

CHAPTER II

LITERATURE REVIEW

A. Concept of Vocabulary

1. Definition of vocabulary

Vocabulary holds an essential position in language acquisition, both for second languages and foreign languages. According to recent research, vocabulary acquisition is widely acknowledged as an essential part of learning a new language as it serves as the basis for all linguistic abilities (Abdulazizovna, 2025). In other words, an individual's vocabulary size has a substantial impact on their overall language ability.

Ahsan *et al.* (2021) emphasize that the effective understanding of reading and auditory content is significantly impacted by vocabulary proficiency, considered a core component of language. This view is in line with Hornby's (in Agustin & Ayu, 2021) that defined vocabulary as "the set of words that a person knows and uses in a given language". This definition highlights that real communication depends on vocabulary as a form of knowledge, not merely as a collection of words.

Functionally, vocabulary also plays an important role as a medium for expressing thoughts, feelings, or ideas in a meaningful way. Wulandari (2025) emphasizes that vocabulary is a tool for speakers to convey meaning

accurately. In line with this, Zeng *et al.* (2025) developing a strong vocabulary is crucial for literacy development, effective communication, and accessing complicated academic information.

Thus, it can be concluded that vocabulary is an important aspect that forms the basis of a person's language ability. Previous studies have shown that vocabulary mastery is not only related to the number of words known, but also to the ability to use those words appropriately in a communicative context. In the language learning process, vocabulary serves to connect understanding of meaning with the ability to express ideas, thereby supporting the development of the four language skills. Therefore, adequate vocabulary mastery is an important requirement for learners to understand information, process knowledge, and convey ideas effectively in various communication contexts.

2. The Importance of Vocabulary

Vocabulary mastery is one of the most fundamental aspects of learning English. A strong vocabulary enables students to communicate effectively, whether interacting with native speakers, enjoying English-language films or music, or composing messages orally and in writing. Without adequate vocabulary

mastery, students' language skills will be very limited because vocabulary is the foundation for all language skills (Chiriac, 2021).

In addition, vocabulary plays an important role for language learners at various levels of proficiency. Both beginner and advanced learners need a rich vocabulary to improve their overall communication, comprehension, and language proficiency skills. A broad vocabulary helps learners better understand the meaning of texts and utterances and express their ideas more accurately and variably (Normurodovna, 2025). Rashid *et al.* (2022) also emphasize that vocabulary is a key element in the language learning and teaching process. They state that students will not be able to understand other people's ideas or convey their own ideas without sufficient vocabulary. In other words, limited vocabulary will hinder the process of communication and comprehension, thus directly impacting the success of language learning.

Several studies also indicate that vocabulary mastery is strongly linked to other language skills. Students with a broader vocabulary tend to have better speaking skills, whereas a limited vocabulary can hinder their ability to express ideas orally (Seprisa *et al.*, 2022). In writing, a lack of vocabulary is also one of the main reasons students struggle to develop topics and ideas for

their writing (Binhomran & Altalhab, 2023). Furthermore, learners with a larger vocabulary find it easier to acquire new words from oral input because they are able to comprehend more of the information they hear (Zhang & Graham, 2020). Vocabulary knowledge also contributes to reading comprehension, particularly in understanding inferential meaning and narrative texts (Eason *et al.*, 2012, as cited in Sabag *et al.*, 2025).

Based on these views, it can be concluded that vocabulary mastery plays a very important role in English language learning. Vocabulary not only supports students' communication skills, but also forms the main foundation for developing reading, writing, speaking, and listening skills. Therefore, vocabulary learning needs special attention through effective and engaging learning strategies and media.

3. Level of Vocabulary

Vocabulary levels can be explained based on language proficiency levels in the Common European Framework of Reference for Languages (CEFR). This framework divides language proficiency into six levels, namely A1, A2, B1, B2, C1, and C2 (English, n.d.; Lew & Wolfer, 2024). These levels indicate the development of language learners' abilities from basic to proficient

levels. In general, these levels are grouped into three main categories: basic users (A1–A2), independent users (B1–B2), and proficient users (C1–C2).

a. A1 (Beginner)

At the A1 level, learners only have a command of very basic vocabulary. The vocabulary used is usually related to everyday needs such as self-introduction, family, food, objects around them, and simple activities. At this stage, students can understand and use basic expressions to communicate in very limited situations.

b. A2 (Beginner)

At the A2 level, learners begin to have a broader vocabulary than at the A1 level. They can understand sentences and expressions commonly used in everyday life, such as those related to personal information, school, the surrounding environment, and routine activities. At this stage, learners begin to be able to hold simple conversations and understand short texts that use common vocabulary.

c. B1 (Intermediate)

