4), 25-39. https://doi.org/10.1007/bf02504683

Ertmer, P. A., Ottenbreit-Leftwich, A. T., Sadik, O., Sendurur, E., & Sendurur, P. (2012). Teacher beliefs and technology integration practices: A critical relationship. *Computers & Education*, *59*(2), 423-435. https://doi.org/10.1016/j.compedu.2012.02.001

Garcia Botero, G., Questier, F., Cincinnato, S., He, T., & Zhu, C. (2018). Acceptance and usage of mobile assisted language learning by higher education students. *Journal of Computing in Higher Education*, *30*(3), 426-451. https://doi.org/10.1007/s12528-018-9177-1

Gray, L., Thomas, N., & Lewis, L. (2010). *Teachers' use of educational technology in US public schools: 2009 (NCES 2010-040)*. National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education.

Gutierrez-Colon, M., Frumuselu, A. D., & Curell, H. (2023). Mobile-assisted Language learning to enhance L2 reading comprehension: a selection of implementation studies between 2012–2017. *Interactive Learning Environments*, *31*(2), 854-862. https://doi.org/10.1080/10494820.2020.1813179

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. https://doi.org/https://doi.org/10.1016/j.chb.2018.10.013

Hsu, C.-K., Hwang, G.-J., & Chang, C.-K. (2013). A personalized recommendation-based mobile learning approach to improving the reading performance of EFL students. *Computers & Education*, *63*, 327-336. https://doi.org/10.1016/j.compedu.2012.12.004

Hsu, H.-T., & Lin, C.-C. (2022). Extending the technology acceptance model of college learners' mobile-assisted language learning by incorporating psychological constructs. *British Journal of Educational Technology*, *53*(2), 286-306. https://doi.org/https://doi.org/10.1111/bjet.13165

Hu, P. J.-H., Clark, T. H. K., & Ma, W. W. (2003). Examining technology acceptance by school teachers: a longitudinal study. *Information & Management*, *41*(2), 227-241. https://doi.org/10.1016/s0378-7206(03)00050-8

Hwang, G.-J., Tu, Y.-F., & Lin, C.-J. (2021). Advancements and hot research topics of artificial intelligence in mobile learning: a review of journal publications from 1995 to 2019. *International Journal of Mobile Learning and Organisation*, *15*(4), 427-447. https://doi.org/10.1504/ijmlo.2021.118444

Inan, F. A., & Lowther, D. L. (2010). Laptops in the K-12 classrooms: Exploring factors impacting instructional use. *Computers & Education*, *55*(3), 937-944. https://doi.org/https://doi.org/10.1016/j.compedu.2010.04.004

Jia, J., Chen, Y., Ding, Z., & Ruan, M. (2012). Effects of a vocabulary acquisition and assessment system on students' performance in a blended learning class for English subject. *Computers & Education*, *58*(1), 63-76. https://doi.org/http://dx.doi.org/10.1016/j.compedu.2011.08.002

Johnson, B. T., & Tawfik, A. A. (2022). First, second, and third-order barriers to information literacy and inquiry-based learning for teachers in poverty contexts. *Educational Technology Research and Development*, *70*(4), 1221-1246. https://doi.org/10.1007/s11423-022-10124-w

Karakaya, K., & Bozkurt, A. (2022). Mobile-assisted language learning (MALL) research trends and patterns through bibliometric analysis: Empowering language learners through ubiquitous educational technologies. *System*, *110*, 102925. https://doi.org/https://doi.org/10.1016/j.system.2022.102925

Kim, N.-Y. (2022). AI-Integrated Mobile-Assisted Language Learning: Is It an Effective Way of Preparing for the TOEIC Test in Classroom Environments? *English Teaching*, *77*(3), 79-102.

Kopcha, T. J. (2012). Teachers' perceptions of the barriers to technology integration and practices with technology under situated professional development. *Computers & Education*, *59*(4), 1109-1121. https://doi.org/10.1016/j.compedu.2012.05.014

Kukulska-Hulme, A. (2012). How should the higher education workforce adapt to advancements in technology for teaching and learning? *The Internet and Higher Education*, *15*(4), 247-254. https://doi.org/10.1016/j.iheduc.2011.12.002

Li, R. (2022). Effects of Mobile-Assisted Language Learning on EFL/ESL Reading Comprehension. *Educational Technology & Society*, *25*(3), 15-29. https://www.jstor.org/stable/48673721

Liu, C., He, J., Ding, C., Fan, X., Hwang, G.-J., & Zhang, Y. (2021). Self-oriented learning perfectionism and English learning burnout among EFL learners using mobile applications: The mediating roles of English learning anxiety and grit. *Learning and Individual Differences*, *88*, 102011. https://doi.org/https://doi.org/10.1016/j.lindif.2021.102011

Liu, C., Zowghi, D., Kearney, M., & Bano, M. (2021). Inquiry-based mobile learning in secondary school science education: A systematic review. *Journal of Computer Assisted Learning*, *37*(1), 1-23.

