

CHAPTER I

INTRODUCTION

This chapter opens the discussion by laying out how the study is organized, starting with the research background and moving through the research questions, objectives, and significance. It also sets out the boundaries of the previous study, the conceptual framework guiding the analysis, the hypotheses being tested, and a short look at studies that came before this one and shaped its direction.

A. Research Background

Vocabulary is an important part of English learning because it supports learners in understanding information, expressing ideas, and communicating effectively. In EFL learning, sufficient vocabulary knowledge is needed to support the development of listening, speaking, reading, and writing skills (Brown, 2007; Nation, 2013; Schmitt & Schmitt, 2020). However, learners need more than general vocabulary when English is used for a particular field of study. Technical vocabulary consists of specialized terms used in specific disciplines and professions, and its mastery helps learners understand subject related concepts and communication (Nation, 2013). In ESP, language learning is expected to reflect learners' actual needs and areas of specialization (Hutchinson & Waters, 1987; Dudley Evans & St John, 1998). Therefore, technical vocabulary is particularly important for vocational students who need English that is relevant to their future academic and professional activities.

This need is especially important in vocational education because students are expected to develop practical competencies while preparing for future careers. English learning in vocational schools should help students communicate in wider settings and respond to global challenges while remaining connected to the characteristics of their study programs (Haryadi & Aminuddin, 2023; Suparyati et al., 2023). However, when English instruction gives greater attention to general language than to field specific terminology, students may have limited opportunities to develop the vocabulary required in their vocational subjects.

A similar problem was identified in the Visual Communication Design (VCD) program at SMK Tarbiyatul Aulad Cikajang. Based on the researcher's preliminary observation, many students had difficulty understanding English technical terms related to design software and digital media. Students frequently relied on translation applications or asked classmates when they encountered unfamiliar terms during classroom activities. Although they had developed practical design skills through their vocational subjects, they still experienced difficulties when technical terminology was presented in English. This condition suggests a need for English learning activities that connect vocabulary development with the students' actual vocational context.

The problem was also confirmed through a preliminary interview with the English teacher of the VCD program in April 2026. The teacher explained that students often experienced difficulties in understanding English instructions and learning materials because of limited vocabulary knowledge, particularly terms related to their field of study. This difficulty may affect students' ability to follow English based instructions and participate effectively in vocational learning activities. Since vocabulary learning becomes more meaningful when students repeatedly encounter and use new words in contextualized activities, Clenton and Booth (2020) and Nation and Richards (2017) emphasize the importance of providing opportunities for meaningful vocabulary practice rather than relying only on memorization or translation. Therefore, learning activities that allow students to encounter, practice, and apply technical vocabulary in contexts related to their field are needed.

One possible way to provide such learning experiences is through the use of Artificial Intelligence (AI). AI based learning tools can provide explanations, immediate feedback, and opportunities for independent learning, while also supporting learner engagement and flexible learning experiences (Kristiawan et al., 2024; Luckin et al., 2016; Nurfazri et al., 2026). These functions are relevant to the problem identified in the VCD program because students can receive assistance when they encounter unfamiliar technical terms. One AI based application that provides these types of support is Dola AI, previously known as CICI AI. It offers

features such as vocabulary explanations, interactive conversations, pronunciation practice, and image generation. The vocabulary explanation and interactive conversation features can help students understand unfamiliar technical terms and explore their use, while the image generation feature can connect technical terms with visual representations. This combination is particularly relevant to VCD students because visual and verbal information can support understanding of new concepts (Mayer, 2002). Therefore, the features of Dola AI are relevant to this study because they support the learning of technical vocabulary that is measured through students' vocabulary mastery before and after the treatment.

Previous studies also provide evidence that AI can support vocabulary learning. AI chatbot applications have been reported to help students develop vocabulary through interactive practice and immediate responses (Oktadela et al., 2023), while AI chatbots have also supported autonomous learning and the mastery of specialized vocabulary among nursing students (Mohamed et al., 2026). In addition, AI generated visual support has been found to strengthen vocabulary retention by helping learners connect words with meaningful representations (Fannoni et al., 2023). Although these findings show the potential of AI for vocabulary learning, the studies were conducted in different educational contexts and did not specifically address technical vocabulary learning among VCD students in vocational high schools.

The research gap therefore lies in the limited evidence concerning the use of an AI tool that combines interactive vocabulary support and visual features to develop technical vocabulary in vocational VCD education. Previous research has examined AI in general EFL vocabulary learning, speaking and writing, as well as specialized vocabulary in fields such as nursing (Briones et al., 2025; Muthmainnah, 2024; Oktadela et al., 2023; Mohamed et al., 2026), but the use of Dola AI for technical vocabulary mastery among vocational VCD students has not been specifically examined. In response to this gap and the vocabulary difficulties identified at SMK Tarbiyatul Aulad Cikajang, this study investigates the effectiveness of Dola AI in enhancing technical vocabulary mastery among

eleventh grade VCD students. The study is expected to provide practical insight into the use of AI assisted vocabulary learning in vocational English education.

