

## **Mobile-Assisted Language Learning (MALL) for Higher Education Instructional Practices in EFL/ESL Contexts: A Recent Review of Literature**

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### **Abstract**

Mobile technology has steadily gained popularity in EFL/ESL classrooms as instructional media over the last decade. As an effort to present a review of the current empirical studies and propose the potential areas for future studies on Mobile-Assisted Language Learning (MALL), this review paper reports on the pedagogical benefits and issues on MALL application within ESL/EFL contexts with the major focus on higher education. Searching on several more-referred technology-based language instruction journals comprising CALL-EJ, RECALL, and LLT coupled with databases such as ERIC, ProQuest, EBSCO, and Google Scholar, 25 empirical research articles were collected from 2016-2020 based on selected criteria. This paper summarizes the employed frameworks, objectives, methodology, and MALL tools. The results showed that previous studies employed various theoretical and conceptual frameworks such as Zone of Proximal Development (ZPD), Technology Acceptance Model (TAM), and The Community of Inquiry (CoI). The majority of the studies focused on the effectiveness of MALL on students' language proficiency development, which further revealed their pedagogical benefits and perceptions, as well as emerging issues for learning implementation. This review further discussed pedagogical implications that were formulated based on the findings of the previous studies along with the indications of the potential areas in MALL implementation for EFL/ESL contexts.

*Keywords:* MALL, ESL/EFL, higher education, review

### **Introduction**

The development of technology has changed the face of language instruction through Mobile-Assisted Language Learning (MALL) over the last decade. Kukulska-Hulme, (2013) defines MALL as harnessing mobile technologies such as smartphones, tablets, or laptops due to their portability and capability to accommodate spontaneous and personal modes of language learning. The use of handheld devices such as laptops, tablets, and even mobile phones opens a possibility for improved and easier access to extensive, practical, and multi-context learning spontaneity (Kukulska-Hulme & Shields, 2008; Huang et al., 2012). Teachers are now able to construct an extensive model of instruction

allowing students to interact and engage in a learning discussion after school hours (Pachler et al., 2012; Hsu et al., 2013). Students can be more prepared with access to materials for the upcoming discussion (Boix Mansilla & Jackson, 2011). This technology offers the possibility of a more personalized form of learning that merges the student's needs with a MALL device suited to the student's learning styles (Yuniarti (2014; Martin & Ertzberger, 2016). Furthermore, it can serve as a supporting asset for the current learning practice with newly developed innovation through a learning network that allows collaborative, outdoor, and gamified learning models.

MALL includes several traits that are deemed essential to facilitate meaningful learning activities. Several studies highlighted the combination of practicality and engagement as crucial elements of mobile language learning. Practicality refers to the idea that students are recently becoming more familiar with the use of mobile devices, especially smartphones (Brooks, 2016). Moreover, more mobile application software is specially developed for language learning purposes that incorporates and combines ideas from teachers or educational practitioners (Sandberg et al., 2011; Georgiev et al., 2004; Huang et al., 2016). This learning technology is continually updating and upgrading to present more features that increase its attractiveness. Engagement means that mobile learning makes it possible for an instructor to create space for students to engage in thematic interactions designed as a supplement for classroom meetings. MALL allows students to practice their language and develop their proficiency to actively participate in a process of socialization (Delambo et al., 2011). Furthermore, it offers practical assistance for students to put what they learn into practice in a real-world setting through a scientific learning approach (Taradi & Taradi, 2016). Considering the pedagogical benefit, other studies have been carried out to draw effective strategies and emerging threats for utilizing mobile technology in language teaching.

While various reviews on MALL studies have been reported (e.g., Afzali et al., 2017; Yang, 2013; Viberg & Grönlund, 2012), they present a broad context that requires further investigation on the areas of study including learning collaboration and learner's autonomy. Furthermore, the current studies employ different strategies of MALL application with diverse technological platforms and theoretical framework. Therefore, this article serves to provide a review of the latest studies of MALL application in EFL/ESL settings within the scope of higher educations. It further suggests the pedagogical, theoretical, and research implementation of MALL based on the findings and proposes views on the directions of future studies.

The following questions are formulated as an outline to address these objectives of this review.

1. What are the pedagogical/theoretical frameworks adopted in the previous studies?
2. What are the research methodologies including technological tools used to design studies of MALL?
3. What are the educational outcomes arising from the application of MALL?
4. What are the possible barriers to implement MALL?
5. What are the pedagogical, theoretical, and research implications of Mobile assisted language learning based on previous studies?

## **Method**

Several papers were electronically collected from the most referred instructional technology journals comprising CALL-EJ, RECALL, LLT. Additional papers have been retrieved from databases such as the Education Resources Information Center (ERIC), Proquest, EBSCO, and Google Scholar. These databases are the most referred to for the area of technology-based instruction and social studies. The keywords for the search comprised “MALL”, “mobile”, “applications”, “language learning”, “EFL”, “ESL”, “college”, and “higher education”. The collected papers were then selected based on several criteria to present a quality result and sustain the novelty of the findings:

- Being empirical studies
- Addressing the application MALL
- Having been conducted in EFL/ESL contexts
- Published in the English language
- Issued in SCOPUS-indexed journals to address quality of the publication
- Published between 2016 and 2020 (covering the last five years publication to include an extensive range of tools as well as diverse language skills)

The extensive search resulted in 25 papers that met the criteria of this review. The selected articles were then analyzed both inductively and guided by previous literature. Specifically, the articles were critically read, analyzed, and grouped into several themes. Throughout the review process, each paper was revisited continuously for verifying and extracting relevant information. Additionally, this review also includes information presented in non-empirical studies that are deemed necessary to support the pedagogical claim of the previous studies and further serves as a support to formulate the pedagogical implication. For instance, Metruk (2020) presented a literature review concerning the emerging threats of MALL involving teacher’s preparation, cheating, and learning interruption.

