MOBILE-ASSISTED LANGUAGE LEARNING (MALL) IN ESL VOCABULARY LEARNING: A SYSTEMATIC LITERATURE REVIEW

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ABSTRACT

The incorporation of modern technology in the field of education has become the need of the hour so that the process of education can fulfil recent trends. This literature review focused on the research about the usage of MALL for teaching and learning English vocabulary to ESL learners. The study reviews various aspects of MALL integration, perceptions of students, preferred MALL-based techniques, the role of MALL in improving lexical competence and the use of MALL for learning different language skills. The factors affecting the integration of MALL and the role of learner and teacher in the implementation of MALL were also discussed in the literature review. Moreover, the review also discussed the benefits and drawbacks of using MALL in learning language and discussed the frameworks established by researchers for the better integration of MALL in the language learning process concerning different levels of students. This review further discussed the gaps in the studies and established a theoretical framework for further endeavours to study the use of MALL for English language learners specifically relevant to Pakistan.

Keywords: MALL, ICT, EFL, ESL, SLA, FLA, learners' perceptions and preferences.

INTRODUCTION

In the present state of society, ICT plays a great part in education for the improved teaching-learning process (TLP) and for its assessment. eBooks and interactive whiteboards are very prominent examples of the integration of ICT in instruction, as the world is shifting towards a paper-free environment, and the usage of eBooks is a very important step in this regard (Woodward & Atkins, 2014). M-learning is the use of mobile devices for knowledge and skill acquisition, regardless of location or time, which ultimately results in a change in an individual's behaviour (Geddes, 2004). Moreover, current advancements in the field of MALL have focused on the measurement and support mechanism for self-regulated learning (SRL) by the usage of mobile phones (Winne, 2017). The concept of education in Pakistan is mostly dependent on conventional methods that lack the integration of modern technology in the current educational system. Furthermore, to the extent that English language teaching is concerned, outdated methods are still being used in Pakistan, and the practise of technology is restricted only to computers and laptops along with multimedia for presentations at the university level. The use of traditional methodologies with modern technology tools is not giving a proper and effective outcome because there is still a serious necessity to contemplate the proper and effective integration of technology in English language education in Pakistan.

This review aimed to identify well-documented resources from published literature that discussed the usage of MALL from different perspectives. The current review study utilised various research articles to discuss the following research questions specifically related to the Pakistani higher education system.

1. What is the perceived importance of using mobile-assisted language learning (MALL) for English vocabulary learning among undergraduate ESL learners?
2. Which MALL-based techniques are effective in English vocabulary learning among undergraduate ESL learners?
3. In what ways does the use of MALL contribute to improving the lexical competence of undergraduate ESL learners?

A comprehensive literature review was conducted by the researcher to analyse the theories and methodologies used for investigating the integration of MALL in ESL learning and teaching. The reason for reviewing past literature was to devise a theoretical framework, research paradigm and result gap that would be finalized for the current study. Most of the research works under review used three research methodologies, which included quantitative, qualitative and mixed methodologies for collecting data from the participants of the search. The review of the study also suggested that different conceptual and theoretical frameworks were also used in studies by the researchers, and the respondents in all the studies were mostly teachers and learners who were actively engaged in the teaching and learning process. The respondents belonged to different levels of educational establishments, such as schools, colleges and universities. Moreover, the past literature has also discussed various areas of teaching and learning, including curriculum, teacher training, student awareness and subject-related studies. All these studies covered major areas regarding the application of MALL in English language teaching, yet there were certain gaps in these studies. On the other hand, these studies concluded by suggesting various recommendations for the better application of MALL in English language teaching.