At the B1 level, learners can understand the main ideas of texts related to familiar topics, such as school, work, or daily activities. Vocabulary mastery at this stage is also more developed so that learners can

express their experiences, feelings, and plans in a simple way.

d. B2 (Upper Intermediate)

At the B2 level, learners have a broader vocabulary and can understand more complex texts on both concrete and abstract topics. They are also able to express their opinions more clearly and in greater detail and interact more fluently in a variety of communication situations.

e. C1 (Advanced)

At the C1 level, learners are able to use vocabulary flexibly and effectively in a variety of communication contexts. They can understand long and complex texts and express ideas fluently without much difficulty in choosing the right words.

f. C2 (Proficient)

C2 is the highest level of language proficiency. At this stage, learners have such a wide command of vocabulary that they can understand almost any form of language they hear or read. In addition, they can express ideas very clearly, accurately, and in detail in a wide range of communication situations.

In the context of English language learning at the junior high school level, students are generally at the A1 to A2 levels. Therefore, vocabulary teaching at this level

focuses more on basic vocabulary related to students' daily lives and environment.

4. Word Classes

Words are grouped into several word classes that have different functions in forming sentence structure. The main word classes in English include nouns, verbs, adjectives, adverbs, prepositions, conjunctions, and pronouns. Each word class has a specific role in constructing sentence structure and conveying meaning clearly. In addition, the identification of word classes is not only based on meaning, but also on morphological form and word position in sentence structure (Quirk *et al.*, (1985); Delahunty & Garvey (2010))

Based on this classification, the following is an explanation of several parts of speech in English.

a. Noun

A noun is a word used to refer to people, places, things, or concepts. Examples: Forest, river, tree, book, student.

b. Verb

A verb is a word that expresses an action, process, or state. In a sentence, a verb functions as the core of a verb phrase and usually indicates a specific

activity or state. Examples: protect, recycle, write, study.

c. Adjective

An adjective is a word used to describe or provide additional information about a noun. Examples: dirty, clean, lazy, beautiful, smart.

d. Adverbs

Adverbs function to describe verbs, adjectives, or other adverbs. Adverbs are often used to indicate the manner, time, place, or degree of an action. Examples: quickly, slowly, regularly, carefully.

e. Prepositions

Prepositions are words that are usually followed by a noun phrase and form a prepositional phrase, which indicates a relationship such as place, time, or direction. Examples: in, on, at, under, between.

f. Conjunctions

Conjunctions Are words used to connect two words, phrases, or clauses in a sentence. Common examples are and, or, and but.

g. Pronouns

Are words used to replace nouns to avoid repetition in a sentence. Pronouns can refer to specific people, objects, or concepts. Examples: he, she, it, they, we.

h. Interjection

An interjection is a word used to express feelings or emotions spontaneously, such as surprise, joy, sadness, or anger. This word usually stands alone and is often followed by an exclamation mark (!).

Examples: wow!, oh!, hey!.

From the above discussion, it can be concluded that word classes in English serve complementary functions in forming complete sentence structures. Each part of speech plays a role in conveying meaning, relationships, and emphasis within a sentence. Mastery of these parts of speech is essential because it helps learners use English more accurately and clearly.

However, this study focuses only on nouns, verbs, and adjectives because these word classes are the most frequently used in the Grade VIII chapter "Love Our World". Therefore, these three word classes were considered the most relevant indicators for measuring students' vocabulary mastery in this study.

5. Vocabulary Acquisitions

Vocabulary acquisition is a crucial process in language learning because it forms the foundation for achieving overall language proficiency, whether in the context of a second language or a foreign language (Radzuan & Arif, 2025). Vocabulary acquisition is not

merely about memorizing word meanings; it also involves the process of integrating words into the mental lexicon (García, 2024). In other words, vocabulary acquisition encompasses the process of recognizing new words, understanding their meanings, storing them in memory, and being able to use them appropriately in various communicative contexts.

In line with this, Ellis (1994) in Kaivanpanah *et al.* (2021) explains that vocabulary acquisition can occur through two main approaches: explicit vocabulary teaching and implicit vocabulary teaching.

a. Explicit Vocabulary Teaching

Explicit vocabulary teaching is a planned and systematic approach to vocabulary learning, in which teachers directly and clearly teach specific words and their meanings to students. In other words, students are given detailed explanations of new words and how to use them, so that vocabulary learning becomes more focused and easier to understand.

According to Masrul & Wicaksono (2023), explicit instruction involves directly teaching vocabulary words, providing detailed definitions, and practicing using these words in the context of sentences. This shows that explicit vocabulary teaching not only introduces words and their

definitions but also provides opportunities for students to practice using these words in sentences or relevant contexts, thereby improving vocabulary comprehension and retention.

