



## Duolingo application towards students' English vocabulary mastery: A systematic literature review

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### ABSTRACT

Vocabulary plays a vital role in effective communication, academic success, and future opportunities, yet many students face difficulties in mastering a large number of words, understanding contextual usage, and pronouncing them correctly. With the rise of digital technology, language learning applications such as Duolingo have emerged as interactive and gamified tools that make vocabulary learning more engaging and accessible. This study aims to systematically review the studies on the effect or effectiveness of Duolingo in improving English vocabulary mastery among junior high school students through a systematic literature review. Using the PRISMA approach, twenty-four relevant experimental studies published between 2020 and 2025 were selected from databases such as Google Scholar and Semantic Scholar. The studies were analyzed descriptively to identify common patterns, methods, and outcomes related to the use of Duolingo in vocabulary instruction. The findings reveal that Duolingo consistently enhances students' vocabulary achievement, motivation, and participation due to its game-based features and flexible learning environment. However, several studies highlight limitations such as the absence of comparative analyses with other learning tools and the limited exploration of long-term retention. Overall, the results confirm Duolingo's potential as an effective supplementary tool for vocabulary learning, supporting educators in developing innovative and engaging English learning models. Further research is recommended to explore its integration into classroom settings and its impact on diverse learner groups.

### INTRODUCTION

Vocabulary in using English as a Foreign Language (EFL) is an important foundation because it is one of the main tools of a language and a solid understanding of vocabularies may bring of effective communication. More than just a means of communication, language vocabulary is also the key to accessing education, employment, and a wider range of social opportunities. When students expand their vocabulary, they have a better ability to understand lessons at school, follow instructions precisely, and express themselves clearly. In the world of work, a strong vocabulary allows access to better jobs and greater career opportunities. In addition, having a broad vocabulary also facilitates more active social participation and supports students in understanding various aspects of the culture and society around them. Students must have a large number of vocabularies in order to communicate effectively (Kholis & Aziz, 2020).

Vocabulary mastery at the junior high school level is crucial for supporting students' EFL proficiency. Recent reviews and empirical work emphasize that vocabulary instruction remains a foundational component of language learning and literacy development. (Zeng, 2025). The development of vocabulary is therefore central to foreign language learning and must be taught not only as word forms and meanings but also as use in context (Majid, 2024). Junior high students face several practical challenges in learning English vocabulary: first, they must cope with a large volume of new words and multiple meanings, which makes retention and productive use difficult (Azhra, 2024). In addition to breadth and meaning, accurate pronunciation presents another obstacle. Learners frequently report difficulty with English phonology, which reduces their willingness to speak and use vocabulary actively (AbdAlgane & Idris, 2020). To address these issues, studies recommend interaction-based and technology-enhanced approaches (for example, gamified quizzes, video- and social-media integration) together with practices that build self-regulated study habits and repeated use (Haque, 2024; Muslim, 2023).

In terms of helping media to handle these challenges, the use of technology in English vocabulary development has changed the landscape of language education, giving students access to tools and resources that help them expand their vocabulary. Through mobile applications, websites, and online learning platforms, students can access vocabulary cards, interactive exercises, word definitions, and pronunciations that help deepen their understanding of the English language. Gamification in learning vocabulary, where students can compete or achieve achievements in learning, also makes the learning process more interesting and interactive. What's more, technology allows students to study anytime and anywhere, increasing flexibility and accessibility in vocabulary learning. Students may refine their English abilities





in a more interesting, dynamic, and efficient manner with the help of these tools. Early research emphasized that mobile-assisted gamified applications such as Duolingo offer engaging environments that promote vocabulary acquisition through repetition, rewards, and adaptive feedback (Ajisoko, 2020; Irawan et al., 2020; Shortt et al., 2021).