METHODOLOGY FOR THE LITERATURE REVIEW

The purpose of the literature varies according to the requirements of the research and researchers, as it can fulfil different purposes from identifying the literature gap to developing a theoretical framework for the study (Pickering & Byrne, 2014), and the researcher also tried to utilize the literature review for these purposes. In addition, through a literature review, the reviewer tried to compare the findings of research to understand the methodologies being employed in these studies so that the researcher can devise a methodology for the current research to make the research reliable and valid. Moreover, an effective literature review is the basis for advanced research and knowledge, and it could also be very beneficial in developing the theoretical study of the research area that was thoroughly employed by the researcher during this systematic review.

Moreover, the structured approach suggested was by the researcher for reviewing the past literature so that the texts related to MALL and vocabulary learning could be searched, selected, scanned, read and analysed for the study. Additionally, the studies for the literature review were searched using the following search sites:

https://www.tandfonline.com/
https://uk.sagepub.com/en-gb/eur/home
https://www.sciencedirect.com/
https://www.frontiersin.org/
https://www.mendeley.com/search/
https://scholar.google.com/
https://consensus.app/

The researcher used keywords, i.e., Mobile-assisted language learning, MALL, ELT, EFL, ESL, vocabulary learning, Pakistan, Asia, Role of technology, teacher and learner in ELT and English language learning. Furthermore, the research was strictly restricted to relevant keywords, data available in English language only were selected for the current research, and no translated data were used for the study. Similarly, the data used were published articles from different journals along with relevant books so that the foundation of the literature review could be concrete. A total of 45 published articles were used for the review. First, the

articles were selected after the scanning of the abstract and introduction of each work in review, and then a comprehensive study of the articles and books facilitated the researcher categorize the works that helped in addressing the research objectives of the research. In addition, all the articles related to the study were selected from the period of 2015 to 2022.

MAPPING OF THE WORKS IN REVIEW AND AREAS OF DISCUSSION

All 52 papers were mapped into 6 major categories and then 13 subcategories for review and discussion, after which a research gap was identified for the study. In this literature review, 4 research papers discussed the impact of technology on language learning and the perceptions of learners and teachers regarding the use of technology for learning the language, whereas 6 research papers discussed the integration of mobile-assisted language learning (MALL) for the learning of language, of which 10 research papers discussed the usage of MALL specifically for learning vocabulary, and these studies included experimental studies and survey studies. In addition, 15 studies discussed the usage of MALL, based on experimental and survey studies, for different language skills, including listening, reading, speaking and writing, so that the usage of MALL could be understood for these language skills. Among these 15 studies, 5 emphasized the advantages and benefits of using modern technology in teaching and learning, and how these technologies revolutionized the process of education was also elaborated through 4 research articles.

Furthermore, 4 research papers spotted light on the acquisition of foreign language by using technology, especially MALL, and 4 papers emphasized the acquisition of second language by using modern technology. Moreover, these research articles discussed the comprehensive definition of foreign language acquisition and second language acquisition and how modern technology influenced both SLA and FLA. Similarly, a total of 9 articles discussed the role of technology, learners and teachers in English language learning, among which 3 articles were related to technology and 3 were related to learners, whereas 3 articles elaborated on the role of teachers in English language learning by using modern technology. Furthermore, the literature review also discussed the integration of modern technologies in the curriculum and highlighted different suggestions for the future given by researchers so that MALL could be positively adopted for learning language.
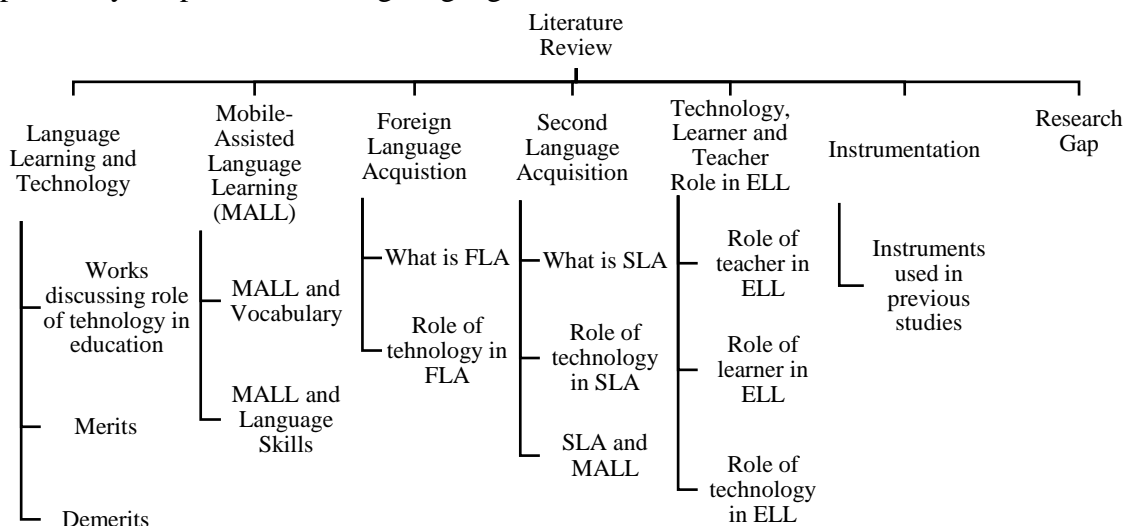
AREAS OF DISCIPLINE

