

## **GAMIFIED VOCABULARY LEARNING WITH DUOLINGO: EFL STUDENTS' PERCEIVED BENEFITS, CHALLENGES, AND RESPONSES**

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### **ABSTRACT**

The use of technology in language learning has increased due to the innovation of education in this digital era. One form of technology-based language learning is the use of mobile application, such as Duolingo. While the majority of previous studies have employed a quantitative approach, this study aims to explore secondary EFL students' perspectives on (1) the benefits of using Duolingo in vocabulary learning, (2) the challenges they face during its use, and (3) their responses to the application. This qualitative descriptive case study involved classroom observation and interviews with eight junior high school students in Karawang. The data analyzed using thematic analysis. The results of this study reveal three main themes. First, students experienced several benefits from using Duolingo, including improved vocabulary acquisition, contextualized vocabulary exposure, multimodal learning features, ease of access, and flexibility. Second, students encountered obstacles, such as limitations in the free version of the app and unstable internet connectivity. Third, students expressed various emotional and motivational responses to using Duolingo, describing it as a joyful, relaxed, and motivating experience, although some noted boredom due to repetitive tasks. Overall, Duolingo was perceived as a helpful and engaging tool for vocabulary learning, aiding students' vocabulary development and motivation

*Keywords:* Duolingo, EFL Secondary Students, Mobile Learning, Technology, Vocabulary

### **A. INTRODUCTION**

English serves as a global lingua franca, underscoring its critical importance for proficiency in various domains (Callies et al., 2021; Crystal, 2003; Erk & Ručević, 2021). Mastery of English facilitates broader access to information and knowledge resources (Rao, 2019) and opens pathways for pursuing international educational opportunities (Agustina et al., 2024; Daqiq et al., 2024). A fundamental aspect of English language acquisition is vocabulary development, which forms the cornerstone of competencies in reading, writing, listening, and speaking (Richards, 2002). Insufficient vocabulary knowledge can hinder the enhancement of one language abilities. Research indicates that a minimum vocabulary

knowledge of 2,000 to 3,000 words is necessary for effective daily communication (Schmitt & Schmitt, 2020). Nevertheless, students frequently perceive English as a challenging subject due to complex grammatical structures and difficulties in pronouncing and articulating vocabulary, which complicates its practical application in everyday contexts (Dağgöl, 2020).

Given the prevalent engagement of Generation Z students with digital devices, integrating technology into education can enhance their interest in learning. Technology serves as a valuable tool to support and enrich the learning experience. Moreover, with the implementation of the Merdeka curriculum, educators are encouraged to adopt innovative and engaging teaching strategies, leveraging contemporary technological advancements to optimize the efficacy of the learning process (Senatama, 2023). Numerous educational institutions in Indonesia have embraced technology as a pedagogical tool to enhance student learning outcomes (Rabani et al., 2023; Widodo & Akbar, 2024).

### **1. Technology-based Language Learning**

Warschauer & Liaw (2010) define digital language learning as the use of technologies in learning language acquisition such as mobile devices to give interactive and flexible learning environment. They stated that it is crucial for vocabulary acquisition in English for Foreign Language (EFL) context because digital platform and mobile apps can support productive use. The important elements offered by mobile learning include authentic, context-based, and up-to-date learning materials (Traxler & Kukulska-Hulme, 2007). Mobile devices are almost always close to the user, making it possible to access learning spontaneously and making learners more exposed to learning materials due to their practicality and can be the tool to improving language learning education both formal and informal way (Ally, 2009; Warschauer & Liaw, 2010).

Mobile learning technologies support a rich multimedia content. Specifically, for language learning, mobile devices can support language tools like text, audio, image, and video. This combination of visual, auditory, gestural is called multimodality (Traxler & Kukulska-Hulme, 2007; Mayer, 2020; Warschauer & Liaw, 2010). The combination of various aspects has been widely used in education.

In the realm of language education, modern technology encompasses a diverse array of resources, including the internet, applications, digital dictionaries, and e-books, all of which are readily accessible in digital formats (Nugroho et al., 2022). A variety of applications designed for English language learning have been developed, catering to learners from beginner to advanced levels with user-friendly interfaces (Almousawi, 2021; Lim & Toh, 2024). Among these, Duolingo stands out as a prominent language-learning application due to its innovative platform that delivers comprehensive English vocabulary learning instruction in an effective and engaging manner. The platform incorporates contemporary language-learning methodologies to enhance comprehension and enjoyment (Freeman et al., 2023), thereby fostering a more interactive and pleasurable learning experience for students (Maru et al., 2024). Additionally, Duolingo provides users with performance metrics, including points earned, learning streaks, and time invested, to track progress and encourage sustained engagement.

