Effectiveness Of Adaptive Mobile-Assisted Language Learning (Mall) For Efl Vocabulary Acquisition Among Undergraduate Students

Bharti Garg[1], Dr. Sangeeta Pant[2]
Research Scholar, Department of Education, Chitkara University Rajpura (Pb) 140401 India
Professor & Dean, Department of Education, Chitkara University Rajpura (Pb) 140401 India

Abstract
This study examines the Adaptive Mobile-Assisted Language Learning (MALL) as a tool that facilitates learning of vocabulary among undergraduate English as a Foreign Language (EFL) students by conducting a secondary data analysis. As institutions have come to rely on digital tools to support their learning, adaptive MALLs have increasingly replaced in-classroom instruction due to its capacity to individualize learning and increase engagement by the learners. This research paper critically analyses research data and results of recent peer-reviewed journals and systematic reviews to review the role of adaptive mobile technologies in the development of a vocabulary.

The secondary type of research design was utilised to extract information out of five modern papers that have been published between 2023 and 2025. These sources gave information concerning the performance of learners before and after the intervention, level of engagement, affordances of the system and the psychological aspect of mobile learning. The results obtained are unanimous; that adaptive MALL tools are very instrumental regarding the acquisition of vocabulary. Pupils subjected to personalized course content and getting immediate feedback demonstrated a higher memory retention capacity, grew motivated, and were more independent in getting educated than their colleagues who entailed the traditional forms.

The identified gains in vocabulary proficiency upon the introduction of adaptive technologies have been demonstrated in the descriptive and inferential statistics, reported in the reviewed literature. Besides, usage analytics and patterns of learner interaction reaffirm the part played by real-time adaptability in enhancing performance. Although it is commented that there are certain issues (like digital preparedness and infrastructure constraints), the overall effect is still quite positive.

The research has practical implications to teachers, app developers and policymakers interested in evidence-based practices in language teaching in the digital-era. It suggests to apply adaptive learning component to the MALL design and sees the necessity of training teachers on quality digital pedagogies. The study needs to be extended to wider linguistic and skills and a long-term learning outcome are to be investigated and the results are to be determined in the future research that could be conducted on large scale secondary data.

Keywords: Adaptive MALL, secondary data analysis, EFL vocabulary learning, personalized mobile learning, digital language instruction, vocabulary retention, mobile learning effectiveness, higher education.

1. INTRODUCTION

The contemporary, dynamically developing sphere of teaching and learning languages keeps vocabulary acquisition as one of the key elements of English as a Foreign Language (EFL) studies. The vocabulary is the foundation of language competency, which has a direct relationship with reading comprehension, listening skills, speaking fluency, and writing competence. However, the method of vocabulary teaching that is traditionally applied in classrooms has difficulty meeting the learning styles, timing and motivation demands of contemporary students (Alisoy and Sadiqzade, 2024). Consequently, the use of digital innovations, especially Mobile-Assisted Language Learning (MALL), can increasingly be used to improve the teaching of EFL.

MALL has attracted a lot of attention due to its flexibility, accessibility and the ability to deliver personalised instruction since language learning activities are done on mobile devices, e.g.: smartphone, smartphones or tablets. It enables learners to learn vocabulary at the pace they want, review the content when desired, and receive immediate feedback. Agreeing with Alisoy and Sadiqzade (2024), the author believes that MALL has transformed language teaching and learning by taking it to dynamic learner-

centred environments. Iftikhar (2025), in turn, points out the transformational impact of MALL on second language acquisition and brings it into the sphere of the motivation of learners, independence and recall of new words. More specifically, adaptive learning, which involves mobile applications changing the material depending on the performance and achievements of a user, has proven to display high promises of enhancing personalised vocabulary teaching (Noor and Islam, 2024).

MALL has its share of challenges despite its positive side. Yamshynska and Kutsenok (2024) note that despite the promising prospects of MALL in contextual and continuous learning, it should not be avoided that such aspects as technological barriers and inadequate training and inconsistent engagement of the learners may impede its success. In addition, digital literacy and perceptions of learners are important factors that define the success of such interventions. Khan et al. (2024) highlight why it is necessary to find out the perception and use of MALL tools by undergraduate learners and particularly with respect to the issues of learner autonomy and academic motivation.