The works in the review covered eight major disciplines that linked MALL with English language learning and teaching. Moreover, in this review, 5 research papers discussed EFL teaching and learning, whereas 8 studies discussed ESL teaching and learning by using modern technology. Ten papers explained the research about the use of social media for the enhancement of vocabulary learning, 3 papers discussed the role of virtual reality (VR) for language learning, and 4 studies explained the capability of games for the enhancement of

language learning. Moreover, from the same viewpoint, 2 research articles discussed the use of augmented reality (AR) for learning language, and 17 research articles were about the use of mobile-assisted language learning (MALL) for learning the English language among different levels of students. Finally, the review covered 3 papers discussing the importance of ICT literacy among learners and instructors.

RESEARCH METHODOLOGIES AND DESIGNS

The study discussed various research methodologies and designs employed by researchers in all papers that were included in the literature review. In the review, 13 research papers used experimental design, and 13 research papers used quantitative methods. Moreover, 3 studies utilized qualitative research methodology, along with 6 studies that employed mixed methods for the collection of data. In addition, 3 studies employed meta-analysis, 4 studies used content analysis, 7 studies utilized quasi-experimental research design, and 3 were review studies.

Furthermore, different data collection tools were used by the researchers in different studies, as 17 studies used pretest and posttest data to collect data from the participants, whereas 9 studies were dependent on interviews for the collection of data. Similarly, 8 studies utilized different types of standardized tests to measure the competence of students in English, whereas 18 studies exploited questionnaires to gather data from the participants so that a better understanding related to the technology could be obtained from both instructors and learners of English.

THE PARTICIPANTS/POPULATION OF THE STUDIES

The participants and population of all research papers belonged to various levels of different educational institutes and also different cultures. Moreover, the mainstream of the respondents was ESL and EFL learners and instructors ranging from college to university level. The researchers conducted studies by recruiting different participants, as some researchers conducted the research only on teachers, whereas some conducted research related to students, while some studies involved both teachers and students so that a comprehensive view regarding the use of technology in English language learning and teaching could be obtained. Moreover, it was also observed that very few researchers involved policymakers and curriculum developers in their research, whereas all the researchers gave significant importance to ethical issues while conducting their research.

LANGUAGE LEARNING AND TECHNOLOGY

Language learning and the usage of technology evolved over the years and were recognized by different names in different eras, as the name plays a significant role not only in the description of a concept but also in the interpretation of the concept (Healey, 2016). Furthermore, it was pointed out that the initial name related to the usage of technology for language learning was computer-aided instruction (CAI), which over the years was also mentioned as computer-assisted language instruction (CALI), which was also called CALL and was suggested by (Davies & Higgins, 1982). Over the years, different acronyms have been used for the usage of technology in language learning, including computer-enhanced language learning (CELL), computer applications in second language acquisition (CASLA), computer-assisted writing (CAW), and technology-assisted or enhanced language learning (TALL/TELL). Other terms, such as the computer-assisted Language Instruction Consortium (CALICO), were also used, and some practitioners also used ICALL for "intelligent CALL", but over the years, the term CALL remained the most commonly used term, which evolved into MALL with the advent of mobile devices because of the usage of mobile devices, which replaced computers over the years.

