

CHAPTER 2

LITERATURE REVIEW

This chapter presents an in-depth explanation of the theories utilized for the study. The theories related to Duolingo as a MALL, vocabulary mastery, and the study of relevant research.

A. Theoretical Framework

1. Mobile-Assisted Language Learning (MALL)

Technology is essential in language learning because it helps boost students' interest and involvement. Supriyono et al. (2020) noted that technology plays a crucial role in regulating learners' affective engagement by maintaining their interest and enthusiasm, fostering open-mindedness, and encouraging active involvement in English learning. This important role of technology in learning is reflected in the concept of Mobile Assisted Language Learning (MALL). According to Çakmak (2019), MALL is a web, telecommunication, and mobile device technology for pursuing language learning that can be done anytime and anywhere, and is improving. In addition, Puebla et al. (2022) MALL is mobile-based learning that allows students to do self-directed learning by adjusting the pace and content to their needs. These perspectives show that MALL not only improves flexibility and accessibility but also positively influences students' motivation and emotional connection to the learning process.

MALL is closely related to the use of mobile devices to learn English, both inside and outside the classroom. Kamasak et al. (2021) stated that MALL is language learning facilitated by types of mobile devices, e.g., mobile phones, tablets, or iPads, with self-paced learning. Moreover, Fuady and Sadikin (2023) define MALL as a language approach tool facilitated by mobile devices. In addition, Bezircilioğlu (2016) stated that MALL is a tool for language learning that integrates mobile devices. Mobile devices act as an extension of learning tools, especially in bringing new experiences and skills to English language learning, both inside and outside the classroom. García Botero et al. (2019)

mentioned that students tend to choose mobile phones as learning tools because of their convenience and flexibility, along with the integration of technology in the learning process. The role of mobile phones as a means of language learning among students is growing in the context of classroom learning. In this context, the Duolingo application is one form of MALL implementation used to improve English students' vocabulary mastery.

2. The Principles of MALL

Mobile Assisted Language Learning (MALL) has distinctive characteristics in the application of technology for language learning. Elias (2011) argues that there are several main principles of MALL, which are as follows.

a. Flexible use

Learning design in MALL should consider individual preferences, varying schedules, internet connectivity levels, and the type of content students prefer. Aminatun and Oktaviani (2019) also added that students can improve their mastery of English vocabulary through digital media because the application provides various educational materials. Rinanda and Samiati Tarjana (2019) stated that mobile applications allow the learning process to occur in formal and informal environments. Duolingo, as MALL, allows students to learn flexibly and independently anytime and anywhere, according to the needs and learning styles of each student.

b. Equitable use

Learning materials should be accessible to users with various ability backgrounds and under diverse learning conditions. This includes the availability of learning materials and tasks that can be accessed through various types of devices, including smartphones. In this context, the Duolingo application as a form of MALL supports this principle as it can be used by anyone, anywhere, with just an internet connection and a mobile device.

c. Instructional

The instructional principle refers to how the teaching-learning process is facilitated through mobile devices. MALL supports learning through

features such as interactive quizzes, educational games, reminder notifications, and structured learning systems. Duolingo, as MALL, applies this approach by presenting material in the form of gamification as points, levels, and daily challenges-which helps increase student motivation and active engagement in learning.

d. Lenience for error

The mobile learning environment should also allow students to make mistakes without pressure, as mistakes are a natural part of the language learning process. Duolingo as a MALL facilitates this through auto-correction systems, repetitive practice, and learning features that do not penalize mistakes directly, thus creating a comfortable learning atmosphere and supporting students' courage to try.