The explicit approach is also defined as a deliberate and systematic method of teaching vocabulary, in which educators directly and clearly teach specific words and their meanings to students (Compton, 2024). With this strategy, students are given clear guidance on the meaning of words, how to use them, and the variety of contexts in which they may appear, so that they not only memorize words, but truly understand their use in communication.

b. Implicit Vocabulary Teaching

Implicit vocabulary teaching is an approach in which students learn new words without focusing directly on the words themselves, but rather through their involvement in other activities, such as reading, listening, or speaking. This approach is often referred to as incidental vocabulary learning, because vocabulary learning occurs accidentally or incidentally when students focus on other activities, rather than explicitly on the words themselves (Kaivanpanah *et al.*, 2021).

In implicit vocabulary learning, students can recognize and understand new words through context or the use of words in real communication. This process allows students to internalize vocabulary naturally, without having to be meta linguistically aware of it (Stratton, 2023). Overall, implicit vocabulary learning is a vocabulary learning method that emphasizes natural and indirect processes. With implicit vocabulary learning, students can develop their vocabulary contextually and improve their overall language comprehension.

Based on the discussion regarding vocabulary acquisition, it can be concluded that vocabulary acquisition is a crucial process that can be enhanced through two main approaches: explicit and implicit vocabulary instruction. In the context of this study, the use of the explicit vocabulary teaching approach is highly relevant because it provides targeted and systematic guidance and helps students understand the meaning and usage of vocabulary more clearly. Through the use of learning media such as Assemblr Edu, the explicit approach can be optimized with engaging and interactive visualizations, so that students not only receive direct explanations but can also see and understand the context of word usage more concretely.

6. Types of Vocabulary

In language learning studies, vocabulary knowledge is generally divided into two main categories, namely receptive vocabulary and productive vocabulary Nation & Coxhead (in Mukhtar *et al.*, 2023).

a. Receptive Vocabulary

Receptive vocabulary refers to the ability to recognize and understand words when learners see them in texts or hear them in conversations. This competency includes understanding word forms, spelling, pronunciation, and meaning in specific contexts. Receptive vocabulary is usually broader than productive vocabulary, because recognizing words is easier than using them.

b. Productive Vocabulary

Productive vocabulary is vocabulary that learners can actively use in speaking or writing. Mastery of productive vocabulary requires a deeper understanding, as learners must be able to choose the right words, pronounce them correctly, write them correctly, and use them in the appropriate context.

Uchihara *et al* (2022) show that receptive vocabulary is very important in receptive skills such as reading and listening, while productive vocabulary is essential in productive skills such as speaking and

writing. These two forms of vocabulary complement each other and are equally important for foreign language learners.

In the context of junior high school students, vocabulary problems are not only related to the gap between receptive and productive vocabulary, but also to low vocabulary mastery in general. Many students are unable to recognize and understand English vocabulary well when it appears in written or spoken texts. This condition indicates the need for a more interactive and contextual approach to vocabulary learning.

In line with this, based on the Merdeka Curriculum implemented at state Junior High School 20 Bengkulu city in the academic year 2025-2026, this semester students are studying several topics related to daily life and the environment, namely Chapter 3: Love Our World, Chapter 4: No Littering, and Chapter 5: Embrace Yourself (Damayanti, Nurlaelawati, *et al.*, 2022). These three chapters generally aim to develop students' understanding of various contexts of English language use, including vocabulary relevant to the environment and self-development. Of the three chapters, Chapter 3: Love Our World is the focus of this study because it contains vocabulary related to environmental issues that are close to students' lives, making it easier to

understand contextually. Additionally, this topic provides opportunities for students to develop receptive vocabulary through various meaningful texts and learning activities.

Therefore, this study focuses on improving students' receptive vocabulary with the Assemblr Edu application, which is expected to help students recognize, understand, and remember English vocabulary more effectively.

7. Techniques of teaching vocabulary

Teaching vocabulary is an important part of learning English because vocabulary is the basis for understanding and using the language. Brunner suggests several vocabulary teaching techniques that teachers can use to help students understand, remember, and use vocabulary effectively (Duha, 2024). These techniques can be explained as follows:

a. Contextual Redefinition Strategy

This technique emphasizes understanding the meaning of words through context. Teachers do not directly provide the meaning of words, but guide students to guess the meaning of new vocabulary based on the accompanying sentences, texts, or situations. In this way, students learn to use contextual clues and do not always rely on translations. This technique also

trains critical thinking skills and improves reading comprehension.

b. Exclusion Brainstorming Strategy

This technique is used to activate students' prior knowledge and expand their vocabulary. Students are asked to group several words and determine which words do not fit into a particular category. Through this activity, students learn to understand the meaning relationships between words and reinforce previously learned vocabulary concepts.

c. Predictions, Definitions, and Connections Strategy

This technique aims to determine the extent to which students have mastered vocabulary. Students are invited to predict the meaning of words, compile simple definitions, and connect the vocabulary to learning materials or their experiences. This technique helps students identify unfamiliar vocabulary while enriching their understanding of the meaning and use of words.

d. What's in a Name Strategy

In this technique, teachers guide students in using reference sources such as dictionaries, thesauruses, and glossaries. Students are trained to independently search for word meanings, synonyms, and examples of usage. This technique not only

increases students' vocabulary but also improves their independence in learning and their skills in using learning resources.

e. Word for the Day Strategy

This technique involves introducing one new word each day and encouraging students to use that word in various contexts. Repeated exposure and use of the word help students remember it better and makes it part of their active vocabulary in everyday life.