Duolingo is one of the media available that can be utilized for EFL vocabulary learning because it offers a gamified, mobile-assisted platform that supports repeated exposure to lexical items and allows learners to engage in autonomous, interactive practice outside of the traditional classroom. Recent years have seen a growing body of research investigating the effectiveness of Duolingo as a digital learning tool for enhancing English vocabulary mastery among EFL learners. Early studies established that the app’s gamified design, featuring adaptive feedback, rewards, and repetition, creates a motivating environment that supports vocabulary retention (Ajisoko, 2020; Irawan et al., 2020; Shortt et al., 2021). Empirical evidence consistently shows that Duolingo improves learners’ vocabulary achievement across educational levels, from elementary to tertiary students (Abdul, 2019; Andini & Salmiah, 2024; Hernandijaya, 2020; Hidayat, 2025; Muddin, 2018; Paqui Gualán & Vivanco Loaiza, 2025). Wijaya (2024) conducted another library-review of 20 studies concluded that Duolingo promotes greater vocabulary learning enjoyment and leads to significant vocabulary knowledge gains among Indonesian EFL learners. A qualitative investigation further reported that students valued the app’s gamified features (e.g., XP, streaks, levels) for boosting motivation and improving passive vocabulary knowledge (word recognition and comprehension), though it noted that opportunities for productive use were limited (Alim et al., 2024).

These findings imply that when carefully integrated into EFL instruction, Duolingo can serve as an effective adjunct tool in vocabulary learning, particularly for receptive vocabulary, and that its motivational and engaging interface contributes to its efficacy. It should, however, be complemented by communicative and contextualized tasks to optimize active vocabulary use. Related to that previous analysis, in this study, the following research questions were sought: Research Question 1 (RQ1). What are the trends in the utilization of Duolingo Application towards Junior High School Students’ English Vocabulary English and Mastery? and Research Question 2 (RQ2). What were the main findings from the available literature?

### LITERATURE REVIEW

Vocabulary mastery is a crucial component of language competence and communication. Recent research emphasizes that vocabulary knowledge comprises both breadth (the number of words known) and depth (the quality of word knowledge), and that instruction targeting both aspects support comprehension and productive language use (Dickinson, 2019; Zeng, 2025). For junior high learners, vocabulary provides the foundation for the four language skills: listening, speaking, reading, and writing. Insufficient vocabulary limits learners’ ability to access and produce meaningful input and output (Putra, 2023; Rosyada, 2023). Students at this level commonly face practical challenges such as limited exposure to English outside the classroom, difficulty memorizing and retaining large word sets, and short attention spans, all of which reduce the effectiveness of one-off learning activities unless supported by repeated, contextualized practice.

In response to these challenges, digital applications such as Duolingo have become widely used as accessible and gamified tools for independent vocabulary practice. Duolingo’s game elements (levels, streaks, immediate feedback) and mobile accessibility can increase student engagement and, in many classroom studies, lead to measurable gains in vocabulary scores when used as a supplementary tool (Hia, 2024; Kurnianto, 2025). At the same time, researchers note recurring limitations: reliance on stable internet or device access, occasional unnatural sentence/translation output, limited pronunciation modelling for some items, and insufficient explicit grammar explanation. Duolingo works best when integrated with teacher guidance and supplementary activities rather than used as the sole instructional method (Pramesti & Susanti, 2020; Deris & Shukor, 2019).