3. The Concept of Duolingo as a MALL

The application of MALL in language learning can be seen directly through the use of the Duolingo application. According to Morales and Reyes (2016) Duolingo is a free language learning platform and text translation service supported by user contributions, created for people worldwide to learn different languages by two creators, Luis von Ahn and Severin Hacker. In addition, Ahmed (2016) stated that Duolingo is a language learning tool based on an application and website. Therefore, as expressed by Ritonga et al. (2022) Duolingo can be used as an online language learning tool that makes learning English easier, one of which is to acquire vocabulary. Hidayati and Diana (2019) explains that Duolingo is an application that presents language learning through games and focuses on vocabulary acquisition for students. In conclusion, Duolingo is a platform for language learning through an application and website designed to facilitate learning a language, especially vocabulary mastery. Duolingo is an online learning tool that provides interesting game-based learning.

Duolingo aligns closely with MALL principles. It enables anytime-anywhere learning, supports self-directed and flexible study, and fosters

engagement through interactivity and personalization, key components of effective mobile-based learning as described in MALL theory. This is in line with Munday (2016) stated that some advantages of Duolingo: a language learning tool that can increase student engagement, can be accessed through mobile phone (e.g, Android, iOS, and Windows-based mobile phones), and a language learning medium that can be accessed anywhere and anytime. In this context, Duolingo as a MALL is utilized as a tool to improve the vocabulary mastery of EFL learners. It will be challenging to understand English skills if students do not acquire a good vocabulary. Therefore, vocabulary is essential for understanding a language. Teachers must know interesting tools or methods for teaching vocabulary to students.

4. The Features and Procedures of Using Duolingo

Students can use the features in Duolingo because they are easy to understand. This is in line with Sri Redjeki and Muhajir (2020), Duolingo is the most comprehensive online language learning platform, with a simple, attractive design and a clean, intuitive user interface compared to similar apps. Duolingo improves language acquisition and retention through a variety of activities, such as translation, matching, and speaking or pronunciation exercises (Kazu and Kuvvetli, 2025). Similarly, Muddin (2018) stated that five features or activities can be used in learning using Duolingo, as follows:

- a. First, Duolingo presents vocabulary exercises by matching images. The Duolingo app presents an interesting blend of text and audio-visual-based exercises (Nita et al., 2023). By combining written text, sound, and images, Duolingo creates an interactive and non-boring learning experience. In this section, students are asked to choose the correct image and vice versa.
- b. Second, Duolingo provides sentence translation exercises. Translation exercise allows users to switch sentences or words from a language they already know to a language they are learning, or vice versa (Nushi and Eqbali, 2017). Students are asked to translate from their first language to their second language and vice versa. There are two translation

techniques: first, students answer questions by choosing the vocabulary and arranging it into a correct sentence; second, they can directly type the correct sentence based on the questions provided. This activity improves bilingual skills by encouraging students to actively process and understand the meaning of vocabulary or sentences in both languages. This exercise is closely related to vocabulary development because it helps students expand their vocabulary in both languages.

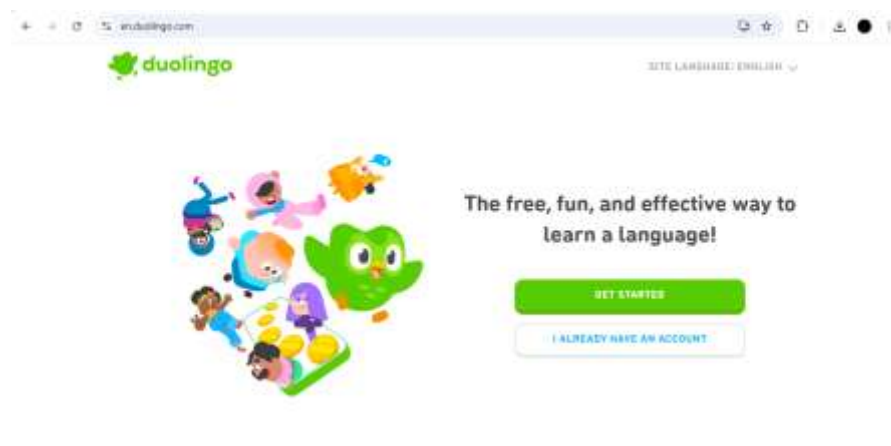
- c. Third, Duolingo also provides listening exercises. Listening skills are important for good communication. Duolingo can improve students' listening skills. This can be proven by previous research from Putri and Islamiati (2018) Duolingo can improve students' listening skills. In this section, students would be given audio to listen to. Students must try to write down what they hear according to what is in the audio. If it is difficult to listen to what is being said, Duolingo also provides a feature to slow the speed of spoken sentences. This activity helps students improve their ability to recognize the pronunciation of vocabulary and sentence structure in English. In addition, writing down what students hear helps them pay attention to details such as spelling, strengthening their vocabulary mastery abilities.
- d. Fourth, Duolingo provides speaking or pronunciation exercises for students. In this section, students are given sentences. Students have to try to say the sentence out loud in English. This activity is also carried out to train students' pronunciation, fluency, and confidence in pronouncing English vocabulary. In addition, according to Suryanto (2024), the speaking exercises in the app also increase student engagement, as they not only aid comprehension of the material but also encourage active and effective learning in improving their English skills.
- e. Finally, Duolingo also provides a fill-in-the-blank exercise. Duolingo presents exercises in various forms, such as fill-in-the-blank, matching, translating, listening, and speaking, thus creating a fun learning