Based on the vocabulary teaching techniques proposed by Brunner (as cited in Duha, 2024), this study focuses on the application of the Contextual Redefinition Strategy and the Prediction, Definition, and Relation Strategy, as both are best suited for use with the augmented reality-based Assemblr Edu platform. The Contextual Redefinition Strategy enables students to understand the meaning of vocabulary through the presented context, such as 3D object visualizations and situations displayed in Assemblr Edu. Through this technique, students not only memorize word meanings but are also trained to guess and interpret meanings based on visual cues and context, thereby enhancing critical thinking skills and reading comprehension. Meanwhile, the Prediction, Definition, and Connection Strategy encourage students to be more active in the learning

process by predicting word meanings, formulating simple definitions, and connecting vocabulary to their existing experiences or knowledge. The application of this technique aligns with the interactive appropriately in different contexts, thereby optimizing the improvement of students' vocabulary skills.

B. Assemblr Edu Application

1. Definition of Assemblr Edu Application

Assemblr Edu is a learning application that provides interactive Augmented Reality (AR) media in the form of three-dimensional visuals to support the teaching and learning process. This application is designed using digital visual technology, enabling it to present learning objects in a more concrete and engaging manner. Research by Mursyida *et al.*, (2023) indicates that Assemblr Edu has been used as an effective learning medium in classroom activities and serves as a tool to support technology-based learning. Through the AR feature, users can display learning objects in 3D form that can be viewed directly via digital devices. Additionally, this application allows teachers to create their own learning content, which students can then access via AR-based QR codes (Rosyidah *et al.*, 2023), thereby

providing flexibility and ease in accessing contextual materials.

The multimedia features provided by Assemblr Edu are consistent with the Cognitive Theory of Multimedia Learning proposed by (Mayer, 2002) This theory suggests that meaningful learning occurs more effectively when learners receive information through both verbal and visual channels rather than through words alone. The integration of text, images, animations, and three-dimensional objects helps learners process information more efficiently, reduces cognitive overload, and promotes better understanding and long-term memory retention. Therefore, learning media that combine verbal explanations with visual representations can facilitate students in constructing knowledge more meaningfully. Since Assemblr Edu integrates text, images, three-dimensional objects, and Augmented Reality technology, it has the potential to support students in mastering English vocabulary through engaging, contextual, and interactive learning experiences.

The effectiveness of Assemblr Edu has also been supported by several previous studies. (Susanti *et al.*, 2025) found that the visual and interactive learning approach implemented in Assemblr Edu helps students understand abstract concepts more concretely. Similarly,

Majid *et al.*, (2023) reported that most students responded positively to the use of Assemblr Edu because it enhanced their interactive learning experiences and creativity through the use of three-dimensional media. Furthermore, Lissa'adah & Widiyatmoko (2023) demonstrated that AR-based learning media developed with Assemblr Edu significantly improved students' learning interest and academic achievement. In addition, Herwin *et al.* (2023) concluded that the integration of Augmented Reality with interactive elements, such as game-based activities in realistic learning environments, increased students' motivation, participation, and enthusiasm during classroom instruction.

Based on these findings, it can be concluded that Assemblr Edu is an innovative learning tool that is effective in improving the quality of learning. The use of AR technology not only facilitates a deeper understanding of concepts but also enhances student motivation, creativity, and active engagement in the learning process. Thus, Assemblr Edu can serve as a modern learning strategy that aligns with current technological advancements and educational needs.

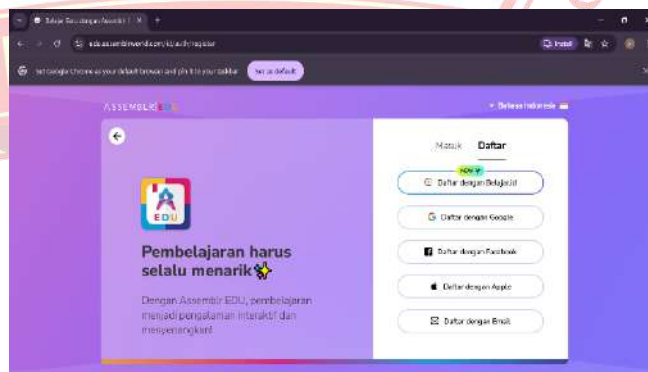
2. Procedure

a. Procedure of designing Material (for teacher)

- 1) To begin, open a web browser and visit edu.assemblrworld.com. Click Register and choose a sign-up method such as Belajar.id, Google, Facebook, Apple, or Email. After completing the registration process, you will be directed to the Assemblr EDU home page, where all your AR projects and learning tools are available.