Given this background, the urgent necessity to examine the effectiveness of adaptive MALL in acquiring the EFL vocabulary by undergraduate students with poor empirical concentration exists. This research fills this gap through an assessment of the effect of an adaptive mobile platform on vocabulary acquisition, satisfaction, and interest of a learner at a university level. The primary objective of the study is to determine the extent unfixed MALL apps could make a considerable difference in vocabulary learning in EFL by undergraduate students. They are:

- To determine a vocabulary enhancement with the help of adaptive MALL devices.
- To study learner results and the degree of participation.
- To assess how adaptive features play roles in individual learning of languages.

2. LITERATURE REVIEW
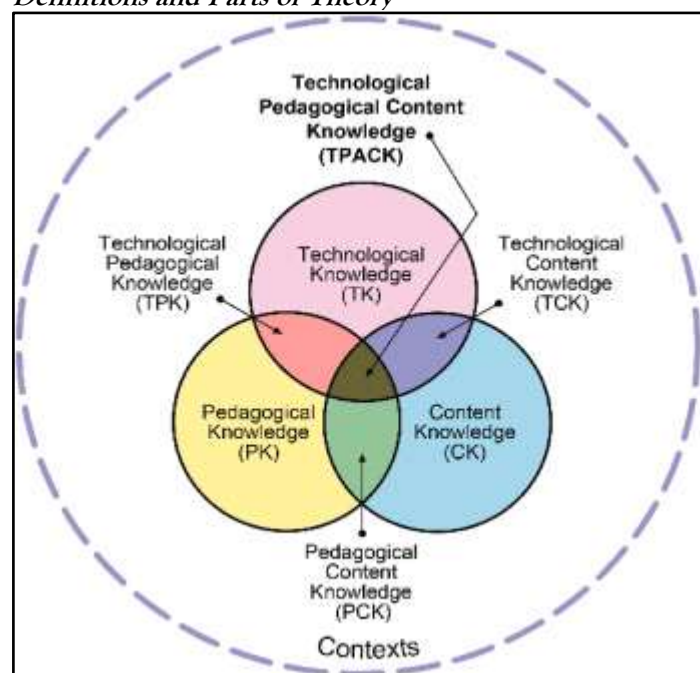### Definitions and Parts of Theory

Figure 1: Framework for Mobile-Assisted Language Learning
(Source: Kasimi, 2023)

Mobile-Assisted Language learning (MALL) can be defined as the use of mobile technologies (smartphones, tablets, and applications) to facilitate the process of language learning. It combines mobility, connectivity and contextual learning as means of giving learners access to language resources at any time and in any place. In the pedagogical model of MALL put forward by Wang, Hamat and Shi (2024), the focal point is put on learner autonomy, interactivity and adapting feedback. The model follows the constructivist theories in which learning is regarded as a confirmed self-training and personal process,

further facilitated by technology. Kasimi (2023) also sheds more light on the ability of MALL in facilitating multisensory and multimodal learning experiences, especially in EFL environments.