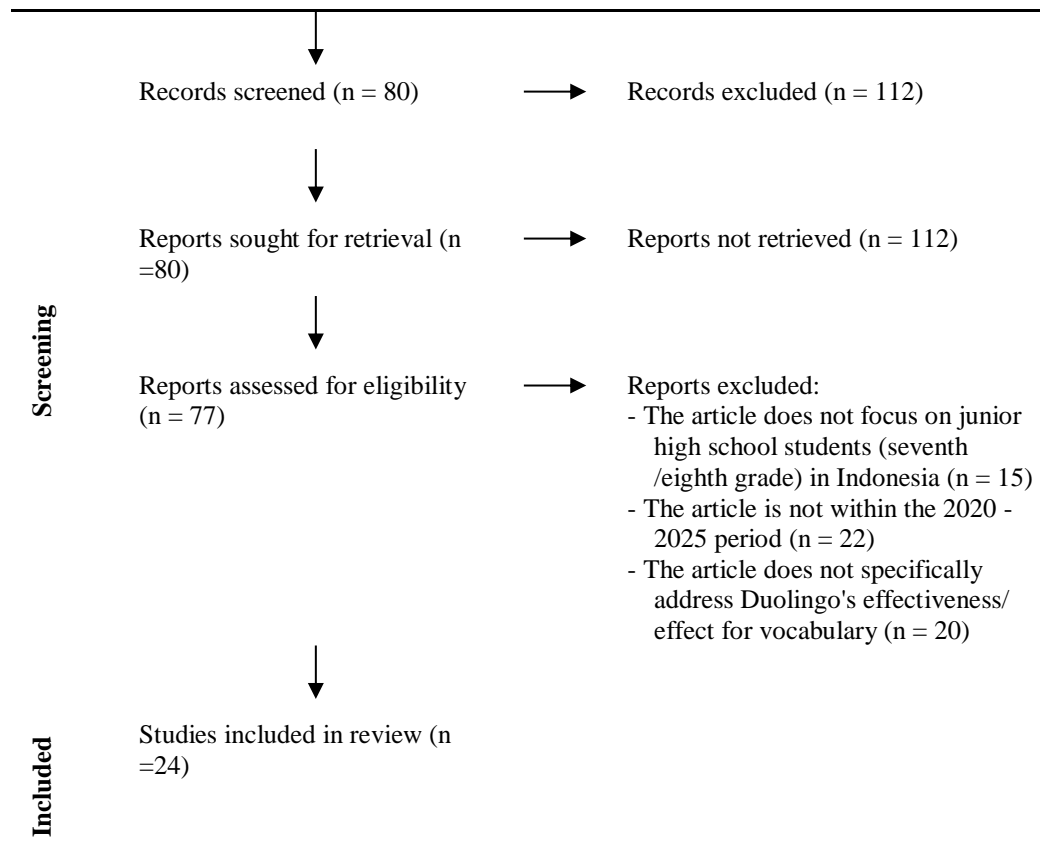
Several previous studies support the role of technology and gamification in vocabulary learning. Cindi et al. (2023) and Alfi et al. (2020) found that mobile-assisted and game-based learning increased motivation and vocabulary mastery. Shortt et al. (2021) reviewed eight years of Duolingo studies and concluded that the app positively influenced language performance, though methodological rigor varied. More recent studies by Fathimatuzzahra (2022) and Rouabhia (2024) highlight Duolingo’s interactive nature as a key factor in enhancing vocabulary acquisition.

### METHOD

This Systematic Literature Review (SLR) research is guided by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) method. It consists of four main phases: Identification, Screening, Eligibility and Inclusion.

Identification of studies via databases and registers	
<b>Identificat</b>	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>Records identified from:</p> <ul style="list-style-type: none"> <li>Google Scholar (n =137)</li> <li>Semantic Scholar (n = 29)</li> <li>Garuda (n = 21)</li> <li>Open Knowledge Maps (n = 5)</li> </ul> </div> <div style="width: 5%; text-align: center;">→</div> <div style="width: 45%;"> <p>Records removed before screening:</p> <ul style="list-style-type: none"> <li>- Duplicate records removed (n = 0)</li> <li>- Records marked as ineligible by automation tools (n = 0)</li> </ul> </div> </div>