atmosphere for users (Irzawati and Felisya Unamo, 2023). Fill-in-the-blank exercises are tasks where users are asked to fill in the blanks in a sentence or phrase with the right word. This exercise helps improve understanding of grammar and vocabulary in a meaningful context. In this section, students are given two or three choices and must make the correct choice. Students would be given a sentence with gaps. Students must try to complete the sentence using the word choices provided by Duolingo. This activity is closely related to vocabulary development because it requires students to choose the correct word from a set of choices to complete the sentence so that it is meaningful.

According to Yuwono (2022) Here are some procedures to create and play the Duolingo application.

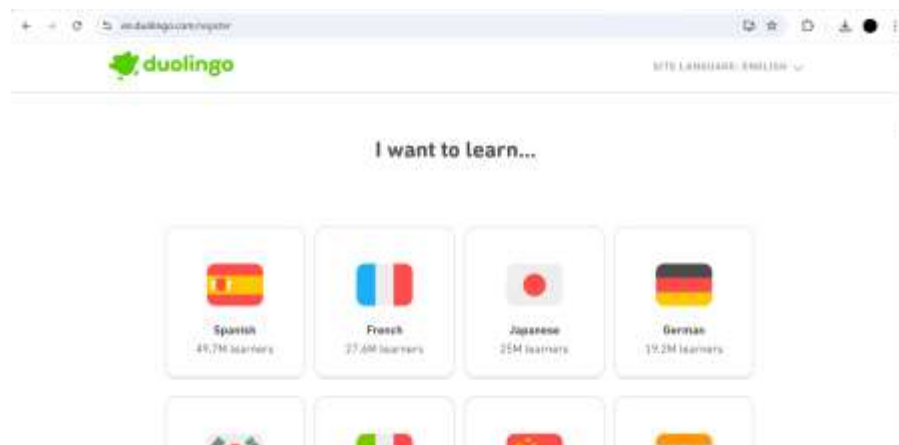
- a. Download the Duolingo app on the App Store/Play Store or open it on the website at www.duolingo.com.
- b. Click "Get Started" if you don't have an account yet.

Figure 1. The procedures to create the Duolingo



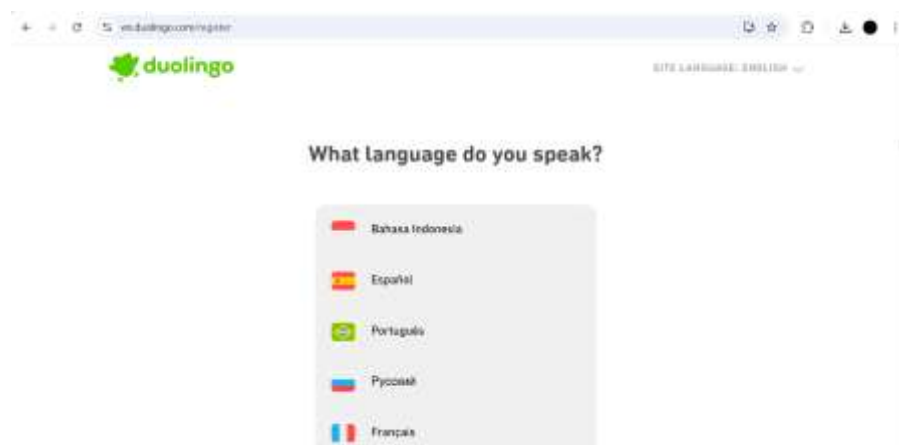
- c. Select the language to learn, in this context select "English".