**Table 1**

*Distribution of reviewed studies based on Journal references*

| Journal reference                           | # of articles | Study (N=25)  |
|---|---------------|---|
| CALL EJ                                     | 11            | Chang (2020), Ngui et al. (2020), Reynolds and Taylor (2020), Wu (2019), Vaezi et al. (2019), Cárdenas-Moncada et al. (2020), Yu (2018), Bailey (2019), Bailey et al. (2017), Alharbi (2019), Le (2020) |
| RECALL                                      | 1             | Lai and Zeng (2018)   |
| LLT   | 3             | Grimshaw and Cardoso (2018), Liu (2016), and Li and Cummins (2019)  |
| iJET  | 1             | Albadry (2017)  |
| Cogent Education                            | 1             | Ataeifar et al. (2019)  |
| Universal Access in the Information Society | 2             | Chang et al. (2016) and Chen (2016)   |
| Smart Learning Environments                 | 1             | Fang et al. (2018)  |
| The journal of AsiaTEFL                     | 1             | Chen and Lin (2018)   |

|                                       |   |                          |
|---------------------------------------|---|--------------------------|
| Journal of Language and Education     | 1 | Hazaea and Alzubi (2018) |
| Journal of Computer Assisted Learning | 1 | Kurt and Bensen (2017)   |
| International Journal of Instruction  | 1 | Naderi and Akrami (2018) |
| Computers in Human Behavior           | 1 | Chen Hsieh et al. (2017) |

## Findings and Discussion

The search resulted in 25 empirical articles that suit the criteria of this review. An illustrative table (Table 2) is used to present the schema of the article based on the previously mentioned five research questions. Detailed information of the reviewed studies is provided through a matrix that presents the framework, topic, design, and participant.

### Matrix of the current research

A total of 25 articles were analyzed. Next, this review presents the elements of these studies comprising the framework, topic, implementation, design, and participant.

**Table 2**

*Distribution of reviewed articles*

| Study                  | Theoretical, pedagogical framework | Topic  | MALL implementation (Tools)                      | Design of the study, Instruments  | Participant  |
|------------------------|------------------------------------|--|--|---|--|
| Albadry (2017)         | Socio-cultural theory              | The effect of tablet devices in Collaborative Learning   | iPad, the iBook                                  | Case study using learning diaries, focus group interviews, and online log files                   | 21 female university students majoring in computer science in Saudi Arabia |
| Ataeifar et al. (2019) | N/A                                | Students' perceptions of the impact of mobile-assisted instruction on students' oral proficiency | Smartphones, tablets<br>Voice Thread and Twitter | True experimental design coupled with a mixed-method approach using speaking tests and interviews | 110 EFL Iranian sophomore students majoring in English translation         |
| Chang et al. (2016)    | Cognitive load theory              | The effect of M-IPG learning   | Smartphones, tablets                             | Quasi-experimental design coupled   | 137 second-year students from a  |

|                          |  |   |  |  |   |
|--------------------------|--|---|--|--|---|
| Chen (2016)              | N/A  | method on the EFL/L2 students' learning achievement EFL instructors' and students' perceptions and acceptance toward M-learning in higher education | Mobile game Educators<br><br>N/A   | with a mixed-method approach using tests and interviews<br>Case study using questionnaires                                 | university in Taiwan<br><br>52 instructor and 319 students in Taiwan                      |
| Chen and Lin (2018)      | Technology-mediated TBLT   | The mobile-assisted task as a type of technology-mediated TBLT to foster second language (L2) English learning                                      | Laptops, tablets, smartphones Moodle   | Case study using Questionnaires  | 20 Freshman at a public university in northern Taiwan                                     |
| Fang et al. (2018)       | Social constructivist theory, the Zone of Proximal Development (ZPD) | The effect of mobile-assisted peer feedback   | Tablets<br><br>Specified mobile application for the project                            | Quasi-experimental design using oral production tests  | 40 EFL students of a vocational university in Taiwan                                      |
| Hazaea and Alzubi (2018) | Learner Autonomy   | Learner Autonomy (LA) in the EFL reading context  | Smartphones, tablets<br><br>WhatsApp and internet search engines such as Google search | Qualitative action research using students' portfolios, a semi-structured interview, and WhatsApp group chat transcription | 30 male students of a University in Saudi Arabia whose age ranged from 18 to 20 years old |
| Kurt and Bensen (2017)   | Smartphones in language learning                                     | The effects of Vine vocabulary videos in English  | Laptops<br><br>Vine Vocabulary Videos  | quasi-experimental study coupled with a mixed-method approach using  | 32 students of a private university in North Cyprus whose ages ranged from                |

|                            |                                       |   |                                       |   |  |
|----------------------------|---------------------------------------|---|---------------------------------------|---|--|
|                            |                                       | vocabulary learning   |                                       | a vocabulary test and Semi-structured interviews  | 18 to 22 years old   |
| Naderi and Akrami (2018)   | N/A                                   | The impact of Telegram groups on students' reading comprehension                              | Telegram                              | Quantitative quasi-experimental design using An English proficiency test, a reading comprehension test, and textbook passages | 103 students consisting of 55 females and 48 males whose ages ranged from 19 to 46 years old |
| Chen Hsieh et al. (2017)   | The Technology Acceptance Model (TAM) | EFL students' technological acceptance  | Smartphones, tablets<br>LINE          | Action research coupled with a mixed-method approach using tests of oral proficiency, questionnaires, interviews              | 42 sophomores in central Taiwan whose ages ranged from 20 to 21 years old                    |
| Reynolds and Taylor (2020) | N/A                                   | The efficacy of Kahoot! while simultaneously evaluating the implementation of the application | Smartphones, tablets, Kahoot!         | Quasi-experimental design coupled with a mixed-method approach using a survey and focus group discussion                      | 94 second and third-year English majored South Korean university students                    |
| Ngui, et al. (2020)        | N/A                                   | The impact of implementing e-Portfolio as an assessment tool contributed to writing skills.   | Laptops<br>e-Portfolio                | Case study coupled with a mixed-method approach using open-ended questionnaires, and interviews                               | 46 undergraduate students at a public university in Malaysia                                 |
| Chang (2020)               | Constructivism                        | Solutions to decrease lower achievers' English  | Smartphones, tablets, laptops<br>Blog | Case study coupled with a mixed-method approach using essays, the   | 25 non-English majored students at a national  |

|                                |  |  |  |  |  |
|--------------------------------|--|--|--|--|--|
| Alharbi (2019)                 | Input hypothesis, Input-based and production-based instructional approach, sociocultural theory. | writing difficulties by using blogs<br>Videos posted in a blog to teach grammar                        | Smartphones, tablets, laptops<br>Video, Blog | ESLCP, a blog space, Blogger, and interviews<br>True experimental design coupled with a mixed-method approach using a pre-test and post-test, online commentary exchanges, and interviews. | university in eastern Taiwan<br>60 Male undergraduates at a Saudi Arabian university whose ages ranged from 18 to 23 years old |
| Bailey et al. (2017)           | Constructivist theories  | Facebook for Language Learning (FBLL) and identified Facebook participation patterns                   | Facebook                                     | Case study coupled with a mixed-method approach using class discussions, and an FBLL perceptions survey.   | 26 students from a South Korean university   |
| Bailey (2019)                  | Constructivist theories, Sociocultural theory.   | Social networking for language learning participation in relation to task value and L2 writing anxiety | Social network                               | Case study using an adjective-description checklist  | 78 second and third-year South Korean university students comprising 48 females and 30 males                                   |
| Cárdenas-Moncada et al. (2020) | Digital Game-based Language Learning   | The impact of a digital game-based student response system on students' English language learning      | digital game-based student response system   | Quasi-experimental design using pretest-posttest, A survey   | 50 Chilean students undertaking an ESP course whose ages ranged from 18 to 56 years old  |

