

CHAPTER I

INTRODUCTION

This chapter presents the background of the study, the problem statement, the research questions, the research objectives, the significance of the study, the scope and limitations of the research, the originality of the research, and the operational definition of key terms. It provides the initial foundation and contextual urgency for conducting this research study.

A. Background of the Study

The development of digital technologies has brought about some changes in education, among them learning of languages. The use of technologies like Virtual Reality (VR) and interactive multimedia has gradually become an integral part of 21st-century education, where contextual, interactive, and student-centered learning is emphasized (Cabrera-Duffaut et al., 2024; Huang et al., 2022). While changing the way instructional material is presented, these developments have provided learners with a chance to have more authentic learning experience in order to gain knowledge. In the sphere of global education, reading literacy is viewed as the basic foundation for successful academic performance and developing problem-solving skills. Thus, improving reading skills is one of the main concerns in educational improvement (OECD, 2023).

However, the reading literacy levels of students in Indonesia remain relatively low. The findings of the Programme for International Student Assessment (PISA) 2022 indicate that the reading performance of Indonesian students continues to be below the OECD average. This condition indicates that many students still have difficulty in understanding, evaluating, and reflecting on the information contained in the text. These findings show that high-level thinking skills in reading have not been developed optimally, so learning innovations are needed that can increase student engagement while supporting reading comprehension more effectively (OECD, 2023).

In the realm of acquiring English as a foreign language, there is one ability called reading comprehension that students need to acquire. This ability includes the understanding of the literal meaning of the text, understanding of the main idea, identification of details, inference, vocabulary understanding in the context, and the meaning of the whole text. Grabe and Stoller (2020) define reading comprehension as a complex process arising from the interconnection of linguistic competence, cognitive processes, and the knowledge of the reader in constructing text meaning. There are many types of texts that should be analyzed by students in senior high school, and one of them is the descriptive text that helps to describe a person, a place, an animal, or an object thoroughly to create an accurate mental picture of it (Saifudin et al., 2020).

However, in classroom practice, many students continue to experience difficulties in identifying the main idea, distinguishing between key and supporting information, understanding vocabulary in context, and deriving meaning from the text, resulting in less-than-optimal reading comprehension skills (Ramadhianti & Somba, 2023). This condition indicates that students still struggle to construct mental representations of the reading content, even though this ability is an important aspect of comprehending descriptive texts. Based on the learning conditions observed in one senior high school, reading instruction is still largely dominated by the use of textbooks, while the integration of technology-based learning media that facilitates material visualization remains limited. Consequently, students have fewer opportunities to engage in interesting and contextual learning experiences, leading to relatively low participation in the learning process and affecting the development of their reading comprehension.

This condition shows the need for more innovative use of learning media. One of the media that has the potential to support reading learning is *360-degree VR videos*, which are able to present an immersive learning experience through increased presence and student involvement in the learning process (Makransky & Petersen, 2021). In this study, the 360-degree VR videos are obtained from the YouTube platform and presented in the classroom through an interactive smartboard. Consistent with this, Huang et al. (2022), in their systematic review, reported that the integration of

Augmented Reality (AR) and Virtual Reality (VR) technologies in language learning can enhance student engagement, motivation, and learning outcomes by providing a more interactive and immersive learning experience. The potential use of *360-degree VR videos* in reading learning is supported by its characteristics that are able to provide a realistic and contextual learning environment. Through this medium, which is displayed class-wide on a smartboard, students not only read the text passively, but can also relate the information in the reading to the visualizations observed directly.

The use of 360-degree Virtual Reality (VR) videos can help students understand teaching materials in a better way through concrete visualization based on the assumption made by Cabrera-Duffaut et al. (2024). The theoretical underpinning for the effectiveness of using 360-degree VR videos is rooted in Mayer's (2009) theory of multimedia learning which suggests that learning will be more effective if information is delivered through verbal-visual form. The assertion above is supported by Paivio's (1986) theory of dual coding whereby processing of information through verbal and visual systems at once increases understandability and memorability. Therefore, the use of 360-degree VR videos has the potential to aid students in creating mental representation of descriptive text materials, thus enhancing reading comprehension. Even though there are various studies indicating the potential benefits of using Virtual Reality (VR) in language learning, the use of VR is mostly aimed at improving speaking skills and verbal communication among students.