Figure 2 The procedures to create the Duolingo



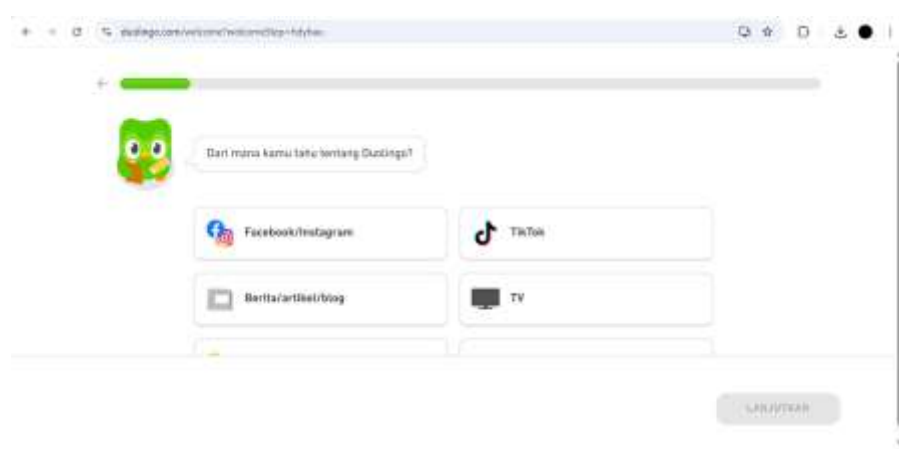
- d. Select the language we use, in this context, select "*Bahasa Indonesia*".

Figure 3. The procedures to create the Duolingo



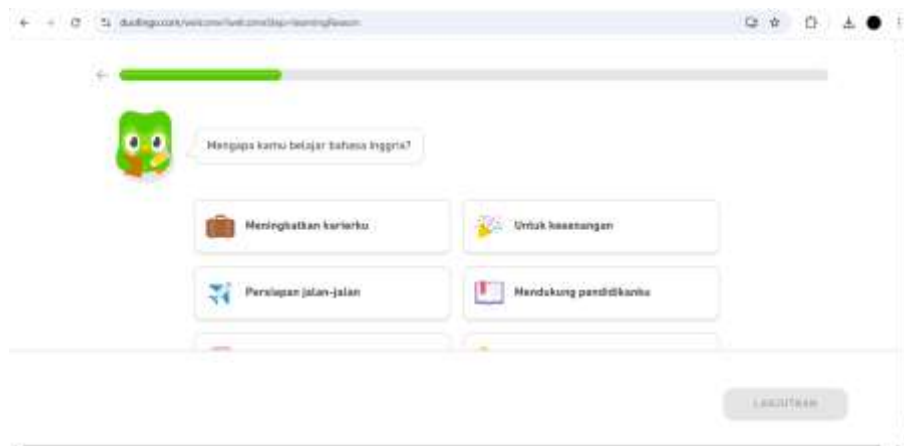
- e. Click according to where you heard about Duolingo.

Figure 4. The procedures to create the Duolingo



- f. Click according to your goal.