|                             |  |  |                                    |  |   |
|-----------------------------|--|--|------------------------------------|--|---|
| Vaezi et al. (2019)         | Zone of proximal development (ZPD) theory, constructivism            | Flipped teaching for students' listening performance                               | Online audio materials             | Quasi-Experimental design using a pretest, a posttest, and a delayed posttest                                    | 119 advanced English language learners whose ages ranged from 19 to 37 years old                      |
| Wu (2019)                   | N/A  | EFL students' previous use of MALL   | Wechat                             | Case study coupled with a mixed-method approach using survey questionnaires and Wechat group discussion          | 235 Chinese university students   |
| Yu (2018)                   | Constructivist theories  | Facebook and Learners' participation   | Facebook                           | Case study coupled with a mixed-method approach using a survey, Facebook postings, questionnaire, and interviews | 16 university students comprising 4 males and 12 females in central Taiwan                            |
| Liu (2016)                  | Dual-coding model, Cognitive load theory, Cognitivism                | Strategies by using mobile phones and technology to facilitate vocabulary learning | Instant Messages                   | Quasi-experimental design using a pretest, post-test, and delayed post-test                                      | 100 Taiwanese freshmen whose ages ranged from 18 to 22 years old                                      |
| Grimshaw and Cardoso (2018) | Fluency development activity as outlined by Nation and Newton (2008) | Mobile game Spaceteam ESL for language fluency                                     | Spaceteam ESL                      | Quasi-experimental design coupled with a mixed-method approach using tests and interviews                        | 20 ESL students of a college in Quebec, Canada. The sample as a whole was relatively young (M = 21.4) |
| Li and Cummins (2019)       | N/A  | Text messages for academic vocabulary acquisition                                  | Smartphones, tablets, Text message | Quasi-experimental design using tests  | 108 undergraduate ELLs in a Canadian university   |

|                      |   |   |  |   |  |
|----------------------|---|---|--|---|--|
|                      |   |   |  |   | whose ages ranged from 18 to 25 years old                        |
| Lai and Zheng (2018) | Self-directed mobile language learning in out-of-class learning contexts. | Language learners' self-directed use of mobile devices beyond the classroom | Mobile devices Smartphones, tablets, laptops | Case study coupled with a mixed-method approach using questionnaires and semi-structured interviews                     | 256 learners at around 20 years old of a university in Hong Kong |
| Le (2020)            | TPACK, SAMR   | Digital Storytelling (DST) for learning pleasure                            | Smartphones, tablets, Puppet Pals app        | Case study coupled with a mixed-method approach using The Foreign Language Enjoyment Scale, field notes, and interviews | 69 freshmen at Van Lang University in Vietnam                    |

## Theoretical frameworks

This article indicates the implementation of various theoretical frameworks. Five studies were explicitly framed under constructivism which believes that learners personally construct meaning through experience, and that meaning is influenced by the interaction of prior knowledge and new events (Vaezi et al., 2019, Chang, 2020; Yu, 2018, Bailey et al., 2017; Bailey, 2019). A study by Fang et al. (2018) was developed from the socio-constructivist theory which views learning as a process in which students are guided through collaborative activities to manifest their concepts or knowledge. MALL bridges interaction of students that reflects the social interaction based on designated contexts. It can increase the frequency of interactions that contributes to the development of their language competence and performance. Furthermore, the socio-cultural theory was incorporated in the other three studies (Albadry, 2017; Alharbi, 2019; Bailey, 2019). This theory posits that learners' mental function can be developed through their active engagement in culturally structured learning activities that utilize cultural pedagogical tools as well as materials aside from communicating with more capable others (Lantolf & Thorne, 2009). In addition to sociocultural theory, Alharbi (2019) referred to the input hypothesis as well as the input-based and production-based instructional approach as the framework of a study regarding blogs as a medium to teach grammar. The input hypothesis underlines the significance of language input to students through direct exposure to optimally develop their language competence.

In the same vein, Fang et al. (2018) and Vaezi et al. (2019) framed their studies around Vygotsky's Zone of Proximal Development. This concept explains that students

need to construct their concepts of knowledge and skills through additional guidance in social and collaborative interaction. Essentially, this theory explains that a gap exists between what language learners can learn individually and what they can learn collaboratively with the help of the instructor or a more proficient partner, suggesting that learners achieve beyond what they can do individually (Fang et al, 2018; Vaezi et al, 2019).

Another study reported the use of the Technology Acceptance Model (TAM) developed by Davis et al. (1989) as the theoretical framework. Chen Hsieh et al. (2017) employed this model in their attempt to investigate students' acceptance of mobile technology support in instructional practices. This model is considered compatible with the study as it could be potentially used to investigate the pedagogical benefits of the selected technology. Additionally, TAM allows language instructors to formulate effective instructional models that can optimally harness the potential of technology.

A study by Le (2020) is grounded on TPACK (Technological Pedagogical Content Knowledge) and the SAMR model (Substitution, Augmentation, Modification, Redefinition). TPACK serves as a framework that combines three main competencies that teachers should possess to adopt technology in their instruction: technology, pedagogy, and content (Le, 2020). The SAMR model was developed to assist students in visualizing multifaceted concepts (Le, 2020; Puentedura,2010). Le (2020) manifested the concept through a mobile application that utilized an avatar-based digital role-play.

Liu (2016), in a study about concept maps, incorporated a dual-coding model that activates working memory through visual mapping and audio input processes coupled with cognitive load theory, which is concerned with the language input processing capacity of working memory. This study suggests that concept mapping can decrease mental effort and optimize learning by directing students' learning focus. Additionally, Grimshaw and Cardoso (2018) made an attempt to examine A mobile application namely Spaceteam ESL based on a fluency development activity that was promoted by Nation and Newton (2008). This model emphasizes the essence of real-time processing to promote language fluency through a balanced proportion of meaning-focused input, meaning-focused output, form-focused activities, and fluency-oriented activities.

