

Mobile-Assisted Language Learning Toward Vocabulary Skill Enhancement of the BSEd-English

DOI: 10.5281/zenodo.14848956

Charlene J. Laureto

Researcher, Mandaue City College, Mandaue City, Cebu, Philippines
<https://orcid.org/0009-0007-1206-3331> | lauretocharlene3@gmail.com

Mariel C. Dacullo

Researcher, Mandaue City College, Mandaue City, Cebu, Philippines
<https://orcid.org/0009-0001-3945-585X> | marieldacullo.viixixmmxix@gmail.com

Michelle A. Cal

Researcher, Mandaue City College, Mandaue City, Cebu, Philippines
<https://orcid.org/0009-0002-9920-8727> | mitchcal40@gmail.com

Lourdyl F. Fuentes

Researcher, Mandaue City College, Mandaue City, Cebu, Philippines
<https://orcid.org/0009-0006-9377-3513> | lourdylfuentes@gmail.com

Angelica Tapi

Researcher, Mandaue City College, Mandaue City, Cebu, Philippines
<https://orcid.org/0009-0006-5722-6096> | tapiangelica94@gmail.com

Abstract:

The portability and accessibility of mobile devices facilitate learning everywhere, leading to increased vocabulary learning and improved motivation for vocabulary acquisition. The study aimed to determine the effectiveness of Mobile Assisted Language Learning (MALL) as a personalized learning tool in enhancing the vocabulary skills of first-year BSED-English students at a local college. This study utilized the experimental research design, employing pre-tests and post-tests to comprehend if MALL is an effective tool for enhancing vocabulary skills. A standardized vocabulary test paper from the Victoria University of Wellington and an adopted attitudinal survey questionnaire from Rezaie, et al. (2014) were used in this research study to aid the researchers in collecting the data needed to determine the effectiveness of MALL. Based on the results, during the pretest that was done before the treatment program, the mean score of the respondents was 19.75, meaning the respondents had low vocabulary skills. However, during the post-test and after using MALL tools in two weeks, the mean score significantly increased to 33.92, this showed that MALL tools are effective in their vocabulary retention and statistically significant. MALL tools Although more research is required, data analysis suggests that using mobile phones for vocabulary learning is a feasible approach for college students. It can be used as a substitution, augmentation, and modification to a pencil and paper-based vocabulary assessment. As a result, the researchers proposed an action plan suggesting that incorporating MALL tools into language education programs can be beneficial in helping students improve their vocabulary skills.

Keywords: Mobile Assisted Language Learning, SAMR Model, vocabulary skill enhancement, personalized learning tool, Mobile Language Learning Applications.

Introduction:

The ability to communicate effectively and understand vocabulary was critical for BSED English students, establishing the foundation for effective teaching and communication with future students and jobs as educators. Mobile devices, in today's technologically driven society, provide a novelty and potentially transformative approach to language learning, particularly vocabulary development. The continuous development of mobile devices has brought new ideas and possibilities to the field of vocabulary teaching. Digital devices were essential to the daily educational process due to their performance and appeal to learners. According to Nureani et al. (2020), mobile phones have been extensively researched for their educational benefits, highlighting MALL as a contemporary learning strategy that can make vocabulary study more enjoyable and effective. MALL's interactive and individualized nature made the vocabulary study more pleasurable and long-lasting, creating a positive attitude toward language acquisition. Andrici (2012), as cited by Katemba (2021), points out that students with vocabulary deficits often struggle with poor word comprehension and lack motivation. Katemba (2019) adds that the complexities of the English language, including its diverse structures and pronunciations, pose additional challenges for vocabulary acquisition. The study reveals a concerning statistic: only 33% of BSED English students passed the vocabulary test, indicating that their vocabulary skills are underdeveloped. Innovative approaches that were tailor-made to reinforce vocabulary skill enhancement will therefore need to be explored