Figure 1. Assemblr EDU registration page.

- 1) On the home page, you can see several main menus including Home, Learning Materials, Editor, Class, and Guide. The **My AR Projects**



section displays all projects you have created. To start a new AR project.

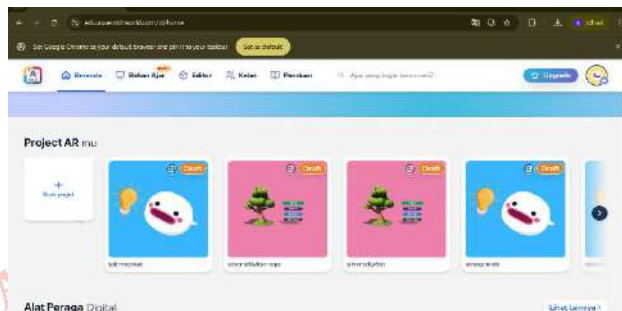


Figure 2. Assemlr EDU home page showing AR projects.

- 1) After entering the editor, you can begin adding 3D objects to your project. Open the **3D Library** and choose a category such as **Foods & Beverages Pack**. From the library, select an object like ramen, rendang, sate, or pizza, and it will automatically appear in your workspace.

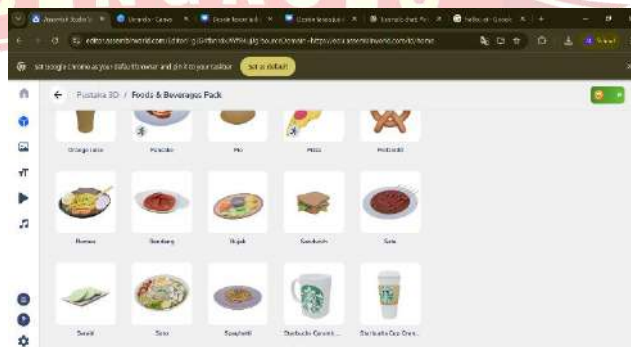


Figure 3. 3D object library in Assemlr EDU.

- 2) Once the object is added, you can adjust it by changing its size, position, and rotation to fit the AR scene. You can also enhance the learning experience by adding text descriptions, labels, audio narration, or interactive elements such as tapping an object to display information. These features help make the AR content more engaging and informative for students

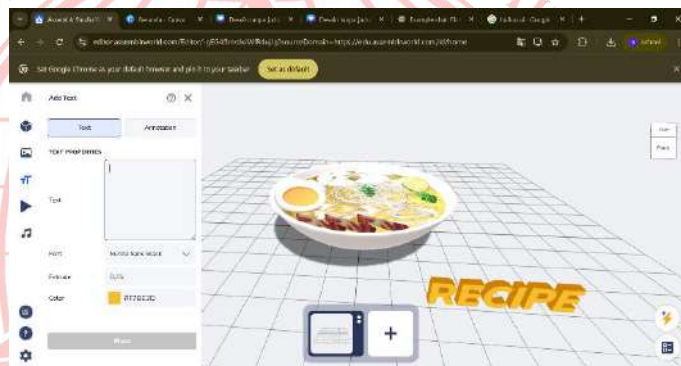


Figure 4. Editor selection page in Assemblr EDU.

- 3) To experience the project in Augmented Reality, click **Preview** or **Play**, then choose **AR Mode**. Using a smartphone or tablet, point the camera at a printed marker or scan a flat surface for markerless AR. The 3D object will appear in the real-world environment on the screen, allowing users to observe it from different angles and distances.

account. The project will be stored as a draft on the home page and can be reopened or edited at any time. You can share the project link with students, use it during classroom lessons, or integrate it into project-based learning activities