## **2. Duolingo Application in Language Learning**

Duolingo is a technology-based language learning application developed by Luis von Ahn and Severin Hacker. In 2025, it has been downloaded by more than 500 million users on the Google Play Store and has been included in the Editor's Choice category. The learning is designed with a fun gamification method. Gamification aspect in Duolingo can help increase students' engagement. It helps student learn with fun learning experience (Kapp, 2012). The material is presented in small portions. The content is adjusted to global teaching standards to prepare students for practical communication (Freeman et al., 2023). It is explained that Duolingo is not limited to teaching only one language skill but all aspects of the language so that it provides a language learning experience with a variety of focus abilities (Freeman et al., 2023).

Numerous studies have examined the effectiveness of Duolingo applications in English language learning. Apoko et al. (2023) demonstrated that the Duolingo application significantly enhances EFL students' vocabulary mastery. Similarly, Nita et al. (2023) explored the millennial generation's experiences with Duolingo, finding that it promotes longer study sessions and offers flexible learning opportunities. Additionally, Ningtyas & Reftyawati (2024) concluded that Duolingo aids students in acquiring and mastering new vocabulary. Maru et al. (2024) focused on students' perceptions of Duolingo as a vocabulary learning tool, while Fitriani & Modokompit (2025) investigated its role in improving overall English proficiency. Despite the growing body of research on the use of Duolingo as a mobile-assisted language learning, limited studies have explored junior high school students' perspectives on using Duolingo specifically for vocabulary development in the context of the Merdeka curriculum. This study aims to explore the perceptions of EFL junior high school students regarding the benefits of using Duolingo for English vocabulary learning, the obstacles encountered during its use, and their emotional and motivational responses toward the application.

## **B. METHOD**

This study employed a qualitative descriptive-case study research design to investigate students' experiences following the use of the Duolingo application for vocabulary learning. As outlined by Creswell & Creswell (2018), qualitative research involves an inquiry process aimed at understanding social or human issues by constructing a comprehensive, holistic depiction through detailed, word-based reports of informants' perspectives, conducted within a natural context. Golby (2001) describes a case study as an in-depth analysis of an event or series of related events that the researcher believes exemplifies certain identified theoretical principles. Data for this study were gathered through classroom observations and semi-structured interviews. The research was conducted at a junior high school in Karawang, selected due to the observed low vocabulary proficiency among students, which hindered their ability to communicate effectively in English. Participants were eighth-grade students from two classes, Class B and Class C.

The researcher examined the vocabulary learning process facilitated by the Duolingo application, utilizing prepared observation notes as a framework for monitoring learning activities. Observation allows the author to obtain firsthand information by directly observing individuals in their natural environments, which is especially useful for analyzing genuine behavior (Creswell, 2021). Face-to-face interviews were conducted with eight students who already participated in activities aligned with the research focus in the class. The researcher employed semi-structured interview questions centered on the utilization of

the Duolingo application as a tool for learning English vocabulary and the students' responses to these activities. Classroom observations and semi-structured interviews are commonly acknowledged as effective methods for data collection in qualitative research, especially within educational contexts (Creswell, 2021; Creswell & Creswell, 2018)

The collected data then analyzed with (Braun & Clarke, 2022) six-step thematic analysis to examine students' perceptions of the learning application. The process began with data familiarization through repeated engagement with interview transcripts, followed by generating initial codes to identify meaningful patterns. These codes were then organized into potential themes, which were reviewed and refined to ensure coherence with the dataset. The themes were subsequently defined and named to capture their essence, before producing the final analysis through a written narrative that integrated participant quotes with thematic interpretations. This systematic approach ensured a rigorous and transparent analysis of qualitative data while maintaining focus on participants' experiences.

## C. FINDINGS AND DISCUSSION

Based on the thematic analysis of interview transcripts and classroom observations, three major themes emerged: (1) the benefits of using Duolingo for vocabulary learning, (2) the obstacles encountered during its use, and (3) students' responses and motivation toward the Duolingo learning experience. These themes are presented and discussed in the following subsections.