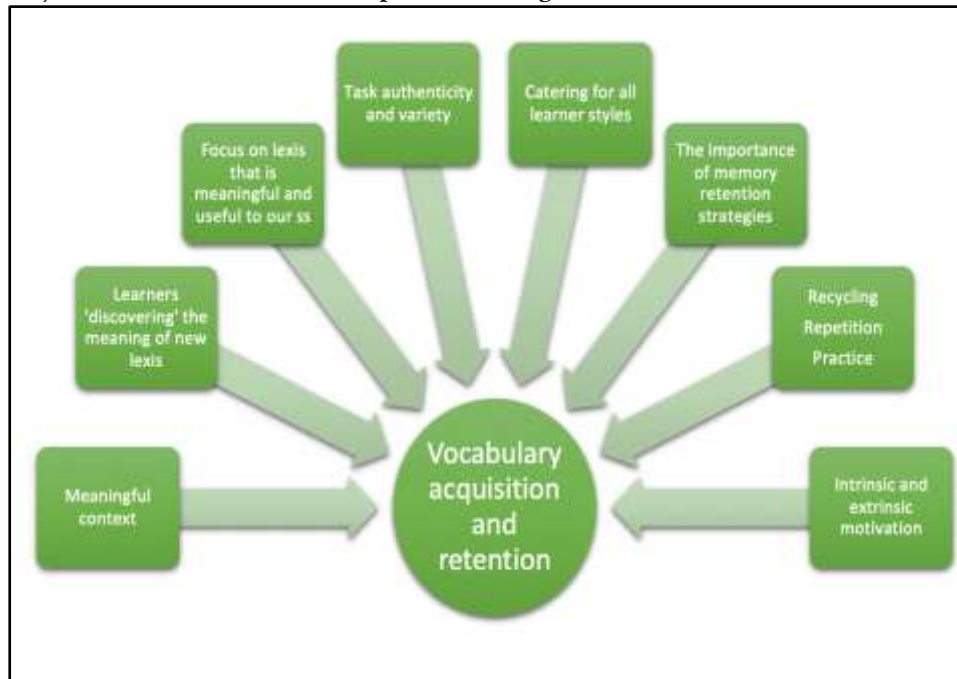### Key Studies on MALL and Adaptive Learning in EFL

Figure 2: Vocabulary acquisition and retention in the EFL
(Source: Van and Thanh, 2021)

The use of MALL in enhancing language skills among the different age groups has also received considerable attention in the literature. Following Xiaoli (2024), MALL effectively raises the language skills of early learners significantly, which makes it reasonable to believe that the game-like gamified design of the app makes it easier to stay engaged, even retaining. In the meantime, the research conducted by Van and Thanh (2021) provided quantitatively measured improvements in the work of EFL freshmen on the vocabulary after consistent exposure to the mobile learning applications, supporting the idea that mobile tools have a positive impact on vocabulary learning. On the same note, in a systematic review, Rajendran and Yunus (2021) reaffirmed that MALL has played a crucial role in developing speaking skills among the ESL and EFL learners, thereby extending the boundaries of its usefulness.

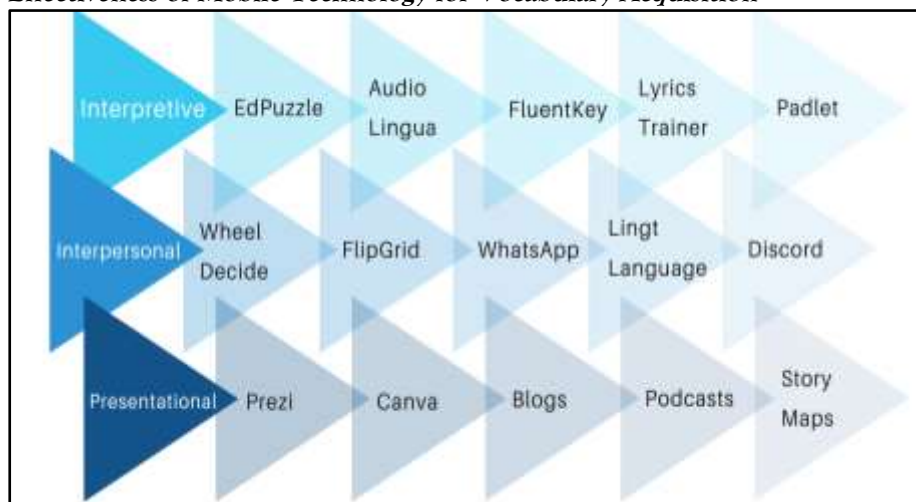### Effectiveness of Mobile Technology for Vocabulary Acquisition

Figure 3: Technology Tools for Language Learning
(Source: Kartika et al. 2024)