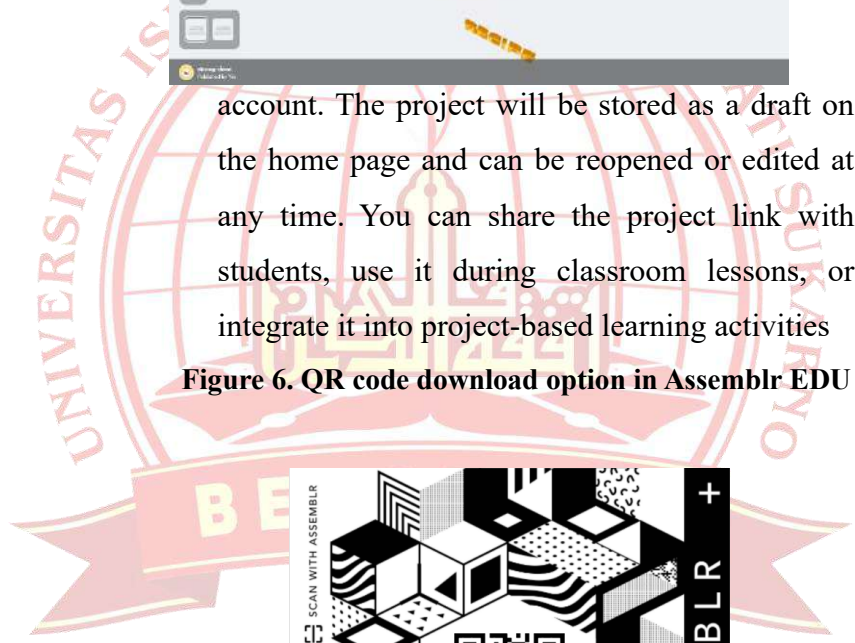
Figure 6. QR code download option in Assemblr EDU

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Figure 6. QR code download option in Assemblr EDU

- 1) In the initial stage, students prepare the devices they will use, such as smartphones with the Assemblr Edu app installed. In addition, an internet connection is required to access the app's features. This stage aims to ensure that the learning process can proceed without technical issues.



Figure 7. Assemblr Edu Application Logo

- 2) App Access, students open the Assemblr Edu app and access the scan or AR camera feature. This feature is a key component of the app that allows users to scan markers to trigger the appearance of virtual objects.



Figure 8. Home Page of the Assemblr Edu Application.

- 3) Scanning Phase, Students point their device's camera at the provided marker. The marker serves as a link between the real world and virtual objects. Once the marker is detected, the app will automatically display the Augmented Reality object.



Figure 9. Marker Scanning Feature in the Assemblr Edu Application

4) Object Visualization Stage, Once the scanning process is complete, the virtual object will appear on the device's screen. The object can be an image, animation, or video relevant to the learning material. Students can view the object directly from various angles.



Figure 10. Interactive 3D Learning Scene in the Assemblr Edu Application

3. Role of Assemblr edu in teaching vocabulary

Vocabulary mastery is one of the fundamental aspects of English language learning because it forms the basis for other language skills, such as reading, writing, listening, and speaking. Therefore, learning media that can help students understand the meaning of words in a concrete and contextual manner is needed. In this case, Assemblr Edu, as an Augmented Reality (AR)-based learning medium, plays an important role in supporting

vocabulary teaching. Assemblr Edu allows students to see three-dimensional objects visually and interactively, so that vocabulary is not only learned verbally, but also through real visual representations. By displaying 3D objects that can be observed from various angles, students can more easily associate words with their form, function, and context of use. This is in line with visual learning theory, which states that information presented visually and concretely is easier for students to understand and remember. In addition, the use of Assemblr Edu can increase student engagement and motivation in vocabulary learning. An interactive and technology-based learning environment makes students more active in exploring the material, compared to conventional learning that relies only on textbooks or teacher explanations.

Students' interest in AR technology can create a more enjoyable learning environment, making the process of mastering vocabulary more effective. Assemblr Edu also plays a role in helping students understand abstract and concrete vocabulary through contextual learning experiences. Teachers can integrate vocabulary into specific virtual situations or environments, allowing students to see firsthand the relationship between words and their contexts of use. This approach supports meaningful learning, as students not only memorize

vocabulary but also understand its use in real life. Thus, Assemblr Edu has a strategic role in teaching English vocabulary, particularly as a medium that combines visualization, interactivity, and AR technology. Although it still has some limitations, the proper use of Assemblr Edu can be an innovative alternative to improve students' understanding and mastery of vocabulary.

a. Teacher role in Assemblr Edu

In implementing Assemblr Edu as an Augmented Reality-based learning medium, the role of teachers is a key factor in the success of the learning process. Teachers not only function as technology users, but also as learning designers who determine the objectives, materials, and vocabulary to be taught through AR media. With careful planning, teachers can ensure that the use of Assemblr Edu is in line with the curriculum and students' learning needs. In addition, teachers act as facilitators during the learning process. The use of Assemblr Edu requires students to interact directly with AR features, which often causes technical problems or operational difficulties. In this situation, teachers provide guidance, direction, and assistance thus the students can use the application appropriately and remain focused on learning objectives, especially in vocabulary mastery. Teachers also have an

important role as motivators in creating an engaging and interactive learning environment. The use of Assemblr Edu can increase student interest and engagement by providing a more visual and contextual learning experience. Through encouragement and proper management of activities, teachers can foster active student participation and increase their confidence in learning English vocabulary.