Figure 5. The procedures to create the Duolingo



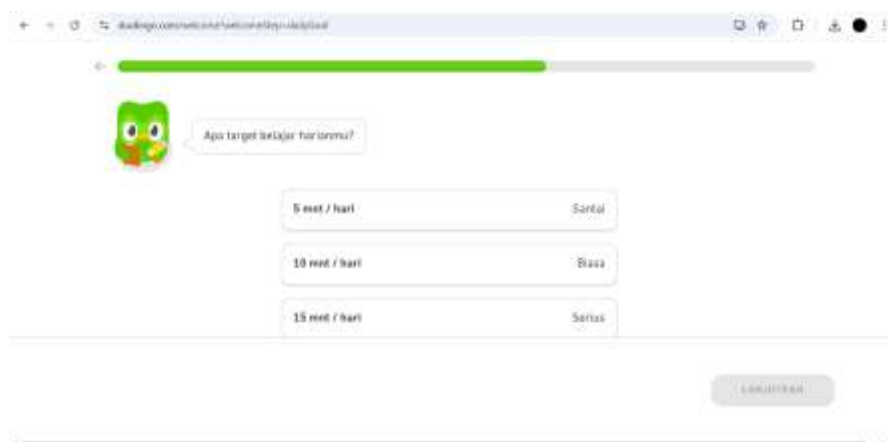
g. Click based on your ability.

Figure 6. The procedures to create the Duolingo



h. Choose the learning target according to what you want.

Figure 7. The procedures to create the Duolingo



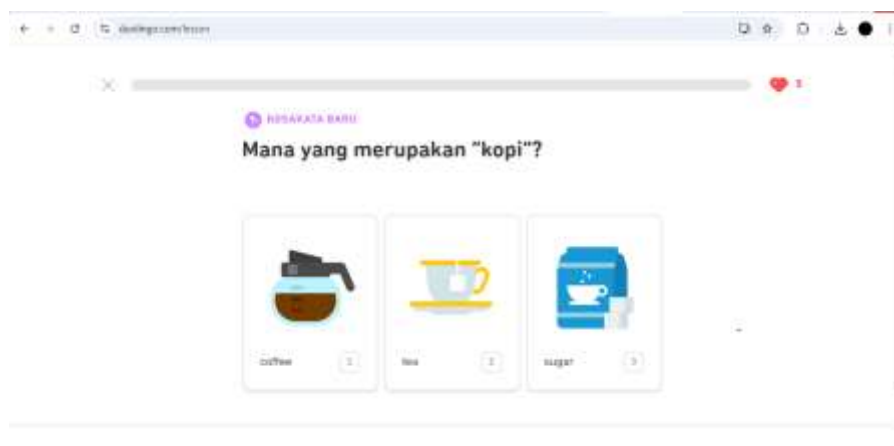
i. Click according to what you want.

Figure 8. The procedures to create the Duolingo



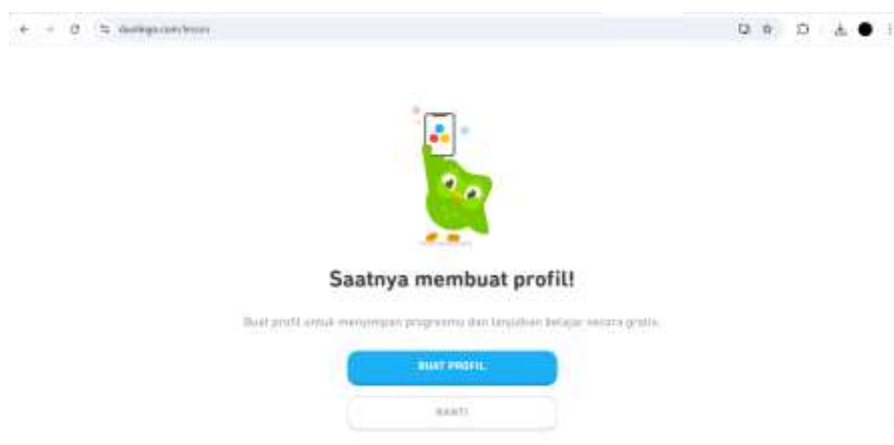
j. Choose the correct answer.

Figure 9. The procedures to create the Duolingo



k. Click "*Buat profil*".

