

CHAPTER 2

LITERATURE REVIEW

2.1 Theoretical Framework

2.1.1 Technology-Enhanced Language Learning

Technology has many important benefits in the language learning process. The language learning process can be done with the technology used inside or outside the classroom through the use of devices such as computers, laptops, tablets, and mobile phones. Zhang and Zou (2020) stated that technology is beneficial in second language acquisition such as motivating learners to practice English, providing learning materials, enabling interaction among students, and changing teaching methods. In addition, technology can increase student engagement, improve academic performance, facilitate the transition from teacher-centered to student-centered approaches, encourage collaborative writing, and lower anxiety levels (Gilakjani, 2017).

In addition, there was a study of using technology to improve language learning and instruction, which is known as Technology-Enhanced Language Learning (TELL). TELL's primary goal is to identify methods for teaching and learning the language using technology. TELL refers to the application of technology to enhance and expedite learning in the educational environment (Golshan & Tafazoli, 2014).

There are many benefits of TELL in language learning. As stated by Zhou and Wei (2018), TELL is any language learning activity that makes use of tools and/or technology for efficiency, motivation, and flexibility in learning styles. Golonka et al. (2014) discovered that the following benefits of technology were observed in language learners: (1) increased motivation, efficiency, and frequency of communication; (2) increased language knowledge and skills (e.g., speaking, listening, vocabulary, and grammar); (3) enhanced input resources; and (4) promoted peer feedback. Therefore, this review shows the benefits of technology-enhanced language learning.

Nowadays, games play a crucial role in language learning. Games offer interesting, rewarding, and creative learning possibilities for students. Games are divided into two categories: those designed primarily for fun and those created with a purpose for learning. Teachers can organize games into educational tasks and display educational materials on the gaming platform. After class, students are free to play games as another way to enhance their language skills. Moreover, it has been discovered that learners who used serious games learned more in less time and more effectively than those who did not. Games were used to improve various language skills, including speaking, listening, pronouncing words correctly, and developing vocabulary (Shadieff & Yang, 2020). Thus, games are one of the digital tools that can be used in language learning.

2.1.2 Technology Enhanced Language Learning in Vocabulary Learning

Many studies have proven that TELL tools positively impact EFL learners' vocabulary learning.

1) Websites Portals

A study has investigated the use of web portals in vocabulary learning. Lim (2014) investigated how student interpreters may find and gather vocabulary with the help of web portals. The findings showed that language learners could carry out vocabulary-building tasks more efficiently by using websites and digital resources to search for the necessary vocabulary and create larger and richer vocabulary pairs.

2) Electronic Gloss or Annotation

A study has examined the use of electronic gloss in vocabulary learning and improvement. Ramezanali and Faez (2019) found that learners can learn vocabulary and improve delayed word retention by using various kinds of gloss presentation, including SL definition, audio, and video animation.

3) Electronic Dictionary

A study has investigated the use of electronic dictionaries in vocabulary learning. Karras (2016) discovered that participants' ability to learn vocabulary increased considerably when they received online dictionary learning instruction. Click-on and key-in word dictionaries (CWD and KWD) are the

most often used dictionaries. Learners are expected to type the word into the dictionary in KWD. In the meantime, CWD minimizes attentional dissonance and searching time by enabling students to click words with a mouse. Nevertheless, the advantages of employing an electronic dictionary are limited because of the unpredictability of choosing a word definition that suits the situation and the influence of students' preexisting vocabulary size on the search processes.

4) Blogging

Arndt and Woore (2018) compared vocabulary acquisition methods using video blogs and blog writing. The findings demonstrated that the online medium of video blogs enhanced memory of the target words' grammatical functions as well as recognition and memorization of their meanings. On the other hand, written blog entries encouraged a greater understanding of orthography.

5) YouTube Video

Heriyanto (2015) conducted a study on students' perceptions of vocabulary growth during reading activities using YouTube videos. According to the findings, most students agreed that watching YouTube videos helped them comprehend vocabulary better; almost ninety of them reported that this improved their pronunciation; eighty-one percent said that they actively participated in their learning; and seventy-one percent said they enjoyed their learning space.