### 1. Benefits of Learning Vocabulary Using Duolingo

The findings revealed several benefits of using Duolingo in vocabulary learning. Students expressed positive experiences in acquiring new vocabulary more easily and meaningfully through the platform. The benefits discussed in this section include: help in vocabulary acquisition, contextualized vocabulary, level unit system, language skill features (multimodality), and easy access and flexibility.

#### Help in vocabulary acquisition

The findings indicate that utilizing Duolingo as a media for vocabulary learning significantly enhances students' vocabulary acquisition. As articulated by P5 and P4:

*"It really supports me in increasing my vocabulary. Like for example when I want to talk about eating or anything, I had no idea, then I remembered oh yeah there was a lesson in Duolingo for that word, then I immediately remembered it." (P5, 8C)*

*"Yes, it has a big impact on me. I also used Duolingo for the first time when it was introduced to me in class, then I practiced it during class hours, I already memorized some vocabulary after that." (P4, 8B)*

The interview results suggest that participants' vocabulary has improved after using Duolingo. This finding aligns with the research by Fitriani & Modokompit (2025) which reported positive feedback from interviewees who noted an increase in their vocabulary, as well as with the studies by Ajisoko (2020) and Ningtyas & Reftyawati (2024), which demonstrated higher scores in the post-test results of the control class.

### **Contextualized vocabulary**

Participants in this study indicated that the vocabulary offered by Duolingo is highly comprehensible and applicable to daily life. As expressed by the participants:

*“ ... in fact, sometimes I don't often see the vocabulary in everyday life, while in Duolingo there are mostly common vocabulary.” (P2, 8B)*

*"For me, the experience is fun, it's nice to be able to learn in a relaxed way and the vocabulary is also useful in daily life. It's easy to understand and not difficult." (P3, 8B)*

The contextualized vocabularies presented in Duolingo make it easier for students to understand the meaning of the words and when to use it in their daily life. This finding is consistent with the results of prior research conducted by Maru et al. (2024) and Nita et al. (2023), which demonstrated that Duolingo delivers practical and contextualized vocabulary. This vocabulary context relevance enhances their engagement in both academic and non-academic activities. The vocabulary acquired through Duolingo aligns well with the curriculum taught in schools and facilitates effective communication in everyday situations. Additionally, these words, which can be relevant in many situations, are referred to as high-frequency vocabulary. Therefore, possessing a word list that features high-frequency vocabulary is advantageous, as it represents the language an average person encounters on a daily basis and emphasizes the words that are frequently used in different contexts (Schmitt & Schmitt, 2020).

### **Level unit system**

Furthermore, there is a level or unit system that enables students to begin their learning journey from the lowest level, help students to learn from basic. This approach assists students in learning in accordance with their respective ability levels. As expressed by one participant:

*“The problem is that sometimes in a textbook I don't really understand, because there are vocabulary words that are not basic, so I'm like what is this, for example in Duolingo it is gradual from the basic.” (P6, 8C)*

The gradual level system with AI-powered personalization learning in Duolingo can be very helpful because it is generating lessons that adjusts to students' specific progress and needs. Acknowledging the uniqueness of each learner, it utilizes techniques grounded in learning science to modify lesson difficulty, helping students enhance their skills in the areas that require the most attention (Freeman et al., 2023).

### **Language skills features**

The Duolingo application offers a diverse array of features that facilitate vocabulary acquisition through various media. Several of these features support students in learning vocabulary through multiple methods, including spelling, which aids in the accurate spelling of words; listening, which familiarizes students with the correct pronunciation; speaking, which allows students to practice their pronunciation; and pairing/matching, which enables students to assess their knowledge. All of these elements are presented in the format of an interactive and relatively repetitive quiz game. Several participants emphasized:

*"... we can just talk to the app, then we can also type words in English correctly, the correct spelling." (P6, 8C)*

*"I can practice listening and speaking as well. Moreover, I like listening and speaking English the most. There I can gain and memorize vocabulary to improve my speaking skills because there are voice recordings too, so I can check if I'm right or wrong. (P1, 8B)*

*"Duolingo makes learning English vocabulary interactive and fun through quiz games and exercises." (P8, 8C).*

Duolingo's diverse language features effectively engage students. These features are appealing to learners and cater to their individual learning preferences. The integration of visual, auditory, and gestural elements is referred to as multimodality ((Traxler & Kukulska-Hulme, 2007; Mayer, 2020; Warschauer & Liaw, 2010). In the context of mobile learning, multimodality offers a variety of learning dimensions. These various language features are advantageous for learners, as vocabulary cannot be separated from the four language aspects identified by Nation and Nation (2001) and Schmitt & Schmitt (2020), which align with the previous studies conducted by Fitriani & Modokompit (2025) and Nita et al. (2023).