Moreover, learners presented a confident attitude toward the usage of ICT and considered it beneficial in the procedure of learning a language, completing tasks, and searching for materials related to the study (K.C., 2019). ICT was adopted positively by students in their learning because of the availability of real-life tasks. The significance of the usage of ICT in

education was discussed, and how it was professed by the learners in their education along with the use of diverse search engines by the students for the learning of the English language was discussed. In this narrative study, the researcher used open-ended interview questions along with observations and used narrative journals to determine the status of ICT in learning the English language. All English learning students of Tribhuvan University were part of the research so that their insight about using ICT in learning the English language could be inquired by the researcher. The outcomes of the study exhibited promising attitudes of learners towards the usage of ICT for learning the English language. Moreover, ICT was also studied concerning its usage, perception, purpose, and expectations among EFL learners. Students deemed that ICTs were an imperative resource for English language learning and that they provided additional support and opportunities for practice and interaction (Tri & Nguyen, 2014).

MOBILE-ASSISTED LANGUAGE LEARNING (MALL)

Mobile learning gained the attention of language learners and instructors after the advent of mobile devices, but before this literature did not value the importance of mobile learning concerning portable laptops and did not differ from conventional CALL irrespective of their portability (Stockwell, 2016). Moreover, due to this, the learning matter seemed to be shed down from the desktop precursors, and it not only had an influence on the available tools but also impacted the way they were professed (Squire, 2009). Furthermore, Shortt et al. (2021) summarized diverse methods, scenarios, frameworks, and samples to evaluate the design of the Duolingo application and its influence on learning outcomes by conducting a systematic review. Among 357 articles, 35 were selected for research because they fulfilled the needed criteria related to the choice of language, theoretical framework, sampling, data collection, design, and analysis. It was observed that the mainstream research was fixated on design and was quantitative by using nonprobability methods of sampling.

In addition, MALL had the potential to involve students of the university in informal language learning, which could be steered out of class, and learners also exhibited optimistic opinions about the usage of MALL in the study (García Botero et al., 2019). The study showed that students also favoured the usage of MALL because of the expediency it provided. The study aimed to investigate the out-of-class involvement of learners in informal learning by using Duolingo. The study further investigated the usage of MALL with the help of software tracking so that the usage and views of learners regarding MALL could be compared along with the investigation of self-direction among students by applying (Garrison, 1997) dimensions of self-regulated learning. The study further elaborated that even after being claimed by students that they would endorse and use MALL in informal language learning, self-directed learning could not be merely established by authorizing learners to study autonomously (Benson, 2007; Stockwell, 2008). Additional research has shown that MALL could be proven to be very beneficial and self-regulated for out-of-class contexts, but self-regulatory training and scaffolding could be proven to be very operative in this regard for voluntarily adopting out-of-class MALL contexts (García Botero et al., 2021). The researcher highlighted that the learners need thoroughness when using technology-enhanced learning environments alone, and as far as research was concerned, self-regulation and framework were two concepts that were under researched in relation to mobile learning.