Lu, A., Deng, R., Huang, Y., Song, T., Shen, Y., Fan, Z., & Zhang, J. (2022). The roles of mobile app perceived usefulness and perceived ease of use in app-based Chinese and English learning flow and satisfaction. *Education and Information Technologies*, *27*(7), 10349-10370. https://doi.org/10.1007/s10639-022-11036-1

Lumpe, A. T., & Chambers, E. (2001). Assessing Teachers' Context Beliefs about Technology Use. *Journal of Research on Technology in Education*, *34*(1), 93-107. https://doi.org/10.1080/15391523.2001.10782337

Martin-Dorta, N., Saorin, J. L., & Contero, M. (2011). Web-based Spatial Training Using Handheld Touch Screen Devices. *Journal of Educational Technology & Society*, *14*(3), 163-177. http://www.jstor.org/stable/jeductechsoci.14.3.163

Nariyati, N. P. L., & Pratiwi, N. (2020). EFL Pre-Service Teachers' Perception toward the Use of Mobile Assisted Language Learning in Teaching English. *International Journal of Language Education*, *4*(1), 38-47.

Nie, J., Zheng, C., Zeng, P., Zhou, B., Lei, L., & Wang, P. (2020). Using the theory of planned behavior and the role of social image to understand mobile English learning check-in behavior. *Computers & Education*, *156*, 103942. https://doi.org/https://doi.org/10.1016/j.compedu.2020.103942

Nikolopoulou, K., Gialamas, V., & Lavidas, K. (2023). Mobile learning-technology barriers in school education: teachers' views. *Technology, Pedagogy and Education*, *32*(1), 29-44. https://doi.org/10.1080/1475939X.2022.2121314

Onal, N., Cevik, K. K., & Senol, V. (2022). The effect of SOS Table learning environment on mobile learning tools acceptance, motivation and mobile learning attitude in English language learning. *Interactive Learning Environments*, *30*(5), 834-847. https://doi.org/10.1080/10494820.2019.1690529

Rafiee, M., & Abbasian-Naghneh, S. (2021). E-learning: development of a model to assess the acceptance and readiness of technology among language learners. *Computer Assisted Language Learning*, *34*(5-6), 730-750. https://doi.org/10.1080/09588221.2019.1640255

Rau, P.-L. P., Gao, Q., & Wu, L.-M. (2008). Using mobile communication technology in high school education: Motivation, pressure, and learning performance. *Computers & Education*, *50*(1), 1-22. https://doi.org/10.1016/j.compedu.2006.03.008

Sandberg, J., Maris, M., & de Geus, K. (2011). Mobile English learning: An evidence-based study with fifth graders. *Computers & Education*, *57*(1), 1334-1347. https://doi.org/10.1016/j.compedu.2011.01.015

Sandberg, J., Maris, M., & Hoogendoorn, P. (2014). The added value of a gaming context and intelligent adaptation for a mobile learning application for vocabulary learning. *Computers & Education*, *76*, 119-130. https://doi.org/https://doi.org/10.1016/j.compedu.2014.03.006

Shadiev, R., Hwang, W.-Y., & Huang, Y.-M. (2017). Review of research on mobile language learning in authentic environments. *Computer Assisted Language Learning*, *30*(3-4), 284-303. https://doi.org/10.1080/09588221.2017.1308383

Snoeyink, R., & Ertmer, P. A. (2001). Thrust into technology: How veteran teachers respond. *Journal of educational technology systems*, *30*(1), 85-111.

Sung, Y.-T., Chang, K.-E., & Yang, J.-M. (2015). How effective are mobile devices for language learning? A meta-analysis. *Educational Research Review*, *16*, 68-84. https://doi.org/https://doi.org/10.1016/j.edurev.2015.09.001

Tanaka, S., & Saito, E. (2021). Examining the barriers experienced by EFL teachers when implementing technology in senior secondary schools in Japan: a self-study. *PRACTICE*, *3*(2), 96-109. https://doi.org/10.1080/25783858.2021.1968281

Viberg, O., & Gronlund, Å. (2013). Cross-cultural analysis of users' attitudes toward the use of mobile devices. *Computers & Education*, *69*, 169-180. https://doi.org/10.1016/j.compedu.2013.07.014

Vongkulluksn, V. W., Xie, K., & Bowman, M. A. (2018). The role of value on teachers' internalization of external barriers and externalization of personal beliefs for classroom technology integration. *Computers & Education*, *118*, 70-81. https://doi.org/https://doi.org/10.1016/j.compedu.2017.11.009

Weiten, W. D., Dunn, D. S., & Hammer, E. Y. (2018). *Psychology Applied to Modern Life, Adjustment in the 21st*. Cengage Learning.

Xue, S. (2022). A conceptual model for integrating affordances of mobile technologies into task-based language teaching. *Interactive Learning Environments*, *30*(6), 1131-1144. https://doi.org/10.1080/10494820.2019.1711132