### Criteria for Inclusion and Exclusion

This research used various data sources to find relevant literature, such as nationally and internationally accredited scientific journals and academic databases (Google Scholar, Semantic Scholar, Garuda, Open Knowledge Maps, etc.). Keywords used in the search included "Duolingo", "Duolingo application", "English vocabulary learning", "junior school students", "effectiveness", "seventh grade", and "eighth grade". The publication period sought was from 2020 to 2025. This publication window was chosen to ensure the relevance and currency of the findings in the context of recent educational trends. The selected period reflects the years during which digital learning tools, including Duolingo, gained prominence, especially following the shift toward online and blended learning methods as a response to the COVID-19 pandemic. This timeframe also allows the researcher to focus on studies that align with the most updated features of the Duolingo application and current teaching practices in junior high schools. By limiting the search to the last five years, the review ensures that the studies analyzed represent the most recent pedagogical and technological developments in vocabulary learning. An initial search was carried out using keywords in Google Scholar. Search results were then filtered based on title, abstract, and keywords to find the most relevant literature. Relevant articles were read thoroughly to understand the research methodology, findings, and conclusions. Relevant data from the articles were then recorded for use in subsequent analysis. This process was carried out systematically and was well documented to ensure that all relevant literature had been found and evaluated objectively.

### Data Analysis

All data that meet the inclusion criteria and have undergone a quality assessment are combined. Using descriptive techniques, researchers can effectively examine the data and provide a comprehensive overview that aligns with the research questions formulated at the outset. This analytical process allows the researchers to identify patterns, trends, and relationships within the data, ultimately leading to a deeper understanding of the research topic and the effectiveness of the Duolingo application in improving English vocabulary learning among junior high school students.

## RESULT

In response to RQ1, the subcategories examined by the researchers included the distribution of the studies by year, the distribution of the regions where the studies were conducted in Indonesia, research methods used and other parts of the articles.





**Trends in the utilization of Duolingo Application**

*Distribution of studies by years*

A total of 24 studies were reviewed for this research, spanning publications from 2020 to 2025. The distribution shows a gradual increase in scholarly attention over the years, with 3 studies published in 2020, 2 in 2021, and 3 in 2022.

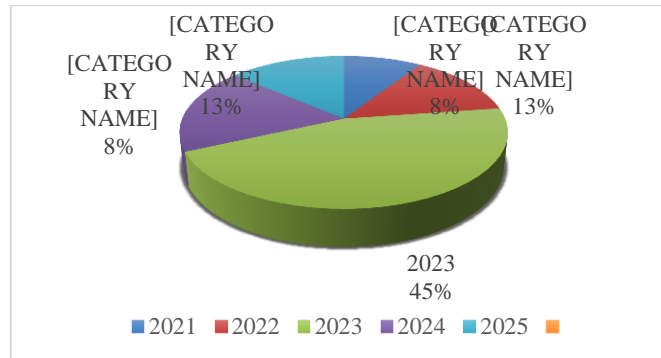


Chart 1. Number of Studies on Duolingo Application

A significant rise occurred in 2023, with 11 studies, indicating growing research interest in the topic during that year. However, the number slightly declined afterward, with 2 studies in 2024 and 3 studies in 2025. This trend suggests that while the peak of research activity occurred in 2023, the topic has continued to attract consistent attention in subsequent years.

**Regional Distribution Analysis**

All 24 studies were conducted in Indonesia, as evident from the journals (They are Sinta and Non Sinta indexed Indonesian journals). However, they can be grouped by major regions or islands based on author affiliations, journal scope, and school locations (as indicated in titles or articles)

Table 1. The Regional Distribution of Studies

Region / Island	Number of Studies	Example Studies
<b>Java</b>	8	Aulia et al. (2020); Yuwono (2022); Permatasari et al. (2022); Hernadijaya (2020); Aziz & Hoesny (2023); Mevia et al. (2024); Khawas & Agustina (2024); Ulfa et al. (2025)
<b>Sulawesi</b>	8	Abin, R., & Andas, N. H. (2022); Tsamratulaeni (2023); Megawati et al. (2023); Borang et al. (2023); Sakkir et al. (2023); Hardiyanti et al. (2021); Najwa Lahmady et al. (2023); Putri et al. (2025);
<b>Sumatra</b>	6	Kurniawati et al. (2021); Mahfuza & Zulfitri (2023); Fitri et al. (2023); Simanjuntak et al. (2023); Ningtyas & Reftyawati (2024); Andini & Salmiah (2024);
<b>Nusa Tenggara / Papua / Maluku</b>	2	Kurnianto (2023); Dinasti et al. (2025)