6) Mobile applications

Klimova and Polakova (2020) studied students' perceptions of a mobile application for learning EFL vocabulary. The results demonstrated that the student's usage of the mobile application to test their vocabulary knowledge was more enjoyable and less stressful, helped them become more confident in their learning, enhanced their pronunciation, improved their memorization of vocabulary, received timely feedback, and had good effectiveness. In another study, Tran (2016) examined how students perceived the use of Quizlet for vocabulary learning and how they discussed their learning on Facebook. The

results showed that students actively and repeatedly studied vocabulary outside of the classroom with Quizlet, and Facebook facilitated their discussion. Besides that, other studies stated that Facebook positively affects learning English idioms (Kabilan & Zahar, 2016). Hence, the use of mobile applications has a positive impact on vocabulary learning.

7) Games

Ali et al. (2022) examined how well students retained new vocabulary after playing the online game OnVac, which teaches vocabulary. Furthermore, this study found that OnVac can help students learn specific vocabulary. In addition, about how the system works, the participants said that because of its simplicity of use, the tool can aid in their learning of engineering and technology vocabulary. Therefore, using games to learn English vocabulary has many positive effects.

2.1.3 Duolingo as a Language Learning Application

Duolingo is a language learning website and application that is designed in the form of games and available for iOS and Android. According to Loewen et al. (2019), Luis von Ahn and Severin Hacker founded a free language and science learning program called Duolingo in 2011. It is designed as a game with phases and obstacles. Each level introduces new obstacles for accumulating points and completing numerous tasks. Furthermore, it is regarded as a multilingual program because it allows users to learn various languages, including French, Greek, Arabic, Dutch, and English. Even though other languages are available for learning, English is the most popular. In addition, Duolingo is an easy-to-use game-based application with levels, repetition, and grammatical translation that can provide supplemental exercises and courses (Munday, 2016). Duolingo provides learners with a simple way to acquire and practice their language abilities, particularly vocabulary. Wagner and Kunnan (2015) stated that there is a vocabulary task in the Duolingo application where there are words on the screen and then the test taker must choose which word is correct. The task is in the form of spelling, translation, and multiple-choice word recognition questions (Shortt et

al., 2023). Thus, Duolingo as a language learning application can motivate students to learn English vocabulary.

In conclusion, Duolingo is a free language learning website and application in 2011. It is a gamified game that lets users learn other languages, including English, with stages and challenges. With levels, repetition, and grammatical translation, Duolingo is an easy-to-use tool that also offers extra tasks and courses. In addition, this application offers vocabulary tasks such as spelling, translation, and multiple-choice word recognition challenges that can motivate users or students to acquire English vocabulary. With this application, language learners can improve their competence in various areas, including learning vocabulary. Therefore, students can use Duolingo to learn English vocabulary.

2.1.3.1 Features on Duolingo

1) Guidebook per Unit

Duolingo offers a guidebook that contains important words or sentences related to the material covered in each unit. In this feature, there are words or sentences in English and Indonesian versions that make it easier for users to learn languages.



Figure 2. 1 Guidebook per Unit

2) Exercises

Duolingo has various exercises:

a. Translation Exercise



Figure 2. 2 Translation exercise

b. Listening Exercise



Figure 2. 3 Listening exercise

c. Listening and Speaking Exercises



Figure 2. 4 Listening and speaking exercises

d. Matching Exercise

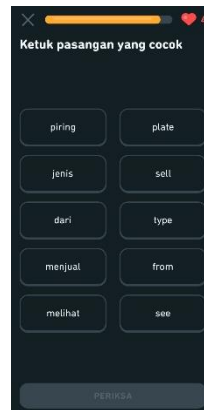


Figure 2. 5 Matching exercise

e. Pronunciation Exercises

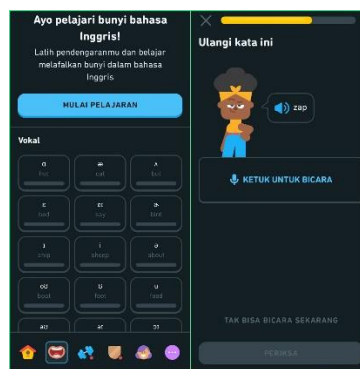


Figure 2. 6 Pronunciation Exercises

3) Story

Duolingo has an exercise in the form of a story. Users will listen to the story in the form of a dialog, then there will be questions after the dialog.



Figure 2. 7 Exercise in story form

4) Leagues

There are various leagues in Duolingo, namely Bronze, Silver, Gold, Sapphire, Ruby, Emerald, etc. Playing frequently and earning points increases the chances of reaching the top, but each league has boundaries. Users will go to the previous league if they are under the boundary.