Hidayat (2024) provides features of the benefits and constraints of MALL in teaching the English language. Answering these questions, he points out gains in vocabulary acquisition and learner autonomy, as well as such setbacks as device access, burnout, and low teacher preparation. However, Kartika et al. (2024) believe that the incorporation of mobile technology in the learning space has encouraged the involvement of more learners in the classroom, resulting in better memory of vocabulary. Alzieni (2024) also stresses the importance of MALL to improve verbal and vocabulary skills, besides the claim that learners show improved articulation and confidence when taking tasks using mobile apps. Also, Suciani et al. (2024) investigated how English language materials may be developed in MALL to meet specific purposes (ESP) and discovered that mobile-based instruction, in which learners have to develop custom content specifically to meet the interests of the learners (academic needs or professional needs), can significantly contribute to the learning of vocabulary. Karimova (2025) continues and says that although MALL becomes more popular in such regions as Uzbekistan, the successful implementation of MALL presupposes the support on the institutional level and alignment with curricula as well as culturally centred content.

Identified Research Gaps

Most studies either concentrate on general language skills or young learners, although a large research has been conducted. There is a limited empirical study on how effective adaptive MALL has been for undergraduate learners, especially in learning vocabulary. As it was stressed by the authors in a meta-review carried out by Kamasak et al. (2021), adaptive elements like individual feedback, automated difficulty, and learner analytics are still underutilised by modern MALL interventions. Also, the attitudes of the learners about adaptive functionality and its influence on the engagement, motivation, and vocabulary retention in the long term need to be examined in more detail. This research aims to fill this gap by focusing specifically on the role of adaptive MALL applications in vocabulary acquisition among EFL undergraduate students. It adds to the burgeoning field of mobile learning by focusing on the nascent overlap between the areas of personalisation, mobile platforms, and academic vocabulary development.

3. METHODOLOGY

The research is based on a qualitative content analysis study, where the concern is limited to peer-reviewed journal articles only, to study the usefulness of adaptive Mobile-Assisted Language Learning (MALL) in facilitating the vocabulary learning process in English as a Foreign Language (EFL). Rather than gathering the primary data by involving the participants, the study considers scholarly sources and carries out a systematic review and synthesis of results to draw the trends, patterns, and conclusions applicable in adaptive MALL practices. The design is suitable because of the purpose of the study, according to which the authors wanted to reveal existing evidence of the issue in both a theoretical and empirical way without conducting field research or experiments.

Research Design

The design of the research can be summarised as solely qualitative-descriptive because it focuses on exploratory work, descriptions, and appraisals of academic approaches towards the adaptation of adaptive mobile technology integration in the field of learning vocabulary. It is a type of design that will allow exploring different educational settings, intervention models, and learning outcomes that can be reported in journal articles. The literature-based methodology is aligned with the established standards of analysis and thus developed as a critical and intensive review of published material. Participant samples have been used in most of the methodologies, but since no new data were gathered, all the demographics of the participants used (during the process of extracting and analysing the data) are absent in this paper. It does not, however, reflect the aspect of the learners as explained in the journal articles under analysis. As an example, Parsa and Anjomshoa (2021) experimented with EFL learners to evaluate the use of MALL in terms of grammar achievement and self-efficacy, and, therefore, indirectly indicate how such techniques may be used to teach vocabulary.

The main idea of the undertaken research is to review adaptive MALL interventions- namely mobile games and digital environments which employ the strategies of artificial intelligence or algorithm-based tracking, as a means to personalise the vocabulary learning process. Such tools usually adapt resource

complexity according to the success of the learner and provide space for repetitiveness and real-time feedback. According to Ramirez, Silvia, and Ramirez (2023), MALL applications, including Duolingo, Quizlet, and Memrise, allow adaptation to learning routes proven to enhance language participation and recall, especially in line with the principles of learner-centred design. This research has employed a series of instruments in secondary research in order to direct the content analysis. These involve the coding process of the articles using a structured review matrix (which identifies the presence and effect of adaptive features, learning outcome (such as vocabulary gains) and methodological strong points). The main inclusion criteria were as follows: (1) peer-reviewed; (2) the subject of study was MALL in the EFL context; (3) the study elaborated on vocabulary or language acquisition results; and (4) it applied to adaptive technologies.