– one potential solution investigated by this study was Mobile Assisted Language Learning (MALL). Also, various studies have examined the effectiveness and usefulness of integrating Mobile Assisted Language Learning tools inside the classroom as technological support. However, there were only a few that investigated the effectiveness of integrating mobile-assisted language learning tools as personalized technology vocabulary learning support. In order to address these challenges, the study investigates the effectiveness of using mobile-assisted language learning tools as personalized support to improve vocabulary skills. Tanjung (2011), also cited by Katemba (2021), notes that students often lack motivation and struggle to memorize vocabulary. To counter this, the study sent target vocabulary directly to students' mobile phones to encourage learning. With the help of the SAMR model, the researchers established the significance of its tiers, particularly the substitution, augmentation, and modification levels, in comprehending how mobile-assisted language learning provides a schema as to how students can assess and redefine their learning activities using MALL to become more innovative in improving their vocabulary skills. It also aided the researchers to reach the aim of this study, and that is to analyze how Mobile-Assisted Language Learning applications can impact student motivation and engagement in vocabulary learning within BSED-English. Specifically, this study sought to answer the following questions: (1) What was the mean score of the vocabulary proficiency of the BSED-English in pre-test and post-test? (2) To what extent of the effectiveness of the MALL platform in the vocabulary skill enhancement of the BSED-English in terms of motivation, cognitive, and instructional material? And (3) Was there a significant increase in the mean score of the post-test vocabulary exam of the BSED-English students after utilizing MALL platform?

Literature Review:

Mobile Assisted Language Learning (MALL) has emerged as a promising method for improving vocabulary skills among BSED English students. Liu (2016) found that the instant idea feature of MALL boosted vocabulary comprehension and memory, outperforming traditional teaching methods. With the increasing accessibility of smartphones and mobile applications, MALL offers a simple and engaging option for learners to learn new vocabulary and practice language skills outside the classroom. Studies have shown that MALL has a moderate-to-large effect size on the development of EFL learners' listening skills, including vocabulary. Mobile-assisted language learning applications with gamification components can build up vocabulary learning motivation and engagement, aligning with self-determination theory. Rassaei (2020) stated that EFL learners benefit from extra vocabulary support provided by peers and instructors, which helps them expand their vocabulary knowledge. Overall, MALL represents a modern and technology-driven approach to language education, leveraging the benefits of portable devices to create engaging and effective learning environments.

MALL as a Motivational Tool

Education should be adaptable to individual needs and preferences so that learners can take responsibility for their learning and be motivated to continue. The idea is that with a flexible and effective training method, learners are more likely to be positive about vocabulary and learning progress. Integration of Mobile Assisted Language Learning, enhanced motivation by making vocabulary learning more enjoyable and empowering learners with a sense of control and capability. This positive effect on motivation is supported by different studies, highlighting the role of feedback, accessibility, and dynamic learning experiences provided by mobile devices. In their studies, Klímová & Poláková (2022) found that participants believed feedback aided in the acquisition of new vocabulary items, ultimately improving language skills. Portable devices such as mobile phones contributed to this effect by being easy to carry around and accessible at any time. Moreover, learners' acceptance and perception of the effectiveness of MALL are shaped by their experiences of enhanced vocabulary acquisition, as well as their views on its usefulness and ease of use. MALL has been shown to enhance motivation in learners by making vocabulary learning more enjoyable and empowering them with a sense of control and capability. This positive effect is supported by studies highlighting the role of feedback, accessibility, and dynamic learning experiences provided by mobile devices. Gürkan (2018), Butarbutar (2020), & Kohnke (2020) found that mobile apps boost students' motivation due to their enhanced enjoyment when compared to traditional learning methods. The accessibility and convenience of mobile learning make the educational process more dynamic and adaptable to individual learning styles, contributing to a positive attitude toward learning. The integration of mobile technology offers benefits such as enhanced communication, skill retention, flexibility, and accessibility, enriching the overall language learning experience. Mobile applications have significantly improved vocabulary through Mobile-Assisted Language Learning. This method helps understand how users accept and use technology, influencing system design elements, perceived usefulness, ease of use, attitude, and usage behavior. The model assesses the perceived usefulness of mobile applications in teaching and learning.