Java dominates due to high concentration of universities and schools involved in EFL research (esp. East Java & Central Java). Strong representation, especially in South Sulawesi, where universities and similar institutions are active in applied linguistics research. Sumatra which is the emerging region where studies mostly explore vocabulary mastery improvements and focus mainly on small-scale classroom experiments. Minimal but growing representation is supposed to be in Kalimantan, Nusa Tenggara, Papua and Maluku. In summary, Research on Duolingo for EFL vocabulary learning in Indonesia is widely distributed across regions, with Java and Sulawesi as major contributors. This reflects the concentration of teacher training institutions and active publication cultures in these regions.

**Research Questions and Theoretical Framework**

From the reviewed studies, although all the research questions are focused on the effect or the effectiveness of Duolingo in English vocabulary mastery, there are some differences between them. The first difference is in the grade and school level, with some studies focusing on students in Grade VII of junior high school, others in Grade VIII. The next difference lies in the aspects studied, namely vocabulary mastery, vocabulary performance and vocabulary competence. There are also differences in the approaches and methods used, namely Duolingo vs. Conventional, Duolingo & Autonomous Learning, and the Influence & Impact of Duolingo. Additionally, there are also differences in the ultimate goals of the study, namely improving vocabulary mastery, overcoming the problem of limited vocabulary,





increasing interest in learning, and demonstrating the effectiveness of Duolingo. In short, further reviews notified that the scope is limited to junior high school level and students, Duolingo Application, and English vocabulary mastery.

The studies were drawn from various theoretical foundations, including vocabulary learning theories, motivation theory, and media theory, to explore the underlying principles of vocabulary acquisition and the effectiveness of Duolingo in facilitating this process. Motivation theory plays an important role when it comes to understanding why someone is motivated to learn a language. Maslow's theory of the hierarchy of needs explains that the fulfilment of basic needs can be a motivation for learning. It also discusses the concepts of intrinsic and extrinsic motivation, both of which play a role in fostering a desire to learn. The theory of vocabulary acquisition and learning also emphasizes the importance of vocabulary mastery for language proficiency. Effective vocabulary learning strategies as emphasized by Richards and Nunan (1991) are also discussed. In addition, the text also emphasizes the role of technology in language learning using the CALL theory. Duolingo, as an example of a CALL application, is considered effective because it combines game-like elements that can increase motivation to learn.

### Research Methods Analysis

The methods of the reviewed studies can be classified into two types - Quantitative – Experimental / Quasi-Experimental and Quantitative – Pre-Experimental (One Group Pretest-Posttest) as it can be seen in Table 2. All studies reviewed in this research used quantitative methods, particularly pre or quasi-experimental designs, aiming to measure the effectiveness or effect of Duolingo in improving vocabulary mastery. These studies typically compare pre-test and post-test scores of the control and experimental groups to test Duolingo's effect on vocabulary mastery. The second one Focused on a single group to measure improvement after using Duolingo; suitable for classroom-based implementations.

Table 2. Methodological Procedures used in the Reviewed Studies

Research Method	Representative Studies
<b>Pre-Experimental</b>	Hardiyanti et al. (2021); Azzahara et al. (2022); Yuwono (2022); Borang et al. (2023); Abin, R., & Andas, N. H. (2022); Tsamratulaeni (2023); Megawati et al. (2023); Najwa Lahmady et al., (2023); Andini & Salmiah (2024); Khawas & Agustina (2024); Ulfa et al. (2025); Dinasti et al. (2025);
<b>Quasi Experimental</b>	Aulia et al. (2020); Hernadijaya, S. N (2020); Kurniawati et al. (2021); Ningtyas & Reftyawati (2024); Kurnianto (2023); Aziz & Hoesny (2023); Permatasari et al. (2022); Simanjuntak et al., (2023); Fitri et al. (2023); Mahfuza & Zulfitri (2023); Mevia et al. (2024); Putri et al. (2025)