MALL AND VOCABULARY

Research using mobile devices, MP3 players, and PDAs started over the years to see their scope as tools for the learning of language, as the use of MP3 players for learning language by the use of podcasts was discussed along with software such as iTunes and devices such as iPods so that the use of audio devices can be seen for language and vocabulary learning (Rosell-Aguilar, 2007). Moreover, studies were also conducted to see the effectiveness of diverse social media platforms, such as Facebook, Twitter, and Instagram, in improving the English language skills of learners by utilizing these platforms. The usage of Facebook has

positively affected the vocabulary of students, and students showed significant improvements in calendaring knowledge because of their exposure to Facebook (Sim & Pop, 2014). Similarly, mobile devices had a restrained outcome on both productive and receptive vocabulary learning, as adult language learners, instead of young learners, improved by using mobile devices for vocabulary learning (Mahdi, 2018). The researcher highlighted that mobile devices had gained significant importance in the field of ICT over the years and had provided unprecedented rewards in the field of language learning.

Furthermore, students who learned vocabulary through CALL showed significant improvement in their vocabulary knowledge compared with those who did not use CALL to learn vocabulary (Shokrpour et al., 2019). The study was intended to determine the relationship between CALL instruction and vocabulary learning in EFL Iranian learners. Moreover, another study was conducted to see the usage of mobile applications and concluded that the learners found mobile applications very effective and motivating for enhancing their discipline-specific knowledge of vocabulary and considered the use of mobile applications very useful and intriguing (Kohnke & Ting, 2021). It was found that the students were very motivated and felt that the usage of mobile applications was very effective in the construction and escalation of their knowledge of vocabulary during their academic careers. Similarly, a study was conducted to advance a framework for mobile language learning that showed that flexibility in mobile learning was a very attractive feature for students, and this had to be taken into account so that the individual needs of students of different levels could be countered (Zhai, 2021).

In addition, mobile devices have been extensively used for second language vocabulary learning in formal and informal situations to improve and reinforce second language word memorization (Lin & Lin, 2019). The study concluded that mobile technologies facilitated the learning of second language vocabulary and were considered likely pedagogical tools for learning language, as these technologies created authentic, socially interactive, and adapted learning settings that were also context-sensitive for learning language (Jeng et al., 2010). Furthermore, the research elaborated that the vocabulary learning results of EFL learners were significantly enhanced by using mixed-modality vocabulary learning through the implementation of MALL, and variables such as preceding knowledge and partialities, which were independent variables of the research, also exhibited a noteworthy influence on the learning behaviour and attainments of learners (Ou-Yang & Wu, 2017). Similarly, collaboration and active participation of peers in problem solving was one of the major accomplishments of using MALL in vocabulary learning (Al-Ahdal & Alharbi, 2021).

MALL AND LANGUAGE SKILLS

It was observed that the usage of mobile devices for reading courses was also observed so that the courses limited to language laboratories could be effortlessly and amenably employed in general pedagogy by using the CALL system on PDAs (Chang & Hsu, 2011). Moreover, design-based research was conducted to boost ESL learners' aural skills by using mobile phones (Palalas, 2011). The study aimed to establish a set of principles that could fulfil the objectives of listening skills by effectively using MALL. Similarly, studies specifically designed to develop precise language skill were conducted by the researchers with the main emphasis on listening (Chen & Chang, 2011) and to a somewhat slighter degree on reading skill (Lan et al., 2009). Furthermore, a mixed-method study was designed to examine the role and impact of lexicographic tools, which were available online, on second-language writing (Gánem-Gutiérrez & Gilmore, 2021).

Furthermore, developing oral skills by using the online medium of instruction was also studied (Herrera Díaz & González Miy, 2017), and the framework suggested the usage of online English courses for developing oral skills by the community of inquiry. Students who used websites that had automated speech recognition technology (ASR) showed noteworthy improvement in their speaking skills along with vocabulary (Bashori et al., 2022). The

researcher found that the vocabulary skills of students, along with their pronunciation, improved significantly by using websites that had built-in ASR. Moreover, proficiency in English writing and narrative capability of the first language pointedly foreseen the eminence of language usage and completion of the task (Kang & Kim, 2021). Similarly, feedback generated by artificial intelligence showed a significant decline in public speaking anxiety, although the role of the teacher as a facilitator was considered irreplaceable (Chen, 2022). There was a significant reduction in the anxiety levels of all three groups of the study, but no statistical meaning was resolved among these groups (Dai & Wu, 2021; Loewen & Erlam, 2006; Rassaei, 2017).