## **Research Designs**

The reviewed empirical studies utilized various research designs that are dominated by the use of experimental study design. This design was combined with either the quantitative approach or mixed-method approach attempting to examine the effectiveness of MALL. For instance, Naderi and Akrami (2018) applied the quantitative approach in a quasi-experimental design to examine the application of Telegram in teaching reading, which extends to the effects on gender differences. Another design was found in a study conducted by Albadry (2017) who utilized a qualitative approach in a case study by collecting students' learning diaries, conducting focus group interviews, and analyzing the collected online log files. Some studies employed a mixed-method approach by combining various instruments to collect quantitative and qualitative data. For example, Bailey et al. (2017) attempted to examine the use of Facebook for EFL instruction and investigated how students participated in the lesson through this medium. The case study utilized both class discussions and an FBLL (Facebook for Language Learning) perceptions survey to collect both quantitative and qualitative data.

This reviewed reported various instruments for data collection. Several studies employed achievement tests that assess students' linguistic performance to collect quantitative data (e.g., Ataeifar et al., 2019; Li and Cummins, 2019). Others were completed through questionnaires (e.g., Chen, 2016; Chen & Lin, 2018). Other studies combined different instruments for a particular design of the study. For example, Alharbi (2019) collected data for a true experimental study through pre-test and post-test in grammar, online commentary exchanges, and follow-up interviews in a study about teaching grammar through videos posted in a blog.

This review included a total of 11 case studies coupled with either a mixed-method approach (N=7), a quantitative approach (N=2), and a qualitative approach (N=2). Another design adopted in this review included the experimental designs (N=12) comprising a quasi-experimental design (N=10) and a true experimental design (N=2). Additionally, two studies employed the action research design combined with the mixed-method approach. The designs of the reviewed studies yield a limitation that is discussed in the limitation section.

## **MALL Tools**

The integration of mobile technology in EFL/ESL instructional practices creates an opportunity for teachers to improve the quality and the frequency of learning interaction. This interaction allows students to train their linguistic and communicative performance as well as to gain a better comprehension of the language they learn. Among various mobile applications that can be integrated into learning activities, instant messaging services have been frequently mentioned as potential media of interaction.

### ***Instant Messaging Application***

Instant messaging applications have been the most frequently used template for MALL in the previous studies. For instance, Chen Hsieh et al. (2017) employed LINE to study 42 students in a flipped classroom setting. Another popular instant messaging tool, WhatsApp, was harnessed by Hazaea and Alzubi (2018) in their study about the roles of this tool to establish learner's autonomy in the EFL reading.

### ***Social Media***

Several empirical studies mention the use of social media as an instructional tool. Yu's study (2018) was concerned with empirical evidence of the value learners place on using Facebook and the conditions within which their participation occurs. Similarly, Bailey et al. (2017) examined the effects of Facebook on the language learning process and further investigated students' patterns of interaction during the process. In another study, Ataeifar et al. (2019) employed Twitter in an attempt to reveal how students perceived the application of MALL.

### ***Other online mobile applications***

Several MALL applications including mobile games and learning platforms were utilized in a number of studies. For instance, Chang et al. (2016) employed a Mobile Instructional Pervasive Game (M-IPG) learning method to increase students' learning

achievements. Grimshaw and Cardoso (2018) adopted Spaceteam ESL to facilitate students' oral communication aiming for better performance on fluency.

## Participants

This review identified a total of 1889 participants in a diverse scheme of studies. They were dominated by undergraduates whose ages ranging from 18 to 24. Additionally, the majority of the studies took place in Asia countries (N= 22) comprising Japan, Taiwan, South Korea, Hongkong, China, Vietnam, Malaysia, Iran, and Saudi Arabia. There were only two studies reported from Canada and one study from Chile. The implication of these findings will be discussed further in the limitation of the study.

This study did not collect data through direct interaction with the participants and thus exposed no threat to any human subjects. Therefore, the institution did not require ethical approval for this type of study.

## Empirical Evidence on the Benefits of MALL

Various studies on MALL have revealed pedagogical benefits in improving students' competence in EFL instruction. The following table highlights the benefits that are elaborated into the following research strands.

**Table 3**

*Empirical evidence on the benefits of MALL*

| Category  | Study  |
|---|--|
| Language performance development                | Chen Hsieh et al. (2017); Fang et al. (2018); Naderi and Akrami (2018); Hazaea and Alzubi (2018); Chang (2020); Ngui et al. (2020); Vaezi et al. (2019); Chang et al. (2016); Alharby (2019) |
| Positive attitudes towards the learning process | Chen (2016); Chen and Lin (2018), Reynolds and Taylor (2020); Alharbi (2019); Grimshaw and Cardoso (2018); Le (2020)   |
| Motivation and metacognitive skills             | Lai and Zeng (2018); Chang (2020); Chang et al. (2016); Reynolds and Taylor (2020)   |
| Improvement of students' retention              | Kurt and Bensen (2017); Naderi and Akrami (2018); Chang (2020); Liu (2016)   |
| Collaborative learning models                   | Wu (2019); Albadry (2017); Chang (2020); Grimshaw and Cardoso (2018)   |
| Extensive learning opportunities                | Kurt and Bensen (2017); Ngui et al (2020); Hazaea & Alzubi, 2018; Chen Hsieh et al. (2017)   |

### *Language performance development*

EFL/ESL studies on MALL predominantly seek to investigate the effectiveness of this technology in developing students' language performance during the learning/teaching process. The majority of the studies reported the pedagogical benefits of MALL in improving students' oral proficiency. For instance, Chen Hsieh et al. (2017)

conducted a study on the mobile application LINE. A total of 42 students were recruited to receive treatment of this mobile application in a flipped classroom setting. The findings suggested that this application managed to improve the effectiveness of the flipped classroom model indicated by the significantly higher result of the speaking tests as well as positive reception from students for the mobile application. In another study, Fang et al. (2018) employed mobile devices serving as a medium of classroom interaction and peer feedback focusing on students' speaking performance improvement. This quasi-experimental study involved 40 EFL Taiwanese students who were equally assigned to either the experimental group undergoing the peer feedback treatment or the control group receiving no peer feedback treatment. The implementation of mobile devices afforded students a feature to monitor their oral production and provide/receive corrective feedback that enhanced their speaking proficiency. Students further mentioned that the improvement was attributed to the fact that they responded to feedback from their peers aside from their self-formulated strategies that suited their learning styles.