Three types of research methods are used in the research methods from the reviewed journals, namely pre-experimental, quasi-experimental and true-experimental. The main difference between the three lies in the degree of control and validity. In the pre-experimental method with a pretest-posttest design with only one group, the changes are measured before and after the treatment. Quasi-experimental, with two groups (experimental and control), compares the effectiveness of the Duolingo application with a better control. Experimental/true-experimental, also with two groups, tests cause-effect relationships with strict control and randomization. The research at SMP Al Razi and the Omega Science Institute are examples of experimental and true-experimental studies, while other studies mostly use pre-experimental and quasi-experimental studies, each with their own advantages and disadvantages.

The research instruments in reviewed journals differ from each other. Although test instruments are common, their types and combinations vary. Types of tests used include multiple-choice tests, written tests, language proficiency tests (Duolingo application), vocabulary tests, and achievement tests. Some studies also use other instruments such as questionnaires, interviews, documentation, observation and assessments or combine several instruments. These differences indicate that each study has different objectives and data needs, so the research instrument chosen will be customized.

The research samples from reviewed journals differ from each other. This difference is evident in the variety of grade levels studied, with most studies using Class VII students, but some using Class VIII students and even all Class VII students in a school. The type of schools where the studies are conducted also varies: MTsN, SMPN and private junior high schools spread across different regions in Indonesia such as Aceh Besar, Belitung, Bandar Lampung and others. The number of samples in each study also varies, ranging from 18 to 112 students with different sampling methods, such as one class, two classes (experimental and control class), or students from an English club.

### Analysis and Result Part

Several studies have shown that using the Duolingo application generally improved students' mastery of English vocabulary. The striking commonality of these studies is the conclusion that Duolingo can be an effective tool for vocabulary learning. The interactive and fun learning methods offered by Duolingo can increase students' motivation to learn and help them better memorise new vocabulary. Differences were found in terms of the research design used, the sample size and the variables studied. Some studies used a pre-experimental design with one group, while others used a quasi-experimental design with two groups. In addition, the sample size varied in each study. However, the research





results showed a positive development towards the use of Duolingo in improving vocabulary mastery. Another interesting finding is that in one particular study, no significant difference was found between the experimental group using Duolingo and the control group. This suggests that the effectiveness of Duolingo may be influenced by other factors such as the duration of use, the intensity of the students' learning and the characteristics of the students themselves.

Although all the research results show that Duolingo is effective in improving English vocabulary, there are some differences between them. These differences include the research methodology (use of a control group versus a pre-experimental design, use of statistical analysis), the subjects (different grade levels and schools), the research focus (vocabulary acquisition versus general effects on English learning), and the research outcomes (significant vocabulary gains, non-significant differences in one study, additional outcomes such as student motivation). These differences point to the need for further research to investigate the effectiveness of Duolingo in different contexts and the factors that influence it.

Although all studies concluded that Duolingo was effective in improving English vocabulary, there were some differences between them. Some studies focused on improving general vocabulary knowledge, while others focused on improving vocabulary performance or mastery. Others examined the effects of Duolingo on learning motivation, vocabulary comprehension and compared it to traditional methods or other apps. There were also differences in the level of specificity, with some studies mentioning the grade level or the name of the school where the study was conducted. Most studies concluded that scores increased significantly after using Duolingo, but some also showed insignificant results. These differences suggest that the effectiveness of Duolingo may depend on factors such as the learning objectives, the characteristics of the students and the research method used. Some of the research limitations reviewed focused on Duolingo and vocabulary limitations, while others were more general. Some emphasised problems of generalizability, methodological details, and lack of explanation. Some studies explicitly stated that Duolingo was not compared with other methods or that factors such as motivation were taken into account. The topics and aims of the studies also varied.