Figure 2. 8 Leagues

5) Achievements

In Duolingo, users will earn achievements if they complete challenges.



Figure 2. 9 Achievements

6) Missions

Within Duolingo, there are daily missions that each user must complete.

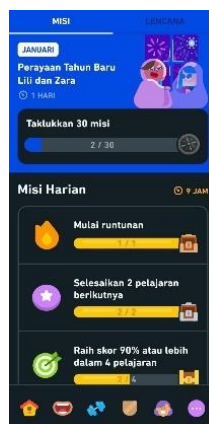


Figure 2. 10 Missions

7) Streak

Streak shows the user's calendar routine of playing Duolingo from day one. They will lose streak if they do not play Duolingo for a day.



Figure 2. 11 Streak

8) Diamond

In Duolingo, diamonds can be used to buy time boosters, hearts, etc.



Figure 2. 12 Diamond

9) Heart

In Duolingo, the user will only have five hearts. One heart will be deducted for each incorrect response, and so on. There are three ways to get more hearts when the user is out of hearts. The first option is to purchase hearts with diamonds. The second option is to purchase Duolingo Pro, which will

give the user a limitless heart. Then, the last option is to complete the unusual exercise, where Duolingo will award one heart to the user each time they complete it.



Figure 2. 13 Heart

10) Badges

Within Duolingo, if the user can complete the monthly missions, it will earn badges.



Figure 2. 14 Badges

2.1.4 Vocabulary Learning in Second Language Learning

In learning a second language, one of the most important linguistic skills is expanding vocabulary. According to Yaacob et al. (2019), vocabulary is considered important in language use and foreign language learning. In addition, vocabulary is a set of terms that one must know in order to speak well (Bai, 2018). Furthermore, Schmitt (2014) said that vocabulary consists of two categories: (1)

productive vocabulary, which is learned through writing or speaking, and (2) receptive vocabulary, which is learned through listening or reading.

Learning vocabulary is the first step to mastering a new language. One cannot read, write, understand, or speak in a foreign language if their vocabulary is limited (Rubin & Tompson, 1994). However, expanding one's vocabulary also involves learning knowledge that includes meaning, pronunciation, spelling, part of speech, and more (Rasouli & Jafari, 2016).

Nation (2013) stated that there are three aspects of vocabulary learning:

- 1) Form, which is the spoken and written form of a word, including word parts, word spelling, and word pronunciation;
- 2) Meaning, which is the relationship between the form and meaning of a word (how the form of a word can be used to express meaning);
- 3) Use, it involves grammatical functions, collocations, and usage restrictions.

Moreover, the above aspects affect students' productive and receptive vocabulary learning. Receptive vocabulary learning is a type of learning that recognizes word form received through reading or listening activities and then can deduce its meaning from memory (Nation, 2013). Meanwhile, productive vocabulary is used to retrieve and produce the proper spoken or written word form and convey meaning while speaking or writing. Hence, those three aspects of vocabulary are associated with students' productive and receptive vocabulary learning.

In addition, theoretically, Deng and Trainin (2015) stated four research-based vocabulary learning strategies can be employed with a variety of mobile applications:

a. Dictionary Use

In the process of vocabulary development, dictionary use has an important role. According to Nation (2013), a dictionary has three purposes:

- 1) Comprehension, dictionaries are used to look up unfamiliar words or validate words inferred from context when they are encountered in reading or listening;

- 2) Production, dictionaries are used to look up unfamiliar words or word parts needed for writing and speaking;
- 3) Learning, the dictionary is used to expand vocabulary knowledge by studying etymology or various contextual uses.

Nation (2013) also makes the case that proficient English speakers make excellent use of dictionaries in both receptive and productive contexts. In receptive ways, students can determine if a word fits by gathering information from the context in which it appears, selecting the appropriate entry or sub-entry, and relating the meaning to the context. In productive ways, they can identify desired word forms, ensure the word is not subject to undesired usage restrictions, figure out its grammar and collocations, and validate its spelling or pronunciation before applying it.