Regarding reading skills, Naderi and Akrami (2018) delved into the application of Telegram in teaching reading and the effects on gender differences. The study involved a total of 147 volunteers of which 103 students were assigned to either the experimental or control group. The treatment for the experimental group was given through Telegram, which was utilized to teach twelve reading passages. The study indicated significant effects of Telegram in improving students' reading competence. It also revealed that gender difference did not significantly affect the results of the study. This result aligns with the research findings by Hazaea and Alzubi (2018), which concluded that mobile devices accommodate the necessary supports for students to autonomously develop students' reading skills. This experimental study highlighted the use of WhatsApp or search engines as supporting media to interact and access the learning content. The data were gathered through students' portfolios and interviews.

Aside from speaking and reading skills, another study indicated positive results in writing skills as a result of MALL application. A study about the efficacy of MALL to teach writing was conducted by Chang (2020) through blogs as a platform to alleviate students' writing problems. The participants were 25 low proficient EFL students from a national university in eastern Taiwan. The findings revealed that blogs managed to assist low proficient students to develop their writing skills. Blogs could facilitate an authentic interaction among students allowing students to compare their works and exchange notions of writing which subsequently raised positive perspectives on their writing activities. Similarly, Ngui et al. (2020) examined the adoption of e-Portfolio as an assessment tool of students' writing performance. This case study involved 46 students and harnessed both questionnaires and interviews as the main instruments to collect data. The results showed that e-Portfolio could be a potential tool to develop students' writing performance. This tool could be utilized to accommodate instructors' feedback, learning reflection, as well as peer review which provided necessary input for students to develop their writing skills.

As for listening skills, Vaezi et al. (2019) conducted a study about the flipped classroom model utilizing mobile devices to develop students' listening performance. This study employed an experimental design and recruited 119 Advanced EFL Iranian students consisting of 36 males and 83 females and aged from 19 to 37. These participants were later divided into two experimental groups receiving a flipped classroom model (an Authentic Audio Material Group and a Pedagogical Audio Material Group) and one

Control Group receiving a conventional learner-centered model. The two experimental groups received similar treatment with different audio materials: Authentic audio content from several websites for Authentic Audio Material Group and listening books for a Pedagogical Audio Material Group. The findings indicated that the flipped classroom model utilizing mobile devices managed to prove its effectiveness to develop students' listening performance. Additionally, of all materials, authentic audio materials were considered the most impactful to teach listening.

Furthermore, Chang et al. (2016) examined the use of a mobile instructional pervasive game (M-IPG) learning method to increase students' language learning achievement. The data was gathered through an achievement test to assess students' competence in reading, writing, grammar, and vocabulary that was formulated by two qualified EFL teachers. This study involved 137 students divided into two groups: the experimental group received the M-IPG method, and the control group received the mobile inquiry-based instruction as the treatment. This M-IPG method included an exploration learning model coupled with the task query game during the instruction featuring competition and rewards. The statistical results revealed that the M-IPG method managed to effectively improve students' learning achievement. In another study, Alharby (2019) provided evidence of the strengths of blogs through the video feature to support grammar instruction. This experimental study recruited 60 participants that were later assigned to either the experimental (N=30) or the control (N=30) group. From the analysis, it was revealed that videos significantly improved the positive impact of grammar instruction. The findings of qualitative data implied that students' engagement in the learning process was enhanced due to the use of the videos. Furthermore, students mentioned that the use of videos made learning more enjoyable despite emerging issues such as internet connection and an excess of peer feedback.

### *Positive attitudes towards the learning process*

Several studies examined the effects of MALL with the major focus on students' perceptions. The majority of these studies indicate students' positive behaviors toward the application of this technology. For instance, Chen (2016) asserted that both teachers and students positively perceive MALL for EFL instruction despite a difference in their rationales. Students argued that a positive attitude towards MALL managed to improve their language proficiency. Teachers also asserted that the rate of interaction increased between the teacher and students as a result of a positive attitude towards MALL.

Another study on students' perception of mobile device application in EFL instructional practices was carried out by Chen and Lin (2018). Utilizing task-based language teaching as the pedagogical framework, this study attempted to reveal how students perceived the use of mobile devices as a medium of instruction. The findings showed that students considered the mobile application-based assignment helpful as they were engaged in a distant interaction. This study further suggested that teachers include fun activities to reduce the demotivating affective learning factors and successfully achieve the learning goals. A similar view is shared by Reynolds and Taylor (2020) who investigated how instructors perceived the mobile application Kahoot! as well as how effective it was as an instructional medium to improve students' vocabulary. Using a sample of 78 third-year South Korean university students, the study concluded that there was no significant impact of this medium on students' vocabulary acquisition. However,

the qualitative data revealed that Kahoot! possessed the potential to promote an active learning mode by stimulating students' kinaesthetic, visual-spatial, and musical aptitudes. It was also reported that students showed their interest in the collaborative instructional model that Kahoot! accommodated indicating that the strength of this application lies in its capability to accommodate encouraging, engaging, and enjoyable learning (Reynolds & Taylor, 2020; Wichadee & Pattanapichet, 2018; Zarzycka- Piskorz, 2016).

Alharbi (2019) provided evidence that video-based grammar teaching positively affects students' perception of class activities. It was mentioned in the study that students were more motivated to listen and watch the explanation through videos. Furthermore, students were encouraged to discuss the new grammatical structures with their peers. Using Spaceteam ESL, Grimshaw, and Cardoso (2018) showed evidence that an immersive learning setting can be manifested as students made a good collaboration with their peers. Spaceteam ESL could facilitate an enjoyable space for students to interact with their peers as they play the game through tablets or smartphones. Even after the class, students were still encouraged to communicate about the game itself which left a positive impression on the class. A study by Le (2020) addressed the issue of foreign language enjoyment by employing an application named Puppet Pals. This application serves as an electronic story-telling program which is formatted in digital media intended to ease the difficulties in oral language production. This study recruited 69 First-year Vietnamese students to participate for seven weeks. The analysis of three research instruments, The Foreign Language Enjoyment Scale (FLES), video recordings observation notes, and a semi-structured interview, showed that the majority of students positively responded to the instructional model. Both instructors and students overwhelmingly approve that this medium could positively alter class atmosphere through an innovative model of instruction. Students could be more creative and expressive in producing oral language using Puppet Pals. This application also managed to alleviate students' cognitive load and contribute to the development of students' learning motivation.