Figure 10. The procedures to create the Duolingo

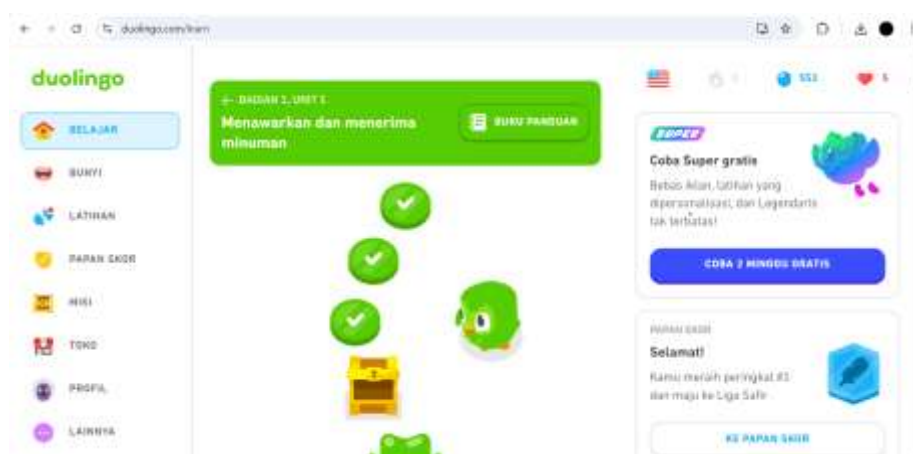


l. Create an account.

Figure 11. The procedures to create the Duolingo

- m. In this section, you can start with Section 1. To open the next section, you must complete the mission in Section 1 first, and so on.

Figure 12. The procedures to create the Duolingo



5. The Principles of Teaching Vocabulary through Duolingo as a MALL

In the teaching process, teachers need to adapt learning to the students' cognitive development stage. According to Piaget (1964), there are four stages of cognitive development: sensorimotor stage (0–2 years), where children learn through their senses and movements and begin to understand object permanence; pre-operational stage (2–7 years), when children use symbols like words and pictures but think egocentrically and struggle with consistent logical reasoning; concrete operational stage (7–11 years), where children develop logical thinking about concrete objects; and formal operational stage (12 years

and above), where they can think abstractly, logically, and solve problems, although not all children reach this stage in the same way.

Piaget (1964) suggested that learners in junior high begin transitioning into logical thinking stages, though still relying on tangible experiences. Students begin to be able to classify, sort, and understand the relationship between concepts, but their understanding of abstract things is not yet fully developed. Therefore, in learning English vocabulary, it is important to use an approach that is appropriate to the stage of cognitive development. One effective media is Duolingo, a MALL-based learning application, which presents vocabulary exercises visually, interactively, and contextually. This is in line with the principles of vocabulary teaching. According to Nation (2005) there are six principles of teaching vocabulary.

a. Keeping simple.

This means that when teachers teach vocabulary to students, the vocabulary taught should be easy to understand and simple so that students are not confused and can understand the vocabulary well. This is in line with the principle of teaching vocabulary, which is to allow students to access simple learning materials anytime and anywhere, so that vocabulary learning becomes flexible. Duolingo, as a MALL, presents vocabulary and exercises in a simple and easy-to-understand form. The app uses illustrations, short sentences, and hands-on exercises to introduce new vocabulary in a way that is not confusing for beginner learners.

b. Connect current instruction to prior knowledge through patterns or analogies.

Students can build meaningful associations in their memory by connecting new vocabulary with their existing knowledge by highlighting patterns or analogies. Through the MALL, students can explore relationships between vocabulary repeatedly, with digital media that supports pattern and association learning. Duolingo, as MALL, adapts practice materials to students' learning abilities and progression. That is, when students have mastered a few words, the application introduce new

vocabulary that is still related to the previous words. This pattern is done repeatedly so that students get used to it and understand more.

c. Utilizing both written and oral forms.