### **Easy to access and flexible**

Accessibility and flexibility are crucial factors in delivering a practical learning experience. This flexibility encourages students to maintain their interest in learning at various times, such as during intervals after school. Vocabulary learning activities can be conducted anytime and anywhere. Students reported that they have become more routine in their English vocabulary learning, as the ease of access and flexibility provides them with a sense of comfort in this digital age. The following are student statement:

*"Yes, it helps, so if I want to learn vocabulary again, I can do it anytime, just open my phone and click on the application." (P4, 8B)*

*"It's really helpful for those of us who are just playing with our phones so we can learn English on our phones. Yes, became more routine." (P6, 8C)*

The ease of access provided by Duolingo, a mobile-based language learning platform, allows students to learn anytime and anywhere. This convenience encourages students to engage in more regular vocabulary learning. Mobile devices create an interactive and flexible learning environment, which is crucial for vocabulary acquisition in the English as a Foreign Language (EFL) context, as digital platforms and mobile applications can support productive use (Traxler & Kukulska-Hulme, 2007; Warschauer & Liaw, 2010). This finding aligns with previous studies that demonstrate how the flexibility of access and ease of use of Duolingo play a vital role in delivering a practical and engaging learning experience. Students can learn at their convenience, including during breaks after school, which helps sustain their interest and motivation to learn (Apoko et al., 2023; Nita et al., 2023).

## **2. Obstacles of Learning Vocabulary Using Duolingo**

Despite its benefits, several obstacles surfaced in the learning process when using the Duolingo application, including the limitations of features available on the free account version and the issues associated with unstable internet connectivity.

### **Limited features on free account**

Firstly, one of the obstacles is that the premium features of Duolingo provide access to a variety of advanced functionalities, including a video call feature with the character Lily. This feature allows students to engage in interactive practice with the character. As a result, the lack of access to these premium features may pose a significant challenge for learners who are motivated and committed to their language acquisition.

*"However, for me personally, what makes me feel a bit burdened is because the advanced features have to be paid for, they have to be premium, so if you really want this opportunity to be bigger, it has to be premium. If it's not premium, the features are limited. For example, heart feature, if we make a mistake, it takes a long time before we can fill it up again." (P5, 8C)*

The "lives" or "hearts" feature, which is a component of gamification, can inhibit learning if students make too many mistakes while answering questions. This mechanism prevents students from continuing their learning until they wait for their lives to be replenished (Freeman et al., 2023). It limits the number of mistakes students can make; when their lives run out, they cannot continue playing and must wait for a considerable amount of time for their lives to refill. This creates pressure on students during the learning process, which has the potential to hinder optimal learning. Observations have shown that several students' learning processes came to a halt because they ran out of "hearts," leaving them to sit quietly and watch their classmates instead.

### **Disrupted internet connection**

Secondly, students also conveyed several obstacles that emerged during vocabulary learning using Duolingo. As P2 8B stated:

*"Only when the internet is a bit slow, I'm quite disturbed." (P2, 8B)*

Similar to P2's statement, P5 added:

*"Yes. When I was playing, the connection was bad and I was running out of quota, so when I finished it, it doesn't saved I and had to repeat it many times, so I was like, never mind." (P5, 8C)*

P2's and P5's statements indicate that unstable internet connections can significantly disrupt the learning process. Such disruptions can delay learning activities, as practice cannot continue without a stable internet connection. Classroom observations support this finding, revealing that students became confused when they could not continue the game, prompting some to call the teacher for assistance.

When the internet connection is unstable or disconnected, learning comes to a standstill. This finding aligns with a study by Maru et al. (2024), which showed that 56% of respondents strongly agree that it is difficult to access Duolingo without an internet connection. Additionally, Traxler and Kukulska-Hulme (2007) explain that mobile-assisted language learning requires an internet connection, and any issues with connectivity may hinder the learning process.