### ***Motivation and metacognitive skills***

Teachers are capable of building a learning nuance that triggers students' motivation up to a higher level, but the optimal learning achievement can be obtained if the motivation is derived from students themselves (Deci, Koestner, & Ryan, 1999). Several studies indicate that the use of MALL promotes an improvement not only in students' progress of learning but it also positively affects students' learning motivation. For instance, Lai and Zeng (2018) delved into students' experiences to harness their mobile devices as supporting learning instruments outside the classroom. The data were collected through a survey of 256 EFL students in Hongkong. To support the findings through more in-depth data, interviews were conducted with 18 students who were selected from the total participants. The study revealed that students employed mobile devices for their learning mostly as an instrument to support their learning styles. This phenomenon subsequently led to students' positive perceptions of the learning process. Furthermore, the findings suggested that students' initiatives to learn a foreign language using mobile devices should be extensively reinforced to promote their respective more personalized learning models. Instructors should also consider developing instructional models outside the classroom based on the interaction patterns between students, students'

habit of the use of mobile devices, students' view of MALL, and the organization of class assignments.

MALL application can serve as a medium that stimulates students' initiatives to interact and thus engage in the learning process. Chang (2020) reported that blogging could become an engaging activity for students. Students can actively participate in the writing task through this medium with less overwhelming feelings as they might have in a conventional writing task. In other words, this medium could decrease the cognitive load and thus improve students' motivation and independence in EFL learning. In another study, Chang et al. (2016), who utilizing a mobile instructional pervasive game (M-IPG), found that the combined elements of gamification and mobile technology could boost students' confidence to use English aside from their effectiveness in increasing students' learning achievements. Reynolds and Taylor (2020) also identified an increase in students' motivation as MALL was implemented through the mobile application Kahoot! The majority of students mentioned a transformation in their class indicating students' sense of fun emanating from the class activities.

### ***Improvement of students' retention***

Several studies indicate the strength of mobile devices to improve students' retention. For instance, Kurt and Bensen (2017) mentioned in their study that the mobile application managed to develop students' vocabulary by visually training them to retain the words in their long-term memory. Furthermore, incorporating the challenging and competitive elements of mobile game software allowed students to better recall the learning materials (Chang et al., 2016). Similarly, Naderi and Akrami (2018) stated that mobile technology proved to be more effective than the conventional method of lecturing for improving students' vocabulary retention. This finding is supported by Chang (2020) in a study about blogs to teach writing. Blogs could facilitate an interactive instructional model enabling students to check their peers' writing, develop new writing ideas, respond to other's writing products, and improve writing performance through the instructor's feedback. These benefits helped students consciously and subconsciously gain new vocabulary and retain it in their memory.

Liu (2016) proposed a concept mapping strategy by harnessing mobile phones to improve students' vocabulary. This quasi-experimental study involved 100 students equally assigned to either the experimental or control group. Both groups were taught using IM with two different treatments: concept-mapping strategy for the experimental group and text-only strategy for the control group. The treatment for the experimental group adopted the students' concept maps to organize the vocabulary students acquired during the lesson while the control group received vocabulary with no certain arrangement. The findings revealed that the experimental group performed better in vocabulary retention compared to the control group. Therefore, it was concluded that the concept-mapping model could serve as an effective medium to improve student retention, especially for vocabulary content.

### ***Collaborative learning models***

Emphasizing the essence of communicative competence, the collaborative learning model has been strongly promoted to improve the rate of students' interaction

and language use. Wu (2019) suggested collaborative learning resulted in a reduction of students' anxiety levels compared to individual learning. MALL proposes its potential to promote a collaborative learning model as educational merit in EFL/ESL instructional practices. For instance, Albadry (2017) conducted an empirical study that examined the strategies used by students to learn English harnessing iPad or tablet devices. Involving 21 students of a university in Saudi Arabia in a twelve-week study, it was revealed that using iPad enabled students to perform well in a collaborative setting. Students gained more opportunities to converse in the target language with the necessary guidance from the teacher. The iPad serves as convenient learning support through its portability and features that optimize the learning interaction between students as well as with the teacher.

In a similar study, Chang (2020) investigated the effectiveness of blogs as a platform to alleviate students' writing problems. This study suggested that blogs managed to assist low proficient students to develop their writing skills. Blogs can facilitate an authentic interaction among students allowing students to compare their works and exchange notions of writing which subsequently raised a positive perspective on their writing activities. Additionally, a study by Grimshaw and Cardoso (2018) revealed the impact of mobile devices for improving students' fluency. This study was under the assumption that ESL learning practices put less emphasis on students' fluency and language automatization. Therefore, a mobile game application namely Spaceteam ESL provides pre-constructed learning activities to address this issue by encouraging students to produce oral language and thus practice their fluency. The study itself recruited 20 college students in Canada who were equally assigned to either the experimental group or the control group. The treatment for the experimental group was assigning students to have a 15-minute opening activity through Spaceteam ESL, while the control group received non-game treatment. The analysis of the quantitative data revealed that the experimental group outperformed the control group in judges' ratings for oral fluency. The qualitative data analysis indicated students' sense of comfort towards the learning process. It was reported that they were less pressured by non-intimidating feedback from their peers for their language production.

### *Extensive learning opportunities*

Another strong point of employing MALL for EFL instructional practice is extensive learning opportunities. Kurt and Bensen (2017) examined the effectiveness of Vine Vocabulary Videos (VTV) to improve students' vocabulary. Incorporating a mixed-method design, the findings revealed that the application of Vine vocabulary videos managed to motivate students and thus improve their vocabulary. This study further suggested that mobile devices could support collaborative instructional models by providing extensive opportunities for students to practice their language beyond the classroom setting. Similarly, Ngui et al. (2020) highlighted the benefit of more extensive classroom experience through accessibility and portability of mobile devices to enable students' autonomous learning. Instructors can harness the flexibility of messaging services and search engine to increase students' reading time and thus develop their interest in reading. The study also emphasized another benefit for students who missed any parts of the classroom discussion due to absence or tardiness to stay on track with the instruction. (Hazaea & Alzubi, 2018). Furthermore, in another study, Chen Hsieh et al. (2017) provide evidence for the affordance of LINE to accommodate an engaging and

encouraging language learning setting that triggers a student's initiative to use English. This application allowed students to interact and work with their peers or communicate with the instructor to get additional guidance after classroom hours.

### MALL Application Issues

The implementation of MALL has led to an affordance of pedagogical benefits in the improvement of EFL language skills and a positive learning attitude. However, the reviewed studies also mentioned several issues that potentially hindered its effectiveness. These issues address learning anxiety, insufficient technology literacy, and technical limitations.