Currently, there are applications for dictionaries that can facilitate vocabulary learning, including Word of the Day, thefreedictionary.com, Merriam-Webster dictionary, etc. Moreover, with the help of these dictionaries, students can find out the definition of a particular word, how to pronounce it, the history of the word, synonyms, and even antonyms. Therefore, these application dictionaries are easily accessible and can support learning English vocabulary.

b. Phonological analysis

Phonological analysis is learning words by analyzing sound parts. Students have difficulty understanding vocabulary sounds in English. First, they struggle because the sound system is not common across all languages. Ultimately unfamiliar with the phonology of the target language and frequently unable to clearly hear or produce certain sounds. For example, the sound /th/ is unfamiliar to Hebrew speakers. The second difficulty is that different graphemes in English can have the same sound (e.g. rough and ruff), and similar orthography and graphemes can be pronounced differently (e.g. gh in rough and dough). Therefore, the existence of mobile applications (for example, Hearbuilder Phonological Awareness, Merriam Webster Dictionary, The Free Dictionary, Dictionary.com, Dragon Dictation, etc) can be used to

learn phonological information in long-term memory so that the language learner lexicon will expand. Thus, phonological analysis is an essential strategy to enhance their understanding of new word sounds. As a result, makes it easier for them to retain those sounds in long-term memory.

c. Morphological analysis

Morphological analysis is learning word meanings by analyzing their componential word parts. A morpheme can be a single word (for example, *land*) or a significant part of a word (*multi-*, *facet*, and *-ed* in the phrase *multifaceted*). The morphological analysis employs several strategies, such as identifying word relationships within the same word family, segmenting words into smaller meaningful parts, and determining a word's grammatical role based on syntactic context (Nagy & Scott, 2001). Prefixes, suffixes, compounds, and word roots are among the morphemic components that can be examined to understand numerous unknown words. This is where morphological analysis comes in useful (Carlisle, 1995; Nagy & Scott, 2001; Nation, 2013). Therefore, through this strategy, students will learn vocabulary faster and learn the meaning of the words from morphological knowledge. Hence, there are examples of mobile apps for enhancing morphological knowledge, namely Tangled Roots, Vocabulary Practice: Greek and Latin, Roots to Words, etc.

d. Contextual analysis

Contextual analysis is learning word meanings by referring to learning context. Students examine surrounding text, particularly phrases and sentences that provide syntactic and semantic cues, to gain an understanding of word meanings through context clues (Nagy & Scott, 2001). According to Diamond and Gutlohn (2006) stated that common examples of context clues are as follows:

- 1) the author's direct definition of an unfamiliar word;
- 2) an appositive definition of the unfamiliar word, in which the new word is defined by a word or phrase previous to it;
- 3) synonyms or antonyms of the unfamiliar word;

- 4) examples of the unfamiliar word;
- 5) nonspecific clues to the meaning of the unfamiliar word, which are frequently scattered across a number of sentences.

Hence, according to Nagy and Scott (2001), using this method can help students become more proficient in reading comprehension and infer vocabulary by learning the meanings of words they are not taught. Therefore, there are examples of mobile applications that used contextual analysis namely USA TODAY, NPR News, and Kindle.

2.1.5 Duolingo and Vocabulary Learning

In several studies, the use of Duolingo has been examined. Numerous studies have emphasized the benefits of using Duolingo to develop language proficiency in speaking (Alfuhaid, 2021; Niah & Pahmi, 2019), reading (Hakimantiek et al., 2022; Sarie & Anggraeni, 2020), listening (Arumsari & Octaviani, 2022; Putri & Islamiati, 2018), and writing (Syahputra, 2019) skills. The other discussed how to increase students' motivation via Duolingo (Habibie, 2020; Ünal & Güngör, 2021; Zeng & Fisher, 2023) and what benefits and drawbacks (Nushi & Eqbali, 2017; Perez, 2020) may result from the incorporation of Duolingo in English learning activities. On the other hand, other people are interested in integrating Duolingo to improve their knowledge of grammar (Redjeki & Muhajir, 2021) and vocabulary (Cesarini et al., 2021; Hernadijaya, 2020).

Studies employing seamless vocabulary learning strategies to improve and activate learners' target vocabulary across contexts have increased in number as a result of the emergence of mobile technologies. Studies have been done to improve vocabulary acquisition by using instant messaging to provide content to learners (Li et al., 2017). To improve vocabulary learning for EFL (English as a foreign language) and learner motivation, several studies have utilized ubiquitous learning games and context-aware user-generated content systems (Huang & Huang, 2015; Mouri et al., 2018; Wang & Huang, 2017).