### 3. Student's Responses of Vocabulary Learning Using Duolingo

The implementation of the Duolingo application has led students to report a range of emotional and motivational reactions to their experience, characterizing it as joyful and motivating. However, some participants also mentioned feeling bored at times due to the repetitive nature of certain tasks.

#### Joyful learning experience

The implementation of Duolingo in the classroom was generally met with positive responses from the students. Many students perceived the learning process as fun, enjoyable, and a relaxed experience. The game-like features help reduce their learning pressure. As one of the participants stated:

*"I feel happy, I don't feel nervous when learning, it's really fun, especially learning using my phone. So I'm not afraid of mistakes or embarrassment because no one knows, so I'm at ease, hehe. (P4, 8B)"*

Similarly, P8 from the other class expressed his experience below:

*"My experience when using Duolingo is that I am very happy because the games are very unique, the learning is very easy, it is easy to understand the language too, because I'm also using Duolingo for the first time and it is very fun." (P8, 8C)*

Students find the learning experience enjoyable and more relaxed compared to traditional methods, which increases their enthusiasm for learning. The gamification aspect provides enjoyment to learners by offering preferences and challenges (Kapp, 2012). This finding aligns with the results of previous studies (Fitriani & Modokompit, 2025; Nita et al., 2023).

#### Boring repetitive question

Despite the positive experiences, one participant admitted that she sometimes felt bored because the questions appeared repeatedly. Her statement reads:

*"I'm really happy because it's like a little bit funny and fun but sometimes I just feel like boring and like have no motivation." (P5, 8C)*

Similar to P5, P6 also stated the same responses.

*"At first I felt bored because the questions kept repeating over and over again, ...". (P6, 8C)*

The participant's response above indicated that the repeated appearance of questions made them feel bored. This findings in contrast with the recent study by Fitriani & Modokompit (2025) which indicated a motivated feeling by the repetition because it is challenged them. Moreover, Nazari & Riazi (2024) explained that repetition is part of incidental learning and has strong potential in supporting vocabulary acquisition. Nevertheless, this feeling of boredom can be reduced by considering the quality of the repetition of questions, as also suggested by them in the book.



### **Motivates students to learn vocabulary**

Based on the interview data obtained, learning activities using Duolingo has positive results for the students. These include facilitating the acquisition and memorization of new vocabulary, making learning more enjoyable and engaging, and fostering a sense of motivation and challenge. A statement from the results of the interviews with students reads:

*"It's like really playing a game, for example, after finishing one mission is like, ouch, one more I'm already leveling up, finally finishing another mission. Moreover, there are ranks, so we feel like wow, I can be in first position, so I'm become motivated." (P5, 8C)*

P5's statement highlights the gamification aspects of Duolingo that can motivate students to learn vocabulary, such as the leveling feature, daily streak missions, and rankings. These elements encourage students to be more active and challenged in improving their skills. This type of learning experience is fun and engaging and this statement shared by almost all participants and other students. This aligns with the observation results, where students remained enthusiastic about practicing until they completed several units. This excitement is further supported by P7 (8C)'s statement, which states:

*"Well, Duolingo has a system like playing a game, so because of that I feel challenged to answer the questions. (P7, 8C)"*

Students are motivated by the game-like learning experience. The game-based learning system and game elements in Duolingo, including the daily streak and ranking features, provide a positive challenge for students. Gamification can present challenges that increase student engagement (Kapp, 2012) and motivate them to make continuous learning choices. This is in line with previous studies, which showed that the gamification aspects implemented in Duolingo, such as leveling features, daily streak missions, and rankings, provide motivating challenges that encourage students to remain active and consistently improve their vocabulary skills (Fitriani & Modokompit, 2025; Maru et al., 2024; Nita et al., 2023).

### **Motivates students to continue learning**

The last finding showed that several students expressed a strong willingness to continue learning vocabulary with Duolingo. This enthusiasm is influenced by the ease and joyful experiences they encounter while using the application. One of the participants conveyed:

*"I will continue because I like it. It's also fun and not difficult." (P1, 8B)*

Aligning with P1's answer, another participant also expressed a similar thing:

*"Definitely continue. The problem is that sometimes in a textbook I don't really understand, because there are vocabulary words that are not basic, ... " (P6, 8C)*

Students statements suggested that they might have a tendency to discontinue their learning when they find it boring or encounter challenges. Duolingo counters this by using gamification strategies that enhance learner engagement (Kapp, 2012), motivating users to revisit the app and dedicate enough time to the learning content (Freeman et al., 2023). As a

results, it leads to a continuous learning decision and it showed on the students' interview responses above.