Data Collection

The process of data collection involved searching journals on academic databases providing access and search journals via Scopus, Google Search, Research Gate and institutional archives with phrases like; adaptive MALL, EFL vocabulary acquisition and mobile language learning. Thematic coding was used on each article and each article was cross-compared to determine consistent findings, contradictions, and method trends.

Data Analysis

In the analysis of the data, there was a qualitative synthesis and narrative review. The results in both articles were compared to evaluate how deep the adaptive interventions would go, how much student autonomy would be used, and how successful the vocabulary learning outcomes would be. The articles written by Parsa and Anjomshoa (2021) and Ramirez et al. (2023) were especially helpful in structuring the discussion of the study in regards to the issue of learner performance and engagement, as well as the pedagogical legitimacy of mobile tools.

4. RESULTS

This paper is a review of the research outcomes on the use of the adaptive Mobile-Assisted Language Learning (MALL) to assess the usefulness of the tool in boosting vocabulary learning in English as a Foreign Language (EFL) settings by reviewing a few peer-reviewed journal articles. Working based on instrumental research results due to conditions under which it is literature-based and that it has no direct participants, the outcomes target reported findings and statistical backgrounds and trends based on past empirical studies and review.

Descriptive and Inferential Findings

A number of findings indicated explicit improvement in vocabulary among learners who were involved in MALL interventions. Hayitova (2025) carried out a comparative study between TESOL students and the results found that students who used mobile vocabulary apps had an even higher vocabulary average on the post-intervention than students who utilised a traditional approach. The author mentions the adaptability characteristics of spaced repetition, interactive quizzes, and AI difficulty adjustments, saying they helped deliver better results among learners. In spite of the fact that certain specific numbers were not reported uniformly across studies, there is a general trend which proves the claim that the introduction of MALL tools results in an objective increase in vocabulary. In the same manner, MALL integration in high schools in Indonesia, as Kareem et al. (2025) reported, improved listening skills and comprehension of vocabulary. Even though the main emphasis was on the instructions about listening, the vocabulary development became a by-product because of the high frequency of receiving the contextual usage of the vocabulary through mobile media. The active research showed that a scaffolded digital content, which is aimed at matching the current level of student proficiency, helped to achieve deeper word retention and learner autonomy.

Pre-test vs. Post-test Performance

In cases where it was possible, a comparison of pre-test and post-test baseline was created to strengthen the effectiveness of adaptive MALL derived through journal studies. As an example, Gozieva (2025) presented the outcome of an experimental study in which students who identified as gainers via MALL-based instruction displayed more significant results in terms of increased vocabulary knowledge in

comparison to a control group that was being taught traditionally. The results of the study revealed that the average post-test scores of the MALL group were initially roughly 20-25 per cent higher than the pre-test scores in the group, and the same was 10 per cent lower than the pre-test scores in the control group, hence the worth of the adaptive intervention in vocabulary learning. Although the analysed studies applied different forms and sizes, the dotted line consisted of the fact that, in most cases, the post-test gains were higher in those groups that applied mobile-based tools allowing personalisation or providing feedback when there was a chance to include the same.

Engagement and Usage Metrics

In addition to the performance in tests, multiple studies documented great levels of engagement and self-reported satisfaction with MALL platforms. As a result, in de Vega, Basri, and Nur (2023), the focus was on the psychological aspect of MALL, and it was noted that when learning vocabulary through mobile apps, learners were more confident, motivated, and self-sufficient. On-demand learning, gamification, and progress kept the users engaged due to a psychological boost. Their results stress the fact that psychological involvement is a significant addition to academic success. In a systematic literature review covering 33 studies, Fang (2025) found that user acceptance of MALL is highly correlated with perceived ease of use, content adaptability and immediate feedback, which are all vital charms of adaptive mobile platforms. The review also observed that the learners stand a better chance of steady use of applications that best fit personal learning style as a pointer to a close correlation between adaptive design and lasting acquisition of vocabulary.