### Conclusion Part

The reviewed research findings consistently demonstrate that Duolingo is a highly effective tool for improving English vocabulary, particularly among young learners. The majority of studies have shown significant increases in vocabulary scores among students who used Duolingo compared to those who did not. Key factors contributing to Duolingo's success include its gamification features, personalized learning approach, and accessibility. While one study encountered methodological limitations, the overall evidence strongly supports Duolingo's effectiveness as a valuable resource for enhancing English language skills. However, further research is necessary to fully understand its effectiveness in various contexts and with diverse student populations.

### DISCUSSION

Based on the analysis of various studies on the use of the Duolingo application in SMP (Junior High School) and MTs (Islamic Junior High School), it can be drawn that there are similarities and differences in the results obtained. In general, both types of schools show that Duolingo is effective in improving students' English vocabulary mastery. The majority of studies, both in SMP and MTs, use experimental methods such as pre-tests and post-tests, with some studies comparing experimental groups using Duolingo with control groups using conventional methods. The Duolingo application has been proven to improve the vocabulary mastery of junior high school students. Munday (2016) stated that Duolingo is preferred over regular tasks and media because of the convenience it offers, according to his research. This means that Duolingo is easy to use and more interesting. The application's design, which combines gamification, makes the learning process more fun and interactive, so that students are more motivated to continue learning.

Maslow's theory of the hierarchy of needs explains that the fulfilment of basic needs for self-actualization can be a motivation to learn. In addition, intrinsic (coming from within) and extrinsic (coming from outside) motivation also influence the spirit of learning. The concept of integrative and instrumental motivation offers further insight into the purpose of language learning. The theory of vocabulary acquisition and learning emphasizes the importance of vocabulary in mastering a language. These theories discuss various factors that influence vocabulary learning, such as learning strategies, frequency of use, and learning context. Researchers such as Richards and Nunan (1990) emphasize the importance of effective vocabulary learning strategies.

The main findings are also that Duolingo is able to improve student motivation, engagement, and vocabulary learning outcomes. Learning with the Duolingo application allows each student to learn at their own pace and learning style, so that self-confidence and motivation to learn can be increased. In addition, the daily practice features and instant feedback provided by the application are useful for improving understanding of new vocabulary and quickly identifying mistakes. Many exercises are provided, from multiple choice to speaking exercises, to help students develop a deeper understanding of how words are used in different contexts. Overall, these various features make the Duolingo application a very useful tool to expand the vocabulary of junior high school students. Similarly, Safrina et al. (2024) and Ta'amneh et al. (2024) found that the use of Duolingo significantly improved students' word recognition and usage





accuracy, supported by positive learner attitudes toward its interactive interface. Comparative and review studies (Rouabhia, 2024; Indrasari et al., 2024; Febrianti et al., 2024) have also highlighted Duolingo's potential as a complementary tool in EFL classrooms, emphasizing its role in expanding lexical input and promoting self-paced learning. Overall, evidence from both local and international research contexts supports the notion that Duolingo effectively combines gamification, feedback, and accessibility to strengthen vocabulary learning outcomes among EFL learners (Aziz & Hoesny, 2022; Purwanto et al., 2022; Rosyidah et al., 2023).

The role of Duolingo in language learning is also much discussed. This application is considered effective because it combines game elements (gamification) that can increase motivation to learn. In addition, Duolingo offers various functions that support independent learning. Studies show that Duolingo can increase learning motivation and vocabulary comprehension. General language learning theories such as CALL (Computer Assisted Language Learning) are also mentioned. According to Grimes (1977), CALL provides a platform for students to learn a new language independently and with minimal guidance from the teacher. This theory sees the potential of technology to support the language learning process. Duolingo, an example of a CALL application, offers flexibility and convenience to learners.