MALL as an Instructional Material

In the Philippines, the integration of ICT has become a crucial tool in enhancing learning. The study by Lim & Arcilla (2021) introduced 'Mobile Assisted Language Learning', which uses electronic devices to replace insufficient textbooks and instructional materials. It was implemented to provide access to electronic devices to replace insufficient textbooks and instructional materials during the learning process. This approach was influenced by student interest in personal learning and the ability to engage with others, which is essential for language acquisition. Mobile devices, such as tablets, smartphones, and wearable devices, provide accessible learning resources and opportunities for interaction. The alternative to conventional learning materials is the use of cell phones. Even when there are no textbooks or other

materials available, mobile-assisted language learning allows students to utilize resources and tools directly from their phones. It allows access to education to be democratized and offers a potentially more engaging experience. Personal learning and student engagement can be enhanced by the use of mobile learning. This concept, supported by sources like Viberg & Gronlund (2012), cited from the study of Shortt et al. (2021), they believed that mobile learning is a branch of portable technology that has the potential to be utilized for educational aims. Mobile applications are recommended to create an enjoyable and captivating learning atmosphere, enhancing students' interest and participation. Recognized as indispensable components of language education, vocabulary learning apps are now firmly situated within the mainstream of mobile language learning. The use of mobile devices allows for immediate and personalized feedback, which can play a crucial role in acquiring new vocabulary and enhancing language abilities.

Mobile Assisted Language Learning, incorporates vocabulary learning apps into the curriculum, as they are crucial for language education. Instructional technologists focus on vocabulary app advancement and its impact on vocabulary acquisition, especially in EFL classrooms. Teachers must consider the preferences of target learners, as there is no universal method for achieving language proficiency. Despite the doubt, some learners have found that using various apps enriched their vocabulary knowledge by the end of the course.

Effectiveness of MALL in the Cognitive Domain for Vocabulary Skills Enhancement

The advancement and sophistication of mobile technologies have created new opportunities for language learning, both inside and outside the classroom. Learners could engage in activities that are directly or indirectly related to language learning and interact/communicate with other people in the target language, which could enhance the utilization and retention of the newly acquired language knowledge. According to Yang (2025) using a Mobile-Assisted Language Learning (MALL) approach to enhance vocabulary skills has shown promising effectiveness in the cognitive domain, especially in terms of memory, comprehension, and retention. MALL allows learners to access vocabulary learning apps or platforms that adjust to their individual learning pace, style, and level. Personalized exercises can cater to specific vocabulary needs, making the learning process more effective. The prevalence of mobile learning has the potential to revolutionize language instruction, transforming how individuals learn in different settings and subject areas such as language acquisition as stated by Kaceti & Klímová, (2019). Kukulska-Hulme & Chapelle (2020) adapted the definition of MALL as the use of smartphones and other mobile technologies in language learning, especially in situations where portability and situated learning offer specific advantages. Mobile-assisted language learning, is gaining scholarly attention for its effectiveness in the cognitive domain for vocabulary skills enhancement. It focuses on vocabulary acquisition, speaking, listening, and general language acquisition for learners. Mobile apps are known for their genuine, engaging, and delightful nature. MALL has the potential to revolutionize language instruction, transforming how individuals learn in different settings and subject areas.

Overall, previous research findings were combined, and they provided an appealing picture of the effectiveness of mobile-assisted language learning's potential as an essential tool for vocabulary development in BSED English programs. It emphasized not just the utility of mobile-assisted language learning applications, but also the importance of engaging pedagogical approaches within mobile-assisted language learning applications to fully realize the potential for learners. It highlighted the need for simple and engaging tools that students regard as valuable to their learning path, leading to vocabulary skill enhancement.