In addition, teachers act as evaluators who assess the effectiveness of Assemblr Edu in achieving student learning outcomes. Teachers can conduct evaluations through vocabulary tests, written assignments, and oral activities to measure student understanding after AR-based learning. This evaluative role is important to ensure that the use of Assemblr Edu is not only innovative but also has a positive impact on improving students' vocabulary mastery.

b. Student role of Assemblr Edu

In vocabulary learning using Assemblr Edu, students play an active role as the main subjects in the learning process. The use of Augmented Reality-based media encourages students to not only passively receive information but also explore learning materials through direct interaction with three-dimensional

objects. Through activities such as observing, manipulating, and identifying AR objects, students act as active learners who build their understanding of vocabulary independently and meaningfully.

In addition, students act as explorers in a digital learning environment. Assemblr Edu allows students to explore vocabulary in a more realistic visual context, enabling them to connect words with their forms, functions, and usage situations. This role supports contextual learning, where students not only memorize vocabulary but also understand its meaning through visual and interactive experiences. Students also act as problem solvers when faced with technical challenges or AR-based learning tasks.

In this process, students are required to develop independent learning, critical thinking skills, and the ability to adapt to technology. With the guidance of teachers, students learn to overcome difficulties in using the application and maximize the features of Assemblr Edu to support vocabulary comprehension. In addition, students act as collaborators in learning activities. The use of Assemblr Edu can encourage cooperation among students through discussion, sharing findings, and helping each other understand the vocabulary being studied. This interaction not only

improves language comprehension but also develops students' social and communication skills.

4. Advantages of Assemblr Edu

One of the main advantages of Assemblr Edu lies in its ability to present learning content in three dimensions (3D) through its augmented reality feature. This 3D presentation of material provides a more engaging and immersive learning experience for students compared to conventional learning media. This is in line with findings by Hikam *et al.* (2025) , which state that AR-based 3D content presentation has the potential to create a more engaging learning experience and increase student engagement in learning. In addition, Assemblr Edu also provides ready-to-use interactive AR educational content (Chairudin *et al.*, 2023) . The existence of this content makes it easier for teachers to implement technology-based learning without having to create materials from scratch. Another advantage of Assemblr Edu is the ease of use of the application and flexibility in developing learning materials. According to Kheorunnisa, (2025), Assemblr Edu is easy to use and provides unlimited materials, allowing teachers to easily create and customize teaching materials according to learning needs. In addition, this application is equipped with a feature for sharing learning material links, which

makes it easier for teachers to distribute teaching materials to students, especially in online or distance learning.

C. Previous Study

Research on the use of Augmented Reality (AR) in English vocabulary learning is growing rapidly and has been applied in various educational contexts. A relevant national study was conducted by Zulvi *et al.*, (2024), entitled *"Enhancing Students' Vocabulary Mastery through the Assemblr Edu Application Based on Augmented Reality."* This study used a Classroom Action Research (CAR) design involving seventh-grade students of MTs Darul Mukhlisin to improve their vocabulary mastery through the use of the Assemblr Edu application. The results showed a significant increase in students' vocabulary mastery in each cycle. The students' average score increased from 80.6 on the initial test to 90.1 on the post-test of cycle I and increased again to 91.4 on the post-test of cycle II. In addition, the number of students who achieved the Minimum Passing Criteria (KKM) also increased to 100% at the end of the cycle. The questionnaire results showed an increase in students' ability to answer vocabulary questions after using Assemblr Edu. These findings indicate that Assemblr Edu is effective in

improving vocabulary mastery through interactive and visual learning.

Furthermore, research by Kurnia *et al.*, (2025) examined the effectiveness of using AR in teaching English vocabulary to seventh-grade students using a true experimental design. The results showed that the experimental group obtained higher post-test scores (89.00) than the control group (78.56), with an N-Gain value of 63.28% in the experimental group and 5.66% in the control group, and a significance value of $p = 0.000$. These results prove that AR-based learning can significantly improve students' vocabulary mastery.

Different findings emerged in an international study by Belda-medina & Marrahi-gomez (2023) in their article “The Impact of Augmented Reality (AR) on Vocabulary Acquisition and Student Motivation” published in the journal *Electronics*. The study, involving 130 students (64 in the experimental group; 66 in the control group) who studied 30 geographical terms over four weeks, found that although students showed positive attitudes and high motivation toward AR, there were no significant differences between the experimental and control groups in pre-test and post-test vocabulary scores. This study demonstrates that high motivation does not always lead to improved performance if pedagogical design and material quality are not optimal.