However, mobile-assisted feedback was positively perceived by students, yet some restrictions, such as small screen size and a limited number of rubrics, were also acknowledged by the students (Wu & Miller, 2020). The impulsive and anonymous nature of peer feedback was considered a defining feature of the application among the users (Xu & Carless, 2017). Similarly, the reading comprehension of learners was better on paper-based mediums than on mobile phones, and reassuringly, they preferred hardcopies for an improved experience of reading on the other hand, positively perceived mobile-assisted EFL reading and exhibited an inclination to resume reading from mobile devices to improve their foreign language learning (Yu et al., 2022).

FOREIGN LANGUAGE ACQUISITION

Foreign language acquisition was defined as the language that was learned in a setting in which it was not spoken by the resident community (De Bot et al., 2005). Furthermore, the terms acquisition and learning were also distinguished (Krahnke et al., 1985), and the acquisition was elaborated as the outcome of a subconscious process that was similar to the phenomenon with which children acquired their first language, but learning, on the other hand, was the outcome of the formal teaching process, which was the creation of the conscious process. Moreover, language learning through digital games showed promising effects on the language development of learners along with the enrichment of engagement, thinking, and collaboration skills, which also instigated the reduction in the fright of failure (Raffone, 2022). Similarly, familiarization strategies proved meaningfully vital in refining the learning performance of EFL learners in unfamiliar settings by using mobile phones (Shadiev et al., 2022). The study concluded that strategies of familiarization made students perform better compared to the learners of the control group who did not practise these strategies (Qiu & Lo, 2017),, and the writing of the experimental group improved meaningfully compared to the participants of the control group.

SECOND LANGUAGE ACQUISITION

Second language acquisition was typically defined as language acquisition that took place in a condition in which the language to be cultured was also the language to be spoken in the resident community (De Bot et al., 2005). In the research, much attention was enthusiastic to learn a second language in a genuine language setting, but learners had restricted occasions to stay in that language setting for a long time (Shao, 2011). Moreover, MALL learners exhibited suggestively advanced levels of reported noticing, bottom-up and top-down understanding than the learners of instructor-manipulated language learning (IMLL) (de la Fuente, 2014). Furthermore, past literature also discovered that the explicit knowledge of comprehension questions was significantly sophisticated among the students of the MALL group compared to the IMLL group, as this could be valuable for the dispensation of target forms (Leow, 2001).

TECHNOLOGY, LEARNER, AND TEACHER'S ROLE IN ENGLISH LANGUAGE LEARNING

Over the years, the role of technology has varied, and three roles were identified for computers (Jones & Fortescue, 1987), i.e., "knower of the answer". "workhorse" and "stimulus". Over time, (Bax, 2003; Warschauer, 1996) defined three stages of CALL and

named them behaviourist, communicative, and integrative CALL because of their emphasis on drilling, utilizing the computer as an instrument for learning, and integrating technology in classrooms with the arrival of the postinternet era. A significant correlation was observed between the literacy levels of teachers concerning the usage of ICT, the regularity of using the Internet and the incorporation of ICT in language teaching (Hafifah & Sulistyo, 2020). Further research was performed to observe the part of ICT in education, and for this, the perspective of teachers was the focus. A study was conducted to observe the development of technology tools regarding teaching during the COVID-19 period (Akah et al., 2022). The study intended to assess the development of ICT in the COVID-19 period from the viewpoint of educators by focusing on the availability of these resources and the challenges being faced by the users of these modern tools. Moreover, instructional practices could be made more effective and improved by teachers' understanding of new technologies so that every student can access appropriate and precise material according to his prerequisite (Kessler, 2016).