Research Method:

A quantitative experimental design, particularly the pre-test and post-test, was used to gather rich data on the respondents' vocabulary proficiency and their inclination towards utilization of MALL. The respondents of this study were first-year BSED-English learners studying at Mandaue City College, during the school year of 2023-2024. The researchers selected the first-year because their subjects are still in general, and this year level is the perfect starting point for introducing and implementing an effective action plan about utilizing MALL towards vocabulary retention. Furthermore, the researchers employed non-probability sampling, particularly total population sampling, as a sampling method, to identified low-margin errors and produced accurate results that were feasible in real-time. Other than that, the instruments such as a standardized pre-test & post-test vocabulary exams adapted from the Victoria University of Wellington Vocabulary Lists and a standardized attitudinal questionnaire, adapted from the study of Rezaie et al. (2014), was wielded to aid the researchers during data collection. Moreover, the researchers observed a step-by-step approach when collecting the data. First, the researchers conducted a pre-test to determine the vocabulary skills of the respondents before using any MALL applications. Then, they conducted a brief orientation of what MALL is about, its purpose, and how to manipulate it in several ways to aid the respondents in their vocabulary skill enhancement. The researchers gave the respondents access to the MALL tools and asked them to use them for two weeks to improve their vocabulary proficiency. During the intervention period, the researcher monitored the respondents' progress, providing support and guidance as needed. When the intervention course ended, a post-test assessment and attitudinal survey commenced to determine the vocabulary skills of the respondents after using MALL tools and assess the BSED-English aptitude towards MALL as a personalized technology learning tool for vocabulary skill enhancement. To interpret the raw data collected by the researchers, the researchers used the T-test and weighted mean statistical tools. Withal, the researchers applied ethical principles and procedures and abided by all means of requirements needed before conducting the study to certify

the credibility and rigor of the study. The researchers highly acknowledged the voluntary participation of each participant however, they have the right to withdraw their sincere participation in the study if they desire to do so. The researchers adhere to the confidentiality and anonymity of the participants' information for their privacy under the Data Privacy Act of 2012. In conducting this study, the researchers noted the three basic concepts such as (1) obtaining informed consent from potential research participants; (2) minimizing the risk of harm to participants; (3) protecting their anonymity and confidentiality.

Findings and Discussion:

The gathered data was presented through tabulation in accordance with the posited questions and was analyzed and interpreted by the researchers.

Vocabulary Proficiency

Vocabulary Proficiency was a vital facet in language learning as it aids the respondents to communicate, understand text, and access prior knowledge. The raw scores and mean scores of the pre and post-test of the BSED-English vocabulary exam was presented in Table 1.

Table 1.
Pre-test & Post-test Mean Scores

Respondents	Pre-test	Post-Test
Respondents 1	19	33
Respondents 2	26	26
Respondents 3	13	36
Respondents 4	20	36
Respondents 5	17	47
Respondents 6	14	25
Respondents 7	14	32
Respondents 8	23	34
Respondents 9	20	16
Respondents 10	11	39
Respondents 11	20	36
Respondents 12	22	36
Respondents 13	18	41
Respondents 14	17	45
Respondents 15	21	29
Respondents 16	20	19
Respondents 17	25	37
Respondents 18	15	25
Respondents 19	20	31
Respondents 20	16	38
Respondents 21	20	35
Respondents 22	27	32
Respondents 23	33	39
Respondents 24	23	47
Mean Score	19.75	33.92

In Table 1, the mean score of the pre-test is 19.75 out of 50, with the topmost score of 33 and lowest score of 11, which means all of the respondents failed to reach the passing score. Meanwhile, the mean score of the post-test is 33.92 out of 50, with a highest score of 47 and a lowest score of 16, indicating an increase of most respondents' scores with the difference of 14.17. With the same result on the study of Simanjuntak (2020), who conducted pre-test and post-test,

appears that with a difference of 7.37 between the mean scores of pre-test and post-test the scores are positively skewed and shown apparent differences in the score distribution. With this, table 1 indicated that there was a momentous improvement of most of the respondents' vocabulary retention and acquisition after employing MALL through manifesting higher scores during the post-test unlike in the pre-test. However, there was a discrepancy reflected in Table 1, where the scores of respondents 9 & 16 decreased even more during the post-test because they were absent during the intervention period. Another, the score of respondent 2 remains the same even though the respondent was present during the intervention period, this is due to lack of interest and this indicates that even though MALL had been proven to be an effective tool for vocabulary retention, in the end it is still the preference of the user if they will utilize this tool to improve their vocabulary skill. In accordance to the study of Lord (2015), which was mentioned by Loewen et al. (2019) that there was still reported issues about the students' learning persistence and motivation of enforcing MALL in the second language learning.