B. Research Questions

From the background explained above, the research questions of this study are formulated as follows:

1. What is the level of students' technical vocabulary mastery before the use of Dola AI?
2. What is the level of students' technical vocabulary mastery after the use of Dola AI?
3. Is there a significant difference in students' technical vocabulary mastery before and after being taught using Dola AI?

C. Research Purposes

Referring to the research questions stated above, the objectives of this study were formulated as follows:

1. To identify the level of students' technical vocabulary mastery before the use of Dola AI.
2. To identify the level of students' technical vocabulary mastery after the use of Dola AI.
3. To examine whether there was a significant difference in students' technical vocabulary mastery before and after being taught using Dola AI.

D. Research Significances

The findings of this study were expected to provide both theoretical and practical contributions in the field of English language teaching, particularly in vocational education and English for Specific Purposes (ESP) contexts.

1. Theoretical Significance

From a theoretical perspective, this study was expected to contribute to the existing body of knowledge on vocabulary acquisition and AI-assisted language learning. By focusing on technical vocabulary mastery among vocational high school students, this study provided insights into how AI-based tools could support vocabulary learning in a more contextualized and meaningful way. This study also supported the view that vocabulary learning becomes more effective when learners

are exposed to repeated input and meaningful use in context, as suggested in vocabulary acquisition theory (Nation, 2013). In addition, the findings were expected to enrich the discussion on the integration of Artificial Intelligence in language learning, particularly in ESP settings where technical vocabulary plays a crucial role.

2. Practical Significance

Practically, this study was expected to provide useful insights for teachers, students, and future researchers. For teachers, the findings could offer an alternative approach to teaching technical vocabulary by integrating Dola AI into classroom instruction, particularly through the use of visual support, pronunciation features, and contextual explanations that may enhance students' understanding. For students, the use of Dola AI was expected to create a more flexible and engaging learning experience, allowing them to practice technical vocabulary independently and better understand unfamiliar terms related to Visual Communication Design. In addition, this study could serve as a reference for future researchers who are interested in exploring the use of AI-assisted tools in different educational contexts, fields of study, or language skills beyond technical vocabulary mastery.

E. Research Scope

This study focused on examining the use of Dola AI as an AI-assisted learning tool in improving students' technical vocabulary mastery in English learning. The participants of this study were 11th-grade students from the Visual Communication Design program at SMK Tarbiyatul Aulad Cikajang, Garut, West Java, Indonesia. The study specifically focused on students' technical vocabulary related to visual communication design, including digital media terminology, basic design concepts, and common commands used in design software during classroom learning activities. This research was conducted within the framework of English for Specific Purposes (ESP), which emphasizes language learning that is closely related to students' vocational needs. By limiting the study to a specific group of students and a particular learning context, this research aimed to provide a focused

understanding of how Dola AI supported technical vocabulary learning in vocational English classrooms.

F. Conceptual Framework

This study was grounded in several theoretical perspectives that explained how vocabulary learning could be effectively developed, particularly in vocational and technology-supported contexts.

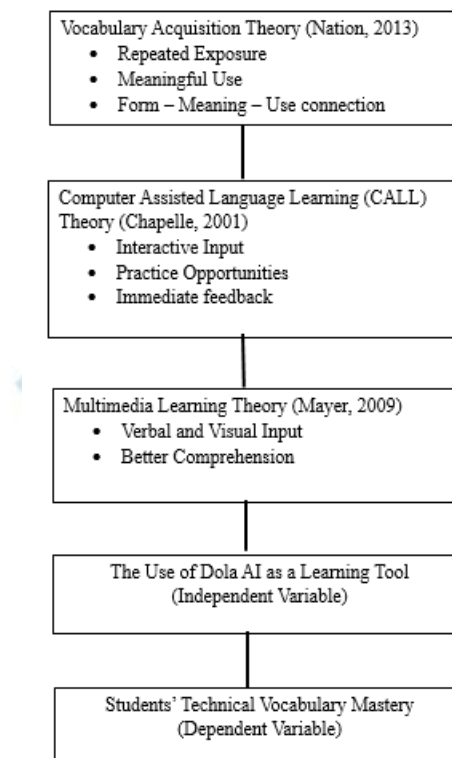


Figure 1. 1 Conceptual Framework

One of the main theoretical foundations of this study was Vocabulary Acquisition Theory proposed by Nation (2013), which emphasized that vocabulary mastery develops through repeated exposure, meaningful use, and the integration of word form, meaning, and use. In the context of English for Specific Purposes (ESP), this theory highlighted the importance of technical vocabulary in helping learners understand field-related materials and perform tasks relevant to their vocational area. Without sufficient exposure and contextual use, learners often experienced difficulties in applying vocabulary effectively in real situations.

To further explain the role of technology in language learning, this study also drew on Computer-Assisted Language Learning (CALL) theory proposed by Chapelle (2001). CALL theory emphasized the importance of interactive input, learner autonomy, opportunities for practice, and immediate feedback in supporting language acquisition. Through technology, learners were able to engage more actively with learning materials, practice independently, and receive support beyond classroom limitations. These principles were relevant to the use of AI-assisted tools, such as Dola AI, which provided interactive features that could support vocabulary learning in a more flexible and student-centered way.