Table 4  
*MALL Application Issues*

| Category                         | Study   |
|----------------------------------|---|
| Learning anxiety                 | Kurt and Bensen (2017); Bailey (2019); Bailey et al. (2017)   |
| Insufficient technology literacy | Chen and Lin (2018); Reynolds and Taylor (2020); Cárdenas-Moncada et al. (2020)                           |
| Technical limitations            | Ataeifar et al. (2019); Tafazoli et al. (2018); Metruk (2020); Bailey et al. (2017); Yu (2018); Le (2020) |

#### *Learning anxiety*

Unlike the conventional instructional model, the implementation of MALL requires students to intensively utilize their mobile devices. Students are not only required to access the materials and engage in an online discussion, but they are also required to complete assignments or projects through mobile devices under any circumstances. As a consequence, students might get burdened with this kind of assignment. For example, in a study conducted by Kurt and Bensen (2017), students mentioned that they felt frustrated to complete the assignment using the mobile application due to the time-consuming and assignment's complexity.

Another study by Bailey et al. (2017) noticed that employing social media Facebook for collaborative tasks could be distressful for students. In their study, students were asked to respond to postings made by the instructor. It was reported that students who had a close relationship with others managed to easily complete the task compared to those who did not. This class relationship issue was also discussed in Bailey (2019) reporting that low competent students are likely to experience learning anxiety. Using mobile devices in a collaborative learning setting can make students confused due to their lack of understanding about the learning content and the feeling of embarrassment towards others should they fail to accomplish the task.

#### *Insufficient technology literacy*

Students possess a wide range of proficiency levels in technology depending on their experience and their background. This lack of technology literacy could potentially

pose a threat to the implementation of MALL. For instance, Chen and Lin (2018) found that some students required special training in MALL application as they reported having encountered difficulties in editing videos that were a part of their assignment. Reynolds and Taylor (2020) also mentioned in their study that several instructors doubted the effectiveness of Kahoot! in their instruction and leaned towards the conventional model. It is indicated that their views towards learning coupled with the lack of technological competence might prevent them from exploring the potential of mobile devices for language learning. However, they acknowledged the positive effects of this application to provide enjoyable class experiences and to serve as a complementary tool aside from textbooks. Additionally, insufficient technology literacy might cause negative perceptions of the overall learning process. Cárdenas-Moncada et al. (2020) in their study about Kahoot! inferred that unfamiliarity of the adopted applications can cause an ineffective use of mobile language learning in class.

### ***Technical limitations***

Various technical limitations that can potentially pose an insurmountable obstacle to the implementation of MALL have been identified in several studies. As the majority of mobile learning relied on the internet connection, slow internet connection became an irritating issue as it gave students difficulties to complete their online assignments (Ataeifar et al., 2019). Additionally, mobile devices needed to be sufficiently charged so that students could maintain their participation in online interaction. Other technical drawbacks that teachers should pay attention to are the limit on message length, restrictions on audio-visual communication, and the need for mobile devices with certain specifications that some students cannot afford (Tafazoli et al., 2018; Metruk, 2020). Bailey et al. (2017) stated that current MALL technology such as social media presented a challenge for students to have a high-level writing experience. As students were assigned to respond to the posting on Facebook, it was reported that they were unable to thoroughly expressed their ideas and thoughts through their written responses.

Completing online tasks such as watching videos, reading learning content, or completing an assignment can be displeasing for students due to the limitation on mobile devices. A study by Yu (2018) noted that students' experienced cognitive overload as they were assigned to read their reading texts on their small smartphone screens. In another study, Le (2020) mentioned several issues in the implementation of Puppet Pals due to its sole availability on android devices and its limited features on its free version. Additionally, instructors needed to allocate a classroom period to prepare students with the application as students were still unfamiliar with it.

## **Pedagogical Implications**

Several studies have revealed the pedagogical advantages offered by the implementation of MALL in EFL/ESL instructional practices. However, various conditions should be met to gain optimal results. This review offered several pedagogical implications. Firstly, well-prepared activities are necessary to ensure that MALL can be optimally utilized in class and serve as a helpful support to assist EFL learners in completing them. MALL application must not be seen as additional work that increases

students' workload and thus decreases their learning motivation. MALL application may also lead to a passive role of teachers which prevents students from being involved in meaningful and authentic learning interactions (Hayati et al., 2013; Lai & Zheng, 2018; Ataeifar et al., 2019). Teachers are encouraged to design interaction-based activities in which they can actively monitor, engage, and provide additional guidance in online interactions. In other words, relying solely on the mobile application cannot guarantee the success of learning unless teachers can skillfully utilize this technology and adopt it in an engaging instructional model (Yu, 2018).

Secondly, teachers and students need to possess adequate proficiency in technology (Gomez, 2016; Ataeifar et al., 2019). Teachers need to be familiar with the technology they are using in the class and make an evaluation of whether this technology can be efficiently adopted and suits the needs of the class. Furthermore, it is also essential to determine if this technology can be practically utilized by all students outside the class. Teachers should identify what kind of mobile applications that students are familiar with and possibly use similar applications.

Thirdly, the selection of suitable software applications or learning platforms should be carefully done based on a number of variables such as the needs of students, the theme of the learning content, and practicality. Chen and Lin (2018) indicated that teachers and teaching practitioners are being motivated to develop their class instruction by incorporating mobile technology to satisfy students' interests and needs. However, teachers also need to be particularly aware of the threats causing students to lose their focus as they use their devices to join online chatting, play games, or merely browse the web (Viberg & Grönlund, 2013; Gikas & Grant, 2013; Metruk, 2020). Furthermore, selecting an application that offers entertaining or comedic content can be a plus point to increase learning pleasure (Alharbi, 2019)

Fourthly, regular evaluation for the MALL application can be a good reflection of the development of instructional practices. Teachers can assign students to fill out a questionnaire to reveal their impressions for MALL implementation. Another possible way is to assign students to write a short reflection describing their experience in using mobile devices for class activities. This feedback from students can be an insightful reference to solve emerging issues and formulate a better preparation for MALL application in the future.

Fifthly, MALL encourages students to bring what they learn in class to the outside world. Teachers should consider this opportunity and make attempts to incorporate any possible strategies that allow students to utilize their language proficiency through mobile technologies based on their cognitive style or preference (Ataeifar et al., 2019; Shahsavari & Tan, 2011). It is suggested that researchers conduct experiments about integrating mobile technology with various learning strategies that prove to positively affect learning such as portfolios and augmented reality in future studies for diverse levels of instruction.