MALL Effectiveness

The inclination of the respondents about how MALL tools can be a motivating tool to enhance their cognitive aspect in vocabulary retention, as well as its effectivity as an instructional material was presented in Table 2.

Table 2.
Effectiveness of MALL

	Weighted Mean	Description Equivalent
Motivation	3.19	Agree
Cognitive	3.14	Agree
Instructional Material	3.32	Agree

Based on Table 2, it shown a survey on the effectiveness of a Mobile Assisted Language Learning (MALL) platform on vocabulary skill enhancement among BSED ENGLISH students. The table has three categories: Motivation, Cognitive, and Instructional Material. Motivation had a weighted mean of 3.19, which was described as "Agree". This suggested that the BSED English students agree that the MALL platform was motivating for vocabulary skill enhancement. Cognitive had a weighted mean of 3.14, which is also described as "Agree". This suggested that the BSED English students agreed that the MALL platform was helpful for cognitive aspects of vocabulary skill enhancement. Instructional material had a weighted mean of 3.32, which was described as "Agree." With this, the data supports the conclusion of Al-Ahdal & Alharbi (2021) that utilization of mobile phones as a study device aided the students in better vocabulary retention. It entailed that MALL can be a motivating tool to enforced in the vocabulary skill enhancement, stipulated in the study of Rezie et al. (2014), that mobile applications motivate the students to enhance their vocabulary skill for it created excitement and variety in the learning process. Also, MALL produced cognitive benefits to the students, corresponding to the study of Kamasak et al. (2020), saying that the practical and engaging characteristics of MALL contributed to the cognitive aspect and vocabulary acquisition of the students. Lastly, it had the potential to be used as instructional material in vocabulary learning if it is strategically integrated, relating to the study of Sherine & Supriya (2020), they examined that MALL can be classified as a relevant instructional tool in vocabulary skill enhancement considering its potential to improve the vocabulary learning among English learners. Taken from the study of Wang & Gunaban (2023), they concluded that MALL was known as an ally on English language learners in general, for it reckoned new contents in enhancing the English language skills.

Significant Difference of the Mean Scores

The table below unveiled that there was a significant increase of the mean scores during pre and post-test to attest the efficacy of MALL integration.

Table 3.
T-Test Result

Sample	N	Mean	StDev	pValue	Decision	Interpretation
Pre-Test	24	19.75	4.96	0.000	Reject Ho	Significant
Post-Test	24	33.92	7.85			

Table 3 presented the mean scores of the tests. The mean score for the pre-test is only 19.75, with the highest score of 33 out of 50 and the lowest score is 11 points. Whereas, the post-test mean score is 33.92, with scores ranging from 16 to 47. As can be observed in the table, at a 0.05 percent level of significance, the calculated p-value of 0.000 is less than 0.05. Thus, there was a significant increase in the mean scores after utilizing the MALL tools (Meriam Webster Dictionary Application & Google). In relation with this, the result agreed to the study of Thanh & Van (2021) where the calculated p-value of their study is .000 shows that the difference between pre and post-test attained an analytical significant degree of utilizing MALL in vocabulary retention.

Furthermore, the data entails that, MALL applications helped students learned the vocabulary words more engagingly, effectively, and dynamically – complementary to the study of Nur et al. (2023) suggested that integrating MALL in English language teaching led to a positive impact and provide various benefits to the teacher and student. Additionally, the study of Fageeh (2013), said that the portability and accessibility of MALL allowed students to have more opportunities to hone and strengthen their vocabulary knowledge. In addition, the progress after using MALL illustrated that it influenced the students positively, especially in context and vocabulary retention.

Conclusion:

Based on these findings, the researcher concluded that the implementation of Mobile Assisted Language Learning (MALL) was also effective in improving students' vocabulary retention. Data from the study indicated that initially, students scored low on the pretest, indicating a lack of vocabulary knowledge. However, after using the MALL tools, there was a significant increase in their post-test scores, with most students scoring closer to the mean. The SAMR (Substitution, Augmentation, Modification, and Redefinition) model offered a structured approach to integrating technology into the MALL framework, aiming to enhanced the vocabulary skills of the BSED ENGLISH respondents. By following the different stages of the SAMR model, researchers effectively have utilized MALL tools to optimized the learning the vocabulary skills of the respondents.