#### D. CONCLUSION

The objective of this study is to explore secondary EFL students' perspectives on the use of the Duolingo application for vocabulary learning, focusing on the benefits, obstacles, and students' responses to it. This study has revealed three key findings regarding EFL students' vocabulary learning using the Duolingo application. First, Duolingo serves as an effective and accessible tool that enhances students' vocabulary acquisition through contextualized content, gamified features, and multimodal learning activities. Second, despite its benefits, students encountered several challenges, including limited features in the free version, unstable internet connectivity, and restrictions from the "heart" system. Third, students responded positively to the use of Duolingo, describing the learning experience as enjoyable, motivating, and flexible, though some expressed boredom due to repetitive tasks.

These findings highlight Duolingo's potential as a valuable resource for vocabulary acquisition among EFL students. Its engaging platform not only motivates learners but also encourages consistent vocabulary practice. However, the challenges identified emphasize the need for educators to consider these factors when integrating technology into language instruction. To maximize the benefits of Duolingo in classroom activities, educators should explore strategies to address these challenges and enhance the overall learning experience. The study suggests practical implications for vocabulary instruction. Educators may integrate Duolingo into English classrooms to support vocabulary acquisition. Furthermore, leveraging technology, such as Duolingo, can foster creative and engaging learning experiences, increase student participation, and encourage consistent learning habits. Future research should consider optimizing data collection timing, as this study was constrained to a two-week period due to school holidays and examination schedules. Additionally, while this study focused on general English vocabulary learning, future research should consider exploring integrating Duolingo with specific pedagogical approaches, such as deep learning, to enhance educational outcomes.

#### E. REFERENCES

- Agustina, V., Thamrin, N. R., & Oktoma, E. (2024). The Role of English Language Proficiency in the Global Economy and Business Communication. *International Journal Administration, Business & Organization*, 5(4), 82–90. <https://doi.org/10.61242/ijabo.24.423>
- Ajisoko, P. (2020). The use of Duolingo apps to improve English vocabulary learning. *International Journal of Emerging Technologies in Learning (iJET)*, 15(7), 149-155. <https://doi.org/10.3991/IJET.V15I07.13229>
- Ally, M. (Ed.). (2009). *Mobile learning: Transforming the delivery of education and training*. Athabasca University Press.
- Almousawi, S. A. (2021). Examining English Language Learning Apps from a Second Language Acquisition Perspective. *International Journal of Higher Education*, 10(5), 166-182. <https://doi.org/10.5430/ijhe.v10n5p166>
- Apoko, T. W., Dunggio, A. A., & Chong, S. L. (2023). The Students' Perceptions on the Use of Mobile-Assisted Language Learning Through Duolingo in Improving Vocabulary Mastery at The Teritary Level. *English Review: Journal of English Education*, 11(1). 17-26. <https://doi.org/10.25134/erjee.v11i1.7069>