This means teachers should implement written and oral vocabulary instruction more effectively. This will allow students to interact with words in multiple modalities and improve their comprehension. With MALL, students can read text, listen to native speaker audio, record their voice, as well as type answers directly on the app. Duolingo actively trains listening, speaking, reading, and writing skills. Students are asked to pronounce vocabulary, retype what they hear, and read texts.

d. Give more focus to words that are already partially recognized.

Students should pay more attention to frequently heard or spoken words to facilitate learning and improve vocabulary mastery. MALL helps personalize learning, prioritizing relevant vocabulary for individual students based on their learning progress. Duolingo uses an adaptive algorithm that identifies words that students are already partially familiar with and reinforces them with spaced repetition. This helps students to remember vocabulary they frequently encounter, making it easier to master.

e. Highlight words that have a high frequency.

This means that students should pay attention to high-frequency vocabulary for future attention to help prioritize vocabulary learning. Students can also focus on frequently used vocabulary. As MALL, Duolingo emphasizes teaching high-frequency vocabulary first, such as basic verbs, common nouns, and functional phrases that are frequently used in communication.

f. Avoiding unrelated or poorly known words.

Students should not be introduced to other less commonly used words, such as synonyms and antonyms, to avoid confusion. With MALL, students are not given high-level vocabulary right away, but are guided gradually and contextually. Duolingo does not introduce words that are uncommon or too

difficult in the early stages. Teaching is gradual and structured, avoiding cognitive overload on students.

6. Definition of Vocabulary and Vocabulary Mastery

Vocabulary is one of the components of a language that a person uses to read, write, listen, and speak. Vocabulary represents the set of words in a language. There are several definitions of vocabulary from several researchers. Susanto et al. (2017) have stated that vocabulary means processing words in a language using excellent skills. Hornby (1995) stated that vocabulary refers to words in a language. Endarto and Subekti (2020) argued that one of the most basic and essential components in mastering a language is vocabulary. Moreover, Nikolov (2009) said that vocabulary is one component that contributes to understanding and communication in language. In addition, Hatch and Brown (1995) stated that vocabulary is a collection of words speakers use in a particular language. Based on those definitions, vocabulary is a collection of words in a language mastered by a speaker to support understanding and effective communication. Vocabulary is an essential component of language proficiency used by a person in reading, writing, listening, and speaking skills.

Vocabulary mastery refers to an individual's ability to understand, use, and master vocabulary in a language. This is in line with what is explained by Rahmah et al. (2023), that vocabulary mastery is an individual's ability to understand and master words. Rohmatillah (2017) also states that communication in a second language becomes more difficult without vocabulary mastery. Vocabulary mastery also refers to a student's ability to recognise and understand all the vocabulary presented in a vocabulary test (Hariati, 2020). Thornbury (2002) reveals that mastering vocabulary includes a comprehensive understanding of various aspects of vocabulary, such as meaning, spoken and written forms, grammatical behaviour, derived forms of words, and collocations. In addition, vocabulary mastery also includes the use of words in speaking and writing contexts, the connotations or associations attached to words, and the frequency of their use in language. According to

some arguments above, vocabulary mastery is important to learning a language. Vocabulary mastery allows students to express themselves more clearly and precisely, facilitating better interaction in social and academic settings. In addition, vocabulary mastery also contributes to reading comprehension, as a strong vocabulary allows students to translate and interpret texts more efficiently.

7. Aspects of Vocabulary

According to Cameron (2001) There are four aspects of vocabulary, which are as follows:

a. Meaning

In this aspect, meaning is the meaning of a vocabulary and how it relates to other vocabulary. A dictionary is one tool for finding the meaning of vocabulary. Nation (2019) states that meaning consists of meaning and form, reference and concept, and association. In meaning and form, what form can be used to express this meaning, and what the meaning of the words is. In reference and concept, it is important to understand what objects can be referenced and what elements they include. In association, what other words come to mind, and what other words are used as substitutes is.