The study also revealed that students found the MALL platform encouraging and academically inspiring, further supporting the effectiveness of these tools in improving vocabulary. As a result, incorporating MALL tools into language education programs can be beneficial in helping students learn words more effectively and improved their overall vocabulary.

Recommendation

The following recommendations are offered based on the work accomplished during this research and on the conclusions given previously:

1. Based on findings showing the effectiveness of improving students' vocabulary retention, they are encouraged to use MALL tools.
2. The results showed that the use of a mobile language learning tool in teaching practices increases students' linguistic vocabulary competence. In the context of BSED English programs, it demonstrated that mobile language assistance tools are effective.
3. The study provides a basis for further research into the role of MALL in improving vocabulary skills for future researchers. It will help future researchers to understand the usefulness of mobile language learning tools for students' vocabulary development.

Limitations and Further Research:

The empirical findings disclosed herein are susceptible to considerable limitations. Firstly, this study was only limited to twenty-four (24) respondents from a single community college. Second, the raw data of this research heavily confided in the respondents' self-report and autonomy, so it is not guaranteed to be bias-free. Third, although the researchers used an experimental research design, no control group was involved in the comparison due to population constraints. Fourth, the length of how this study was conducted, particularly during the intervention period, is brief due to time limitations, wherein it should take a long time, considering that this study is experimental research. Lastly, despite the fact that MALL applications and tools were proven to be effective in vocabulary learning, the respondents' individual characteristics in preference and learning style still vary.

Moreover, the researchers of this study further suggested that when choosing MALL tools and applications for vocabulary retention, it is best if future researchers create their own application or tool. In this way, they can adjust and personalize the content and the words they put in their app fitting to the vocabulary capabilities of their target respondents.

References:

- Ahmad, K. S., Armarego, J., & Sudweeks, F. (2017). The Impact of Utilising Mobile Assisted Language Learning (MALL) on Vocabulary Acquisition among Migrant Women English Learners. *Interdisciplinary Journal of e-Skills and Lifelong Learning*, 13, 037-057. <https://doi.org/10.28945/3703>
- Butarbutar, R. (2021). Learner's perception of task difficulties in technology-mediated task-based language teaching. *Englisia Journal of Language Education and Humanities*, 9(1), 129. <https://doi.org/10.22373/ej.v9i1.10079>
- Fageeh, A. A., I. (2013, December 1). Effects of MALL Applications on Vocabulary Acquisition and Motivation – AWEJ. (n.d.). DOI: <https://awej.org/effects-of-mall-applications-on-vocabulary-acquisition-and-motivation/>
- Gürkan, S. (2018). The effects of a mobile assisted vocabulary learning application on vocabulary learning. *Turkish Online Journal of Qualitative Inquiry*, 9(3), 288-311. <https://doi.org/10.17569/tojqi.407512>
- Kaceti, J., & Klímová, B. (2019). Use of Smartphone Applications in English Language Learning—A challenge for Foreign Language Education. *Education Sciences*, 9(3), 179. <https://doi.org/10.3390/educsci9030179>
- Kamaşak, R., Özbilgin, M. F., Atay, D., & Kar, A. (2021). The effectiveness of Mobile-Assisted Language Learning (MALL). In *Advances in mobile and distance learning book series* (pp. 194-212). <https://doi.org/10.4018/978-1-7998-4769-4.ch008>
- Klimova, B., & Polakova, P. (2020). Students' perceptions of an EFL Vocabulary Learning Mobile Application. *Education Sciences*, 10(2), 37. <https://doi.org/10.3390/educsci10020037>
- Kohnke, L. (2019). Exploring learner perception, experience and motivation of using a mobile app in L2 vocabulary acquisition. *International Journal of Computer-Assisted Language Learning and Teaching*, 10(1), 15-26. <https://doi.org/10.4018/ijcallt.2020010102>
- Kukulska-Hulme and Chapelle, (2020). "Learner's Attitudes toward the Effectiveness of Mobile Assisted Language Learning (MALL) in Vocabulary Acquisition" DOI: [jeltim.v3i2.49813](https://doi.org/10.1002/jeltim.v3i2.49813)
- Lei, X., Fathi, J., Noorbakhsh, S., & Rahimi, M. (2022). The impact of Mobile-Assisted Language learning on English as a Foreign language Learners' vocabulary learning attitudes and Self-Regulatory capacity. *Frontiers in Psychology*, 13. <https://doi.org/10.3389/fpsyg.2022.872922>
- Lim, RA. & Arcilla Jr., FE. (2021). Mobile assisted language learning: Perspectives from senior high school students. *International Research Journal of Science, Technology, Education, and Management*, 1(2), 108-118. <https://doi.org/10.5281/zenodo.5726387>
- Liu, P.-Lin. (2016). Mobile English vocabulary learning based on concept-mapping strategy. *Language Learning & Technology*, 20(3), 128-141. <http://dx.doi.org/10.125/44485>
- Loewen S, Crowther D, Isbell DR, et al. (2019). Mobile-assisted language learning: A Duolingo case study. *ReCALL*. 31(3):293-311. doi:10.1017/S0958344019000065
- Nur, S., Butarbutar, R., Ardiningtyas, S. Y., & Alimuddin, A. H. (2022). A Systematic Review on Integrating MALL in English Language teaching. Nur | *ELT Worldwide: Journal of English Language Teaching*. <https://doi.org/10.26858/eltww.v9i1.30409>
- Rassaei, E. (2020). Effects of Mobile-Mediated Dynamic and No Dynamic Glosses on L2 Vocabulary Learning: A sociocultural Perspective, 104(1), 284-303. Doi: [10.1111/model.12629](https://doi.org/10.1111/model.12629)
- Rezaei, A., Neo M., & Pesaranghader, A. (2013). Effectiveness of Using English Vocabulary Mobile Applications on ESL's Learning Performance. Conference: Informatics and Creative Multimedia (ICICM). DOI:10.1109/ICICM.2013.27
- Sherine, A. J., & Supriya, M. J. (2020). Promoting Vocabulary Learning Through MALL: A comparative study. *International Journal of Advanced Research in Engineering and Technology (IJARET)*, 11 (2), pp 223-230. DOI:10.34218/IJARET.11.2.2020.022
- Shortt, M., Tilak, S., Kuznetcova, I., Martens, B., & Akinkuolie, B. (2021). Gamification in mobile-assisted language learning: a systematic review of Duolingo literature from public release of 2012 to early 2020. *Computer Assisted Language Learning*, 36(3), 517-554. <https://doi.org/10.1080/09588221.2021.1933540>



Simanjuntak, R., (2020). Learning Specific Academic Vocabulary Using MALL: Experience from Computer Science Students. Bina Nusantara University, 20(5), p87-107. DOI: <https://doi.org/10.47191/ijsshr/v5-i1-30>

Van, T. N., & Thanh, H. N. (2021). The impacts of Mobile-Assisted Language Learning (MALL) on freshmen's vocabulary acquisition and their perspectives. *Advances in Social Science, Education and Humanities Research/Advances in Social Science, Education and Humanities Research*. <https://doi.org/10.2991/assehr.k.211224.027>

Wang, X., & Gunaban, M. G. B. (2023). Effectiveness of Mobile-Assisted Language learning in enhancing the English proficiency. *Journal of Contemporary Educational Research*, 7(11), 140-146. <https://doi.org/10.26689/jcer.v7i11.5588>

Yang, J. (2013). Mobile Assisted Language Learning: Review of the recent applications of emerging mobile technologies. *English Language Teaching*, 6(7). <https://doi.org/10.5539/elt.v6n7p19>

Zhang, J., & Zou, L. (2020). Alternative Lengthening of Telomeres is a Self-perpetuating Process in Alt- Associated PML Bodies. 81(5), 1027-1042. Doi: 10.1016/j.molcel.2020.12.030