Another study by Korosidou (2024) entitled “The Effects of Augmented Reality on Very Young Learners' Motivation and Learning of the Alphabet and Vocabulary” in the Digital journal examined very young learners aged 5.5-6 years. Using a pre-test/post-test design with 26 participants, this study showed that although the control group had higher initial scores, the AR group showed significant improvement in the post-test for phases 2 and 3, especially in long-term retention. These results reinforce the role of AR in improving vocabulary retention in early childhood.

Based on the results of previous studies, it can be concluded that Augmented Reality, particularly through the Assemblr Edu application, has great potential in improving students' vocabulary mastery. However, most previous studies have focused on seventh-grade students, used action research designs, or discussed AR in general. Therefore, there is still a gap in research related to the use of Assemblr Edu with a quasi-experimental design in eighth-grade junior high school students, particularly in public schools. This gap provides a strong basis for researchers to conduct research at Junior High School 20 in Bengkulu City during the 2025–2026 academic year.

D. Theoretical Framework

This study focuses on two main variables that are interrelated, namely:

1. The independent variable (Variable X) in this study is the use of the Assemblr Edu application as a learning medium. This application is used in English learning activities to help students learn vocabulary through visual displays and interactive activities, particularly on vocabulary related to the Environment. The application of the Assemblr Edu application is expected to create a more interesting learning process and make it easier for students to understand vocabulary.
2. The dependent variable (Variable Y) in this study is students' vocabulary mastery. Vocabulary mastery refers to students' ability to understand and use English vocabulary appropriately after participating in learning using the Assemblr Edu application. Changes or improvements in students' vocabulary mastery are used as measurable results to determine the extent of the influence of using the Assemblr Edu application on students' vocabulary skills.

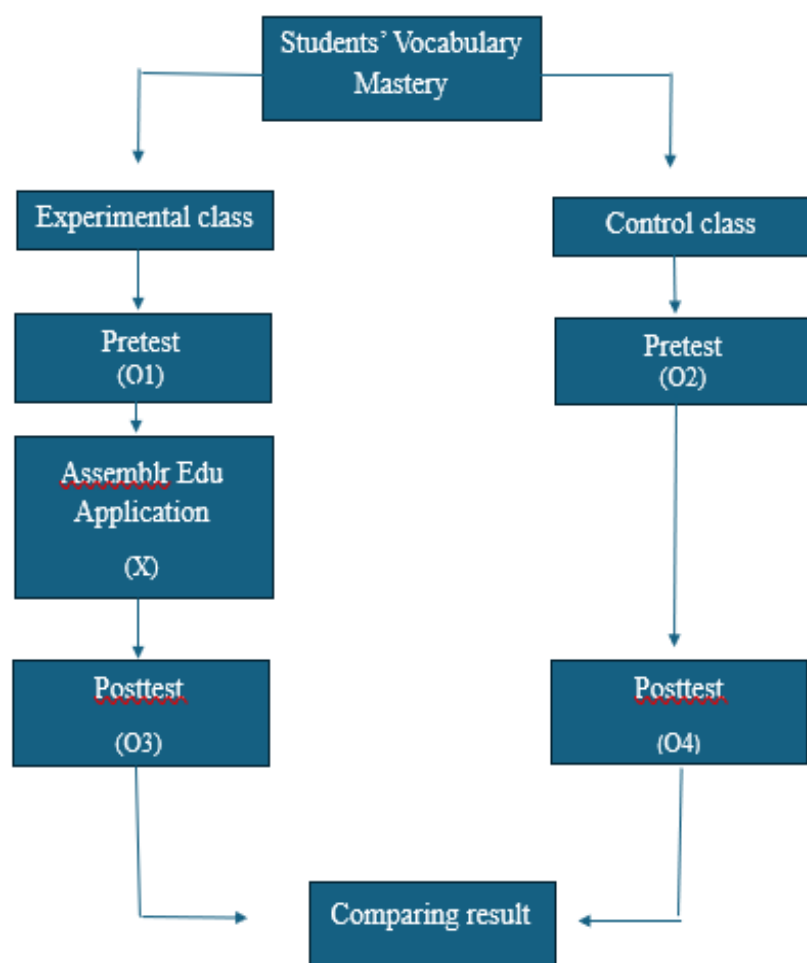


Figure.7 Conceptual Framework

E. Hypothesis

1. Null Hypothesis (H_0): There is no effect of using the Assemblr Edu application on the vocabulary mastery of eighth-grade students at State Junior High School 20 Bengkulu City in the 2025–2026 academic year.
2. Alternative Hypothesis (H_a): There is an effect of using the Assemblr Edu application on the vocabulary mastery of eighth-grade students at State Junior High School 20 Bengkulu City in the 2025–2026 academic year.