To improve language learning, several well-known smartphone applications have been embraced, for example Memrise and Duolingo. In

addition, positive findings were obtained by Fathi et al. (2018). It examined how well Memrise and Duolingo applications supported vocabulary learning and self-regulation in a senior high school formal learning environment. However, Duolingo outperformed Memrise in terms of boosting learner motivation and language acquisition.

In reality, one of the obstacles in vocabulary learning is that English presents challenges with its rich vocabulary and polyglot origins, so the use of technology applications to assist vocabulary learning is suggested (Deng & Trainin, 2015). Hence, Duolingo is a learning language application that can be used to assist English vocabulary learning.

2.1.6 Attitude in Language Learning

Attitude is a person's response and behavior that shows liking or disliking something based on experience. According to Tahir and Tafat (2021), attitudes refer to the mental response based on a person's experience, which influences their behavior or thoughts for or against something. Furthermore, Montaña and Kasprzyk (2015) assert that an individual's attitude is influenced by their beliefs about the outcomes or attributes of their behavior, which are determined by judgments of those results or features. Moreover, Allport (1935) defined attitude as an organized mental and physical state of readiness resulting from experience that influences a person's reaction in a directed and dynamic way to every situation and thing that it is linked with. From these statements, it can be concluded that attitude is a variety of emotions, beliefs, and behaviors that determine how people behave in a range of situations. Furthermore, attitudes are divided into three aspects, namely, cognitive, affective, and behavioral. As stated by Haddock and Zanna (1999), attitudes are further divided into three categories:

1) Affective Aspect

The affective aspect refers to the emotional response to an attitude object. It refers to the term "likes" or "dislikes," "with" or "against" an object, and other related feelings and emotions (Getie, 2020). The evaluation is basically the affective component. It is the component of an attitude that determines whether the bearer of the attitude believes that an object is good or bad (Rajecki, 1982).

Interest, values, and propensity are the attributes of the affective component, and the majority of them influence our attitudes (Getie, 2020; İnal et al., 2000)

2) Cognitive Aspect

The cognitive aspect includes a person's thoughts and views about an object. The cognitive domain of attitude refers to language learners' perceptions of the information they are exposed to and how they perceive the language learning process. Four steps can be used to categorize the cognitive attitude: producing new knowledge, verifying new knowledge, integrating new knowledge in various contexts, and connecting new knowledge with prior knowledge (Eshghinejad, 2016).

3) Behavioral Aspect

The behavioral aspect refers to an individual's behaviors or behavioral intentions towards certain situations. A positive attitude encourages people to approach their behavior with positivity in studying, immersing themselves in the process, and always wanting to learn more (Kara, 2009). For instance, students are more eager to solve issues, acquire knowledge in the real world, and express their emotions.

In conclusion, those three aspects of attitudes combine to form a person's personality. Therefore, this study focuses on the student's attitude when using Duolingo in learning vocabulary.

2.2 Study of Relevant Research

There are numerous studies related to the use of Duolingo in vocabulary learning. The first study was conducted by Hernadijaya (2020). That study was explored the use of Duolingo to enhance students' knowledge and interest in learning English vocabulary through mobile technologies. The research design was Quasi-experimental. Using SPSS 20, the t-test calculation was used to analyze the data. Additionally, the researcher discovered that Duolingo is a gamified language learning program that assists in developing seventh-grade vocabulary.

Likewise, research was conducted by Cesarini et al. (2021), which examined how students feel about using Duolingo and how this application helps them to learn vocabulary. The research utilized a qualitative approach to achieve the stated objectives. The tools included an observation, a questionnaire, and a test. Based on the increased test scores, the study shows that there was a considerable impact on student's vocabulary mastery after using the Duolingo application for instruction. According to this study, Duolingo helps learners improve their vocabulary mastery.

In addition, the attitude of vocational high school students in using Duolingo to learn vocabulary was investigated by Aprilani et al. (2023). Data were collected through semi-structured interviews and analyzed using thematic analysis. The researchers found that students responded positive attitudes to the use of the Duolingo program to learn vocabulary. Furthermore, this shows study that these apps can motivate students to learn more about vocabulary. Since the previous study examined participants at the high school level, in this study, the researcher is interested in examining this at the college level. Hence, that is why the researcher is interested in carrying out the study with the title “The Students’ Attitudes to Duolingo-assisted English Vocabulary Learning” in English education students at one of the universities in Tasikmalaya.