b. Spelling

Spelling, in this aspect, means spelling a word or pronouncing the letters of a word one by one. Spelling is the process of correctly composing a word from its constituent letters, or the way a word is written correctly (Andriani and Sriwahyuningsih, 2019). Spelling is usually used for students who are still learning to read. In addition, this spelling aims to help mention words not understood by the listener.

c. Grammar

Grammar is one of the most important aspects of the English language, as it not only serves to structure sentences properly but also plays a role in determining the meaning of the sentence (Yuliawati, 2018). Grammar refers to the language structure used to create a sentence or paragraph to become more precise and structured.

d. Pronunciation

Pronunciation means the way a person pronounces vocabulary when using a language. This is an essential aspect of vocabulary because it is used in communicating, especially when using a foreign language. To be a good speaker, students need to have proper pronunciation skills. If the pronunciation of words is done incorrectly, it can make it difficult for listeners to understand the meaning and can even lead to misunderstandings (Ambarwati and Mandasari, 2020). So, in learning pronunciation, students must know how to pronounce the sounds of vocabulary correctly.

8. Assessment of Vocabulary

Vocabulary assessment is a systematic process of measuring the extent to which a language learner understands and uses vocabulary in various contexts. This is in line with Read (2007) that vocabulary assessment refers to efforts to measure students' vocabulary knowledge in a second language (L2). Additionally, Nation (2001) emphasizes that effective vocabulary assessment should consider not only the breadth of vocabulary knowledge (the number of words known) but also the depth of knowledge (the understanding of meanings, usage, and associations of those words). According to Coombe (2011) Several kinds of vocabulary assessments include the following.

a. Multiple-choice question

A multiple-choice question is a standard question format used in language tests. It comes in many forms, but its basic structure is a choice of answers that includes a crucial or correct answer. In multiple-choice items, there is usually only one correct answer.

b. Matching formats

In the matching format, students are often given two columns of data. Matching the two columns is the student's task. Options are on the right, and premises are on the left.

c. Sentence completion or gap-fill items

In sentence completion or gap-filling questions, students must read a sentence and write the correct content or response. These questions take

longer to complete. However, students are helped to learn and know the word being tested rather than simply recognize it.

d. Translation

In translation, students' productive vocabulary knowledge is assessed. For the translation to be effective, the teacher must know the student's first language.

In conclusion, selecting appropriate vocabulary assessment methods is essential to provide accurate information about students' vocabulary knowledge and to effectively support their ongoing language learning. In this context, vocabulary assessment is used to evaluate the improvement of students' English vocabulary mastery through the use of Duolingo as a Mobile-Assisted Language Learning (MALL).

B. Study of the Relevant Research

Several studies have explored using Duolingo in the learning process.

First, Permatasari et al. (2022) examined the effects of using Duolingo on students' vocabulary mastery. This study seeks empirical evidence regarding the impact of the Duolingo application on students' vocabulary mastery at SMPN 2 Banjarsari, Lebak-Banten. This study utilized a quantitative methods approach with a quasi-experimental design. The study's findings showed that students' vocabulary mastery significantly improved when they used Duolingo.

Second, Megawati et al. (2023) examined using Duolingo to improve students' vocabulary. This study investigates the impact of using Duolingo on students' vocabulary, especially in verbs (transitive and intransitive) at SMP Negeri 1 Kelara. The quantitative research approach was applied in this study. The study indicated that Duolingo had a positive impact on improving students' vocabulary because it makes the learning process more engaging. Through interactive image features, students can quickly learn and understand new vocabulary.

Third, Borang et al. (2023) examined the use of Duolingo to increase students' vocabulary mastery. This study uses quantitative research to determine whether the Duolingo Application can help students improve their vocabulary mastery,

especially with adjectives. The results are that Duolingo can improve students' vocabulary mastery. Using Duolingo provides a positive contribution and better results in students' English vocabulary skills.

Although some studies have been conducted on Duolingo in the classroom, this study used a Classroom Action Research design with qualitative and quantitative data collection and analysis methods. This study provided new insights into Duolingo so that EFL students can master their vocabulary.