Based on Parmaxi (2023) systematic review on Virtual Reality, it is evident that most of the literature on VR in language learning focuses on communication-based activities, such as conversation practice and improvement of interaction skills, while research works on the use of 360-degree VR videos in improving students' reading comprehension, especially of descriptive texts at the senior high school level, are relatively few. Based on previous literature, some gaps of research need to be further explored. First, the context gap refers to the lack of researches concerning the application of 360-degree VR videos in reading instruction in Indonesian senior high schools. Thus, previous findings may not be easily generalizable to the students in

Indonesia. Second, the methodological gap involves the lack of experimental researches in which non-parametric comparative analyses have been employed. The comparison here is between classes using VR and classes with traditional learning. Third, the measurement gap involves the lack of studies that measure reading comprehension using certain indicators such as understanding the main idea, looking for details, inferring meaning of vocabularies, and making inference from descriptive texts.

This gap makes it necessary to conduct further studies to provide empirical data concerning the comparison of students' learning results connected with using this innovative technology. Therefore, the current study was carried out in order to examine the efficiency of 360-degree VR videos by comparing the reading comprehension of descriptive texts of senior high school students who were taught with 360-degree VR videos and those who were taught through traditional approaches. It is expected that the results of the study will be theoretically valuable to further develop multimedia-based learning with a special focus on Virtual Reality applications in reading lessons. In addition, from the practical perspective, this study will also provide an alternative source for teachers to choose more innovative and effective media for improving students' reading comprehension skills.

B. Problem Statement

The problems underlying the implementation of this research are the following. First, students' reading comprehension of descriptive texts is not very effective. Learners face difficulties while identifying main ideas, finding details, comprehending vocabulary in context, and making inferences based on the information given in the text. The above-mentioned points are evidence of the necessity of implementing new strategies and learning media into current reading instruction to facilitate the improvement of reading comprehension (Grabe & Stoller, 2020). Moreover, current instructional techniques implemented in schools are mostly based on textbooks and there is no optimization of technology-based learning media for visualization of material.

In such a way, there is not much opportunity for students to get involved in interactive and contextual learning. At the same time, the use of VR-based media can make learning more engaging and improve learning results (Makransky & Petersen, 2021; Cabrera-Duffaut et al., 2024). However, most research studies concerning the application of VR in language learning have a focus on speaking and verbal communication. Research studies dedicated to using 360-degree VR videos for improving reading comprehension skills, especially of descriptive texts for senior high school students are rather rare (Parmaxi, 2023).

Moreover, there is little research that is experimental and makes comparisons between reading comprehension skills of students who study using 360-degree VR videos and conventional techniques. Due to the above-mentioned problems, the purpose of the present research is to assess the effectiveness of using 360-degree VR videos by comparing reading comprehension skills in descriptive texts between students who learn using 360-degree VR videos and conventional methods.

C. Research Questions

In accordance with the background of the study and the identified problem, this research focuses on examining the effectiveness of 360-degree VR videos in enhancing senior high school students' reading comprehension of descriptive texts. Accordingly, the research question is formulated as follows:

- Is there a significant difference in reading comprehension skills in descriptive texts between students who are taught using 360-degree VR videos and students who are taught using conventional methods?

D. Objectives of the Study

Based on the research problem, the purpose of this study is to find out if there is a statistically significant difference in the reading comprehension of descriptive texts among students who learn via 360-degree VR videos and students who are taught in a traditional way.

E. Significance of the Study

1. Theoretical Significance

This study will be valuable not only in the theoretical aspect but also in terms of the development of English Language Education and technology-based learning. It is expected that the results of this research will expand the body of literature about using 360-degree VR videos to promote the reading comprehension of descriptive texts and to prove the Cognitive Theory of Multimedia Learning (Mayer, 2009) and Dual Coding Theory (Paivio, 1986). Furthermore, the research will be useful for future research on the usage of Virtual Reality technology in language education.

2. Practical Significance

From the practical point of view, the study is expected to have value for many participants. Teachers will be able to apply the results of this study when choosing innovative learning media, namely 360-degree VR videos, as well as designing a reading instruction strategy that can be interesting and context-rich. For students, this type of learning is expected to increase their reading comprehension skills, especially the reading comprehension of descriptive texts because of its visual and interactive nature. Educational institutions will be able to develop technology-based learning programs. Lastly, this research can be used by future researchers as a reference or a base for replication on the topic.

F. Scope and Limitations of the Research

There are several limitations of this study, which include a focused scope of the research and proper interpretation of the results found. First, the methodology of this research is limited by the use of the quantitative research design and quasi-experimental design, limiting the analysis to only one independent variable, namely 360-degree VR videos, and one dependent variable, namely reading comprehension skills. Thus, such factors as motivation, interests, learning style and learning environment of students were not taken into account in this study. In relation to the temporal scope, this investigation was carried out for a relatively short period, and therefore, the results

reflect reading comprehension of students only at the time of the experiment and do not allow assessing the impact of using the learning medium in the long run.