In addition, this study incorporated principles from Multimedia Learning Theory proposed by Mayer (2009), which suggested that learning becomes more effective when information is presented through both verbal and visual forms. The combination of words and images allowed learners to process information more efficiently and improved retention. In the context of this study, the visual features provided by Dola AI were assumed to help students connect technical terms with their visual representations. This was particularly relevant for students in the Visual Communication Design program, who were accustomed to learning through visual materials and digital media.

Based on these theoretical perspectives, Dola AI was positioned as the independent variable, while students' technical vocabulary mastery was treated as the dependent variable. The integration of interactive learning and visual support through Dola AI was assumed to facilitate better vocabulary learning experiences, which in turn could improve students' technical vocabulary mastery. Therefore, this conceptual framework illustrated that the use of Dola AI as an AI-assisted learning tool had the potential to positively influence students' vocabulary mastery in an ESP-oriented vocational context.

G. Research Hypotheses

In quantitative research, hypotheses were formulated as testable statements that predicted the possible relationship or difference between variables and were examined through statistical analysis (Creswell, 2014). In line with the research

objectives and the use of a pre-experimental design, this study proposed the following hypotheses:

1. H0 (Null Hypothesis): There was no significant difference in the technical vocabulary mastery of Visual Communication Design students at SMK Tarbiyatul Aulad Cikajang before and after the use of Dola AI.
2. H1 (Alternative Hypothesis): There was a significant difference in the technical vocabulary mastery of Visual Communication Design students at SMK Tarbiyatul Aulad Cikajang before and after the use of Dola AI.

H. Previous Studies

This part presents earlier studies related to this research. These studies give useful ideas about how AI has been used in learning English, and they help show the gap that this study tries to fill.

The first study was conducted by Muthmainnah (2024) entitled “*AI-CiciBot as Conversational Partners in EFL Education.*” This research looked at how AI chatbots were used as conversation partners to support English learning, particularly in improving students’ speaking performance and reducing speaking anxiety. The result showed that talking with AI made students feel more confident and speak more smoothly. However, the study mainly focused on speaking skills in a general EFL context and did not examine vocabulary mastery, especially technical vocabulary in vocational or English for Specific Purposes (ESP) learning.

The second study was conducted by Briones et al. (2025) entitled “*Artificial Intelligence-Assisted Learning Focusing on CICI Usage.*” This study examined the implementation of AI-assisted instruction to improve students’ writing performance. The findings indicated that the use of CICI AI contributed positively to students’ lexical choice, language accuracy, and overall writing quality. Nevertheless, vocabulary development was not the primary focus of the research, and the study did not specifically investigate technical vocabulary or vocational high school students.

The third study was conducted by Oktadela et al. (2023) entitled “*Improving English Vocabulary through Artificial Intelligence (AI) Chatbot Application.*” This study explored the effectiveness of AI chatbot applications in improving students’

English vocabulary. The findings revealed that students' vocabulary mastery improved after learning with AI chatbots because they were able to interact repeatedly with unfamiliar words, receive immediate feedback, and practice vocabulary more independently. However, the study focused on general English vocabulary and did not specifically examine technical vocabulary related to vocational education or ESP contexts.

The fourth study was conducted by Mohamed et al. (2026) entitled "*The Role of AI Chatbots in Nursing Students' Autonomous Learning in Mastering Medical Vocabulary: A Quasi-Experimental Study.*" This research checked how well AI chatbots helped nursing students learn medical terms on their own. The finding showed that learning with AI support clearly improved students' grasp of specialized words because it gave fast explanations, ongoing interaction, and room to practice independently. Although this study focused on specialized vocabulary, it was conducted in nursing education rather than vocational high schools and examined medical terminology instead of technical vocabulary related to Visual Communication Design.

The fifth study was conducted by Fannoni et al. (2023) entitled "*The Use of the DALL-E Artificial Intelligence Platform for Vocabulary Learning.*" This research looked at how AI-made pictures could support vocabulary learning. The result showed that images generated by AI helped learners connect words with their meanings more strongly, which made new words easier to remember. However, the study focused on general vocabulary learning and did not specifically investigate technical vocabulary in vocational or ESP-oriented learning.

Based on the review of these previous studies, Artificial Intelligence has shown positive contributions to English language learning, including speaking, writing, general vocabulary, and specialized vocabulary learning. Studies by Muthmainnah (2024), Briones et al. (2025), and Oktadela et al. (2023) examined the use of CICI AI, which is now known as Dola AI, for different aspects of English learning, while Mohamed et al. (2026) focused on specialized vocabulary through AI chatbot use in nursing education. However, these studies did not examine the use of Dola AI for technical vocabulary learning among vocational high school students in a

Visual Communication Design program. The existing studies also addressed different learning focuses, such as speaking, writing, general English vocabulary, and medical vocabulary, rather than technical vocabulary in VCD. Therefore, this study seeks to fill this gap by investigating the effectiveness of Dola AI in improving technical vocabulary mastery among eleventh-grade students of the Visual Communication Design program at SMK Tarbiyatul Aulad Cikajang.