Moreover, research has also indicated that calculated implementation and inclusive assessment are mandatory for the employment of WhatsApp so that more communication-associated practices can be provided to language learning students (Alamer & Al Khateeb, 2021; Karapanos et al., 2016). Furthermore, research has indicated that the incorporation of technology in the learning and teaching of the English language has amplified over the years in international institutes that have focused on the integration of modern technology in the learning and teaching process (Bello Nawaila et al., 2020). Moreover, non-English major EFL learners exhibited satisfactory behaviour towards online bilingual instruction and had optimistic perceptions towards learning by using the STEMUP application irrespective of their English proficiency, college, and gender (Tsai, 2022). It was further elaborated that the increase in learning interest and enthusiasm of learners were considered a main benefit of using these modern technologies in education, which directed to improved results (Bacca Acosta et al., 2019; Cabero-Almenara & Roig-Vila, 2019). Peer support combined with feedback from these technologies was measured as an effective approach instead of the isolated use of only these technologies or instructors' feedback (Putri Yaniafari et al., 2022).

INSTRUMENTATION

Most of the studies conducted regarding the use of mobile devices for education have been experimental and quasi-experimental (Alamer & Al Khateeb, 2021; Chen, 2022; Shadiev et al., 2022; Sim & Pop, 2014). To acquire data from study participants more accurately, the studies also used a combination of survey questionnaires and pretest and posttests (Al-Ahdal & Alharbi, 2021; Raffone, 2022; Sun et al., 2017; Tai & Chen, 2021; Tsai, 2022; Yang & Hu, 2022). Moreover, to better implement and systematize the findings of earlier literature, researchers also carried out a meta-analysis, as this would allow for effective implementation in the future. (Lin & Lin, 2019; Mahdi, 2018; Tseng et al., 2022).

GAPS IN THE STUDIES REVIEWED

Numerous studies have enhanced our intellect related to the design of systems to help learners learn vocabulary and listening skills through mobile devices and advocated the necessity for personalized learning, but very few studies have discussed the views and preferences of undergraduate ESL students regarding MALL and the role of MALL in improving lexical competence learners. The exploration of MALL was largely an uncharted territory in the setting of Pakistan, offering the researcher an opportunity to make a meaningful impact in the field of language learning by using modern technology. MALL was considered theoretically a very new field (Pegrum, 2014) and needed more information about its usage among students so that better input methods and approaches could be designed for students, which could be helpful for them to learn the language more efficiently. Although cited periodically in the research related to language learning, there is yet to be much literature on learning language through the usage of mobile devices.

POSSIBLE DIRECTIONS FOR FUTURE RESEARCH AND SCOPE FOR MALL IN PAKISTAN

In recent years, education has experienced revolutionary changes because of the advent of technology, and students must adopt these changes so that they can perform better in the current era of education. Due to this change in the educational process, because of technology, learners and instructors were going through different phases because of their acceptance, attitudes, and problems associated with the incorporation of technology and new methodologies of teaching and learning. The integration of technology in education has become a dire need of the current era, and mobile phones are the most portable and affordable technology of this current period, due to which their usage in education has gained much importance over the years.

In Pakistan, very nominal research has attempted to sightsee the use of MALL for vocabulary learning among undergraduate ESL university students of Punjab to understand the views and preferences of undergraduate ESL students about MALL along with the role of MALL in improving lexical competence for better implementation of MALL in vocabulary learning of English by using quantitative survey methodology. Moreover, it became evident that there are areas yet to be explored and questions that merit further investigation. These aspirations can drive the field forward, opening doors to discoveries and expanding the boundaries of knowledge.

The research findings are likely to provide an in-depth view of the usage of MALL for learning English vocabulary among undergraduate ESL learners in Punjab so that MALL could be integrated into education in a better and more effective way. Similarly, the findings can be helpful for educators, policymakers and practitioners regarding the implementation of MALL for learning English vocabulary so that learning vocabulary could be made more efficient and effective. In addition, learners can also become familiar with the potential of MALL in learning English vocabulary.

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