In terms of methodological aspect, there are some striking differences between the results of studies in SMP and MTs. Research in MTs refers more to theories of learning media and teacher innovation, while research in junior high schools often refers to theories of constructivism, gamification, and independent learning. Studies by Alim et al. (2025) and Selviana et al. (2025) further demonstrated that gamification elements in Duolingo foster motivation and learner engagement, which in turn enhance vocabulary retention. Overall, Duolingo has proven to be beneficial for both types of schools, although with slightly different emphases. In MTs, this application is used more as a simple tool to enrich basic vocabulary, while in junior high schools, Duolingo is also explored as a medium to increase student engagement and learning independence. Thus, it can be said that although the results are relatively the same in terms of vocabulary improvement, the context and research approach in junior high schools and MTs provide different nuances in the implementation and findings related to the use of Duolingo. In MTs, which are Islamic-based schools, studies tend to use smaller samples and apply more pre-experimental designs without a control group. For example, research at MTsN 2 Aceh Besar (Muhiddin, 2018) only involved 18 students and focused on improving basic vocabulary. Meanwhile, research in junior high schools is more diverse, with some studies using quasi-experimental designs and larger samples, such as research in SMP Al Razi Sinar Harapan (2023) involving 112 students. In addition, research in junior high schools emphasizes the impact of Duolingo on long-term learning motivation and independent learning, as seen in a study in SMPN 3 Buton Tengah (Abin & Andas, 2022) which links the use of Duolingo to an autonomous learning model. In Indonesian contexts, Duolingo has been proven to enrich learners' lexical competence by providing flexible, game-based learning experiences that support autonomous study (Anggraini et al., 2024; Nurhayati & Suryaman, 2024; Permatasari & Aryani, 2023; Wijaya, 2024).

Despite its benefits and strengths, it is important to remember that Duolingo is not an instant solution. Teachers can effectively integrate Duolingo into their English curriculum to improve vocabulary acquisition. By assigning specific Duolingo lessons or exercises, teachers can supplement traditional lessons and provide students with additional practice opportunities. In addition, teachers can encourage their students to use Duolingo independently to reinforce what they have learned outside of class. By monitoring student progress in the app, teachers can provide individualized feedback and support to ensure Duolingo is being used effectively and efficiently. In addition, teachers can organize classroom activities that connect Duolingo content to real-world language use, making the learning experience more meaningful and relevant. To maximize the benefits of Duolingo, students should use it consistently and supplement it with other learning resources, such as reading books, watching movies, or practicing with language exchange partners. When students combine Duolingo with these additional activities, they can significantly improve their vocabulary and overall language skills. For example, researchers could investigate how learners' motivation, language level and learning style affect the outcomes of using Duolingo.

## CONCLUSION

Several studies have examined the effectiveness of the Duolingo application in improving students' vocabulary, particularly at the junior high school level. Regionally, Java and Sulawesi dominate, indicating regional academic productivity and English education research focus on Duolingo Application. Methodologically, quantitative research (especially experimental) overwhelmingly dominates, showing a focus on measuring learning gains rather than exploring learning processes. Duolingo can be a valuable tool. Most studies showed positive results in which students using Duolingo made significant improvements in vocabulary scores after participating in the learning program. These studies generally used a single-group pre-experimental research design or a two- group (experimental and control) quasi-experimental research design. However, there were some differences in study design, sample size and methods of data analysis. Overall, these results suggest that Duolingo can be an effective tool to supplement language learning in the classroom and increase students' motivation to learn vocabulary. Future research could look more closely at the specific factors that influence the effectiveness of Duolingo for different learner groups. It would also be beneficial to investigate the long-term effects of using Duolingo on language proficiency. By conducting longitudinal studies, researchers can assess whether the progress made through Duolingo is maintained over time. In addition, future





research could investigate the effectiveness of combining Duolingo with other language learning technologies or methods to create hybrid learning approaches. Qualitative exploration (e.g., teacher/student perceptions, motivation, or engagement), is also suggested as a potential research gap for future studies to address affective and process-oriented dimensions of Duolingo use.

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#### APPENDIX: LIST OF THE REVIEWED STUDIES

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