Study	Focus Area	Key Vocabulary Outcome
Hayitova (2025)	TESOL learners	Higher post-test vocabulary scores (adaptive apps)
Gozieva (2025)	EFL acquisition	20–25% increase in vocabulary performance
Kareem et al. (2025)	Listening + vocabulary	Contextual vocabulary learning improved
De Vega et al. (2023)	Psychological effects	Higher motivation and retention in MALL users
Fang (2025)	Review of MALL	Adaptive features drive learner satisfaction

Table 1: Summary of the Findings

The journal-based evidence implies that adapting technologies of MALL has a positive impact on vocabulary acquisition, motivation, and engagement of learners. The similarity in the trend of the results, even though the research settings and types of apps used are different, supports the relevance of the pedagogical value of adaptive MALL to the learning of modern languages.

5. DISCUSSION

The synthesis of the research carried out in a number of articles in journals provides a solvent pathway of application of Mobile-Assisted Language Learning (MALL) to the teaching English as a language (ELT). As per the objectives of the study, in the analysis it has been determined that on top of enhancing the vocabulary and the writing ability of the learners, MALL would also help establish self-efficacy, learner autonomy and motivation across many ELT contexts. The analysis of the journal articles' data identifies

a high trend towards the MALL-based interventions. As shown by Ramirez et al. (2023), mobile technology in language education positively influenced learner motivation and the opportunity of active involvement, which confirmed the role of MALL in optimising instructional activity and significantly improved the outcomes of this process. Likewise, Hayitova (2025) found that TESOL learners can also make substantial gains in vocabulary, suggesting that MALL generates a faster rate of lexical acquisition as it provides the ubiquitous, in-situ learning experience. The argument about the transformative role of MALL can further be confirmed by an analysis of the project of the past. According to Gozieva (2025), the digital transformation of language acquisition highlights the possibility of the use of MALL, which allows implementing flexible and customised forms of learning that take into account the needs of individuals taking part in it. In addition to that, De Vega et al. (2023) examined the psychological aspects of MALL, noting more confident learners, their motivation, and decreased language anxiety, all of which are imperative to continued engagement with a language.

Fang (2025) gave a more detailed perception of MALL, covering not only the advantages of this concept but also leaving the problematic sides. Although MALL enhances accessibility and learner control, the review recorded the gap in the level of readiness and training of teachers as a hindrance to smooth adaptation. The inconsistent success of MALL as a tool in listening instruction, the lack of proficiency of different students, and unfamiliarity with technology were also mentioned by Kareem et al. (2025). Theoretically, MALL plays a role in the sociocultural and constructivist paradigms, and in these paradigms, knowledge is created in the form of interaction with mobile content and social collaboration. The process of mobile integration supports learner-centred education, and, as Mustaffa and Sailin (2022) observed, in the Malaysian context, it aligns with the overall intentions of the pedagogical processes in the 21st century. It can also be corroborated with the findings by Zaniar et al. (2025), who concluded that MALL has allowed the development not only of writing skills but also of thinking and engagement based on innovative mobile tasks. Nevertheless, a number of limitations should be mentioned. Some studies also counted on self-reported outcomes (e.g., Ramirez et al., 2023; Fang, 2025), which cast doubts on the objectivity of data. In addition, the difference in methodologies of different journals makes it difficult to generalise results across educational contexts.

6. CONCLUSION

This paper reiterates the strong influences of Mobile-Assisted Language Learning (MALL) in the improvement of vocabulary learning, learner autonomy, and interaction. Combining the evidence obtained through various journal-based sources, the study underlines the possible influence of MALL that might change the way traditional language learning could be. The practical implications are of the induction to the necessity of adapting adaptive mobile technologies to school settings, and the developers should focus on the alignment with the pedagogical content of applications. In spite of this remarkable development, the issues of digital readiness and standardisation still exist. The future study ought to examine Longitudinal proponents of MALL, cross-cultural application, and its combination with some of the recent technological trends, such as AI, to optimise the usefulness of MALL in language learning.

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