Concerning the research sample, there were 18 students in the experimental group and 24 in the control group, so the groups were unequal. Moreover, in this case, students were allocated based on intact classes rather than randomly assigned individually. Such non-equivalent quasi-experimental design does not entirely exclude the possibility of the influence of students' ability differences and other differences between groups on the results of the research. Therefore, this limitation should be considered when interpreting the findings.

Scope and material limitation of this study relates to the fact that it is limited to senior high school students and descriptive texts only. Finally, concerning the data sources, this study used only primary data collected with the help of reading comprehension test. Even though the research instrument was tested for validity and reliability, the values of the Cronbach's alpha coefficients for the pretest (0.630) and posttest (0.533) are lower than the acceptable value of 0.70.

G. Originality of the Research

The utilization of Virtual Reality (VR) technology in the language education setting has become an increasingly popular field of interest in academic research in recent times. There exists quite a lot of literature proving that VR can contribute to the improvement of the students' motivation and learning performance by providing them with immersive learning experience (Cabrera-Duffaut et al., 2024; Makransky & Petersen, 2021; Huang et al., 2022). It implies that VR technology has great potential in language education to make it interactive, contextualized, and learner-centered. However, the existing research reveals a number of drawbacks leading to the formation of research gaps. First, with regard to the language skills, the majority of studies on VR technology usage focuses on the development of speaking skill and interaction, whereas reading comprehension has not yet been studied enough (Parmaxi, 2023).

Second, with respect to methodology, few empirical studies investigate the impact of 360-degree VR videos on reading comprehension. It means that more research should be conducted within experimental framework to prove the effectiveness of this medium in reading instruction, particularly reading comprehension at the senior high school level. Finally, most previous studies have been performed in non-Indonesian settings or at the tertiary level of education and have focused on simulation-based VR requiring complex and expensive hardware (Radianti et al., 2020; Parmaxi, 2023). Contrary to it, there exists few researches on 360-degree VR videos usage as a more applicable and affordable instruction medium for senior high school settings. This study is based on such theories as Cognitive Theory of Multimedia Learning (Mayer, 2009) and Dual Coding Theory (Paivio, 1986) stating that combining verbal and visual information enables mental representation creation and increases comprehension of the reading material. Although these theories have been widely used in multimedia research, few studies were performed using both of them on the issue of 360-degree VR videos for teaching reading comprehension of descriptive text.

With regards to the research gaps discovered through the systematic review process, this study has proposed a number of innovative contributions. On the conceptual front, it integrates the concept of 360-degree virtual reality (VR) videos with the Cognitive Theory of Multimedia Learning and the Dual Coding Theory for improving the teaching of descriptive text reading comprehension. As far as methodology is concerned, the study adopts a quasi-experimental design where the use of the non-parametric Mann-Whitney U test, along with effect size analysis, is made to measure the difference between the experimental and control groups. On the measurement side, the tool measures four fundamental aspects of reading comprehension which include main idea identification, detail location, vocabulary in context interpretation, and inference. As far as the research context is concerned, the study uses 360-degree VR videos for teaching descriptive text reading comprehension at the senior high school level in Indonesia.

H. Operational Definitions of Key Terms

- **360-Degree VR Videos:** In this study, 360-degree virtual reality videos imply an immersive multimedia learning technology derived from the AirPano VR YouTube channel and displayed on an interactive smartboard in the classroom. It is the instructional media used for teaching in the experimental group, and the use of which provides students with the opportunity to interactively explore the descriptive text visualizations from different angles and, therefore, facilitates a more contextual and interactive learning process that conforms to the Cognitive Theory of Multimedia Learning.

- **Reading Comprehension Skills:** In this study, reading comprehension skills imply the ability of students to understand, analyze, and derive the meaning of written text. It is measured in four ways in the present study by such indicators as identification of the main idea, obtaining details, understanding vocabulary in context, and making inferences.

- **Descriptive Text:** In this study, descriptive text implies the English text genre taught to senior high school participants. It is a genre of writing that describes some specific person, place, or thing in a detailed manner so that the students can have a clear image of the object being described.

- **Conventional Methods:** In this study, conventional methods imply the traditional approach to teaching that is used in the control group. It is a teacher-centered instructional technique that makes use of printed textbooks and teacher's explanation of the material in combination with a standard whiteboard without use of immersive VR technology.

- **Quasi-Experimental Design:** In this study, quasi-experimental design implies a quantitative research methodology that is utilized in order to assess the effectiveness of the independent variable (360-degree VR videos) in comparison with the conventional teaching method in terms of students' reading comprehension.

Comparative assessment of the two groups is conducted using the non-parametric statistical technique Mann–Whitney U test.