- Braun, V., & Clarke, V. (2022). *Thematic Analysis: A practical guide to understanding and doing*.
- Callies, M., Hehner, S., Meer, P., & Westphal, M. (2021). Globalising Teaching English as an International Language. In *Glocalising Teaching English as an International Language*. <https://doi.org/10.4324/9781003090106>
- Creswell, J. W. (2021). *Educational Research: Planning, Conducting, and Evaluating Quantitative and Qualitative Research, Ebook, Global Edition*. Pearson Education.
- Creswell, W. J., & Creswell, J. D. (2018). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*. Sage.
- Crystal, D. (2003). *English as a global language*. Cambridge university press.
- Dağgöl, G. D. (2020). Perceived academic motivation and learner empowerment levels of EFL students in Turkish context. *Participatory Educational Research*, 7(3), 21-37. <https://doi.org/10.17275/per.20.33.7.3>
- Daiq, B., Akramy, S. A., & Barati, A. M. (2024). The Impacts of English Language Proficiency on Employment Opportunities. *American Journal of Science Education Research*. <https://doi.org/10.47991/2835-6764/AJSER-183>
- Erk, M., & Ručević, S. (2021). Early English language acquisition: how early is early enough? *Suvremena Lingvistika*, 47(92). <https://doi.org/10.22210/suvlin.2021.092.02>
- Fitriani, & Modokompit, G. P. (2025). The Effect of Duolingo Application in Improving Students' English Skills: A Research of Grade X Students at SMKN 3 Baubau. *Journal of English Language Teaching and Literature (JELITA)*, 6(1), 2721–1916.
- Freeman, C., Kittredge, A., Wilson, H., & Pajak, B. (2023). The Duolingo method for app-based teaching and learning. *Duolingo Research Report*.
- Golby, M. (2001). Case study method: key issues, key texts. *Teacher Development*, 5(3), 403-408. <https://doi.org/10.1080/13664530100200295>
- Kapp, K. M. (2012). *The gamification of learning and instruction: game-based methods and strategies for training and education*. John Wiley & Sons.
- Lim, F. V., & Toh, W. (2024). Apps for English Language Learning: A Systematic Review. In *Teaching English with Technology* (Vol. 24, Issue 1). <https://doi.org/10.56297/FSYB3031/GAQR3589>
- Maru, G., Kilmas, F., & Rombepajung, P. A. (2024). Students' Perception of Using Duolingo as a Media for Learning Vocabulary Article History. *SoCul: International Journal of Research in Social Cultural Issues*, 4(1), 1-12.
- Mayer, R. (2020). Multimedia Learning. In *Multimedia Learning*. <https://doi.org/10.1017/9781316941355>
- Nation, I. S., & Nation, I. S. P. (2001). *Learning vocabulary in another language* (Vol. 10, pp. 126-132). Cambridge: Cambridge university press.
- Nazari, N. A., & Riazi, A. M. (2024). *Adaptable English Language Teaching*. Routledge.
- Ningtyas, D. A. P., & Reftyawati, D. (2024). Teaching Vocabulary Using the Duolingo Application in Junior High School. *Fonologi: Jurnal Ilmuan Bahasa Dan Sastra Inggris*, 2(3), 310–324. <https://doi.org/10.61132/fonologi.v2i3.960>
- Nita, S., Sari, E. R. N., Sussolaikah, K., & Risky, S. M. F. (2023). The Implementation of Duolingo Application to Enhance English Learning for Millennials. *Journal International of Lingua and Technology*, 2(1), 1-9. <https://doi.org/10.55849/jiltech.v2i1.215>
- Nugroho, A., Van, D. T. H., Putra, H. R., & Nanda, G. A. (2022). To What Extent Does Informal Digital Learning of English Contribute to Learners' Communicative Competence?. *Tadris: Jurnal Keguruan dan Ilmu Tarbiyah*, 7(2), 409-422. <https://doi.org/10.24042/tadris.v7i2.13500>

- Rabani, S., Khairat, A., Guilin, X., & Jiao, D. (2023). The role of technology in Indonesian education at present. *Journal of Computer Science Advancements*, 1(2), 85-91. <https://doi.org/10.55849/jsca.v1i1.403>
- Rao, P. S. (2019). The importance of English in the modern era. *Asian Journal of Multidimensional Research (AJMR)*, 8(1), 7-19. <https://doi.org/10.5958/2278-4853.2019.00001.6>
- Richards, J. C. (2002). Theories of teaching in language learning. *Methodology in Language Teaching : An Anthology of Current Practice*, 19, 25.
- Schmitt, N., & Schmitt, D. (2020). *Vocabulary in language teaching*. Cambridge university press.
- Senatama, G., & Kartono, D. T. (2023). Investigating freedom to learn program as a form of education decentralization in Indonesia. *Ittishal Educational Research Journal*, 4(2), 55-65. <https://doi.org/10.51425/ierj.v4i2.44>
- Traxler, J., & Kukulska-Hulme, A. (Eds.). (2007). *Mobile learning: A handbook for educators and trainers*. Routledge.
- Warschauer, M., & Liaw, M. L. (2010). Emerging Technologies in Adult Literacy and Language Education. *National Institute for Literacy*.
- Widodo, Y. B., & Akbar, K. F. (2024). Effectiveness of Technology Use in Indonesian High Schools: Student Engagement, School Capacity, Teacher Performance. *International Journal of Business, Law, and Education*, 5(1), 615-627. <https://doi.org/10.56442/ijble.v5i1.442>