Finally, instructors' supports in terms of learning intervention and learning motivation are still deemed essential in several learning schemes. For instance, Chang (2020) and Wu (2019) agreed that complimentary feedback for students' assignments positively affected students' motivation. Instructors need to continuously encourage to reduce students' cognitive load and keep them engaged in the learning process. Essentially, instructors also need to carefully organize MALL applications and monitor students' interaction during application as well as make necessary interventions depending on the situation (Li & Cummins, 2019). Additionally, instructors should

consider allotting time to have a digital meeting to monitor students' progress which subsequently helps them organize their learning. Wu (2019) found that students cannot complete their assignments in a disruptive learning setting suggesting instructors help them organize their learning through scheduled meetings outside their classroom.

### **Research implications**

Future research can address self-directed mobile language learning beyond the classroom in different sociocultural contexts. As the majority of studies dealing with MALL in higher education were conducted in Asian nations especially East Asian nations such as Taiwan, South Korea, and China, examining how the practice of MALL in other parts of the world that have diverse socio-cultural backgrounds such as Africa, Europe or the United States for ESL/EFL contexts can be essential references for future studies in this area.

Another topic that is worth investigating is the comparison of three commonly used mobile devices; smartphones, tablets, and laptops. As mentioned in Yu (2018), students complained about the small screen on smartphones as they use them for reading content or watching videos. However, this device was adopted in most studies compared to the other two. In terms of language skills, listening skills are still not broadly explored through MALL. Of all studies, only one study was found to be dealing with this skill. This review covers the elements of grammar and semantics. It shows opportunities for future studies to examine the effects of MALL on other linguistic elements such as phonology and pragmatics.

### **Theoretical implications**

The current study revealed theoretical frameworks on which the previous studies were grounded. Collaborative learning, which is the essence of social-constructivism, is explicitly and implicitly mentioned in most studies as the foundation. Several studies also mentioned the cognitive load theory, which can emerge due to the limitation of the current features of mobile devices or the lack of experience from both instructors and students to employ the devices. Further studies grounded on the cognitive load theory to compare the impact of MALL for students from different economic circumstances, different technological access, or diverse socio-cultural backgrounds will provide insights into how this model of instruction can be impactful or even ineffective in different learning contexts. Hence, innovation or strategies can emerge from these studies.

### **Conclusions**

The use of mobile devices supports instructional settings emphasizing students' independent learning and extensive learning models. Students are encouraged to gain knowledge and learning experience with high portability that offers a high degree of interactivity. This study presents a review of previous studies focusing on the use of mobile assisted-language learning within the scope of EFL/ESL settings in higher

education. It included publications issued between 2016-2020 displaying the use of the latest mobile instructional tools to support teaching practices. From the review results, it was found that MALL studies in higher education were carried out based on the constructs of the Zone of Proximal Development (ZPD), Technology Acceptance Model (TAM), The Community of Inquiry (CoI), Cognitive load theory, TPACK, and SMAR.

The findings show that studies on MALL for ESL/EFL instructional settings in higher education have been conducted using several models. The majority of studies applied experimental designs comprising a quasi-experimental design and a true experimental design to investigate the effectiveness of mobile learning technology, while others employed a case study design (N=11) exploring students' perceptions of this technology. These studies employed different tools to facilitate learning such as instant messaging applications, social media, and language learning-specific mobile applications.

This review reveals both pedagogical affordances as well as the practical challenges of the previous studies. MALL is identified to excel in developing varied language proficiency. Several studies targeted developing students' learning motivation. Students' development of vocabulary retention has also been a special concern. This technology also offers a collaborative learning setting that is practically extended to give students more opportunities to interact in the target language.

The application of MALL for EFL/ESL settings in higher education is not without hindrances. It was reported that students experienced learning anxiety as they were completing the mobile-based assignments. Studies also indicated students' lack of technology literacy resulting in less optimal use of the required features on mobile devices. The limitation of the technology also presented a real challenge for teachers to incorporate this technology in their class.

Based on the collected studies, this review formulates pedagogical implications for the effective implementation of MALL. First, providing preparatory activities is necessary. Teachers need to ensure that the technology can be optimally utilized in class and serve as a helpful support to assist EFL learners in completing them. Second, teachers need to possess good proficiency in technology. Third, selecting suitable software applications or learning platforms should be carefully done based on targeted variables such as the needs of students, the theme of learning content, and practicality.

To sum up, the recent studies of MALL utilize mobile technology as a support for improving the quality of EFL/ESL learning. Various studies indicated the pedagogical benefits of mobile technology in developing language skills along with potential threats. However, considering the pedagogical benefits, positive perceptions, and high acceptance from both teachers and students, incorporating mobile technology in class is worth considering. The potential of mobile technology offers a possibility of new instructional models allowing students to improve their performance and increase learning independence through self-directed learning. Future research can be directed to improve the quality of MALL applications by formulating strategies to overcome the possible issues and enhance its practicality.

## **Limitations**

This review serves as an essential reference for future studies in terms of MALL integration in EFL/ESL instruction covering diverse research models and areas. However,

there are several limitations indicating research gaps to address for future research. First, the number of journals used is restricted by the journal selections. The increasing number of publications in MALL poses a major challenge to ensuring an extensive and detailed search. For this reason, well-defined criteria were adopted for the selection of journal articles. Considering the range of quality, the study opted to refer only to articles in journals listed in SSCI due to their higher impact in the field. Most of these journals are open access with a good-qualified standard for the field of MALL and EFL/ESL instructional practices. However, there are numerous journals with restricted access that can offer more rigid studies suitable for the criteria of this study such as TESOL Quarterly. There are also many studies with good quality and yet excluded from the selection due to the pre-determined criteria such as SCOPUS-indexed and the year of publication. This study also limited the coverage solely on the higher education level.

Furthermore, it can be inferred that the result might suffer from the issues of generalization due to the design of the study. The studies included in this paper were dominantly case studies originating from Asia countries (Japan, Korea, Taiwan, Malaysia, Iran, Saudi Arabia, and Vietnam). The other two studies were carried out in Canada and another study was reported from Chile. Hence, the results might not apply to other nations in other continents that possess different socio-cultural backgrounds, technological access, or students' characteristics. Furthermore, in terms of research designs, most of the experiments of the studies incorporate quasi-experimental design with no total control over the participants implying that there might be other variables influencing the findings.

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