

CHAPTER I

INTRODUCTION

This chapter draws general information of study which covers explanation about background of the study, research questions, purposes of the study, and scope of the study, the significance of study, definitions of key terms and state of the arts.

1.1 Background of Study

Microlearning has emerged as a prominent approach in education, especially in response to the challenges posed by the COVID-19 pandemic (Herawati et al., 2022). Additionally, based on Asian Development Bank, the pandemic has disrupted our daily lives, particularly in terms of teaching and learning processes, leading to learning loss among students in Indonesia due to school closures. Indonesia's Human Capital Index for 2020 reflects a learning gap of 7.83 years. To address this, various learning materials in digital formats were tested and adapted during the pandemic to mitigate the learning loss. Consequently, there is an urgent need for digital learning materials with a microlearning-based approach, particularly for English learning, as highlighted by Iskandar et al. (2023) and Wahyudi (2021). However, Sulistyaningrum et al. (2023) argue that current digital learning materials, especially for English learning, do not sufficiently incorporate microlearning principles.

Microlearning has gained significant recognition as an effective approach in education, allowing learners to maximize small pockets of time for learning activities (Gao & Zheng, 2020; Hamilton et al., 2021; Hein et al., 2021; Huang &

Liaw, 2018; Kustandi et al., 2020). By enabling increased time on task and supporting anytime anywhere learning, microlearning has become prevalent in the design of learning materials (Hung & Zhang, 2011). This approach is learner-centered, providing individualized and flexible opportunities for engagement through various digital formats such as texts, visual images, audio, video, virtual reality, interactive multimedia, hardware technologies, and software (Allela, 2019; Yuniarsih et al., 2022). The breakdown of content into smaller chunks allows for on-demand learning, seamlessly integrated into learners' everyday routines, and promoting a broad range of interactive activities (Santosa et al., 2022). Hence, microlearning optimizes learning by utilizing various digital formats, allowing learners to engage in on-demand and flexible learning activities.

Recent literature, as noted by Khong and Kabilan (2020), highlights the significance of technology, content, and learner in defining microlearning. This approach is closely linked to mobile and digital technologies, emphasizing the design and development of micro-content and activities. The individual learners, including their attention span and motivation, play a central role in the modern conceptualization of microlearning. Ultimately, microlearning can be delivered through diverse formats to effectively motivate learners in the teaching and learning process.

The learning effects of microlearning have been extensively studied, and the findings consistently demonstrate its positive impact on the learning process (Jahnke et al., 2019; Bruck et al., 2012). Fang (2018) highlights its advantages in college English teaching, addressing challenges such as limited class time, large class sizes, and diverse student needs. Mohammed et al. (2018) further

emphasized its role in facilitating comprehension, long-term retention, and overcoming learning boredom caused by the pandemic. Overall, microlearning significantly improves learners' knowledge, motivation, engagement, performance, and retention, with the support of various information and communication technologies.

Virtual or augmented reality (VR/AR) technologies are emerging as innovative forms of learning that incorporate short and concise content (Santos et al., 2016; Horst and Dörner, 2019; Yuniarsih et al., 2022). Prior research has explored the integration of microlearning principles with VR technology in foreign language instruction (Peixoto et al., 2019). However, the number of publications focusing on VR in the language discipline remains relatively limited, with only thirteen out of 157 papers delving into this area (Luo et al., 2021). These papers predominantly examine the advantages of implementing VR in English education, VR applications that facilitate language learning, and student perceptions of using VR to enhance critical thinking skills (Alfadil, 2020; Tai et al., 2020; Xie et al., 2019; Paradina, 2018; Lee et al., 2019; Klimova, 2021; Luo et al., 2021; Ma, 2021). Therefore, there is untapped potential for further exploration and development of microlearning-based learning materials in the context of VR.

Despite the effectiveness of microlearning in learning materials, it is important to consider its limitations. Fitria (2022) highlights that microlearning-based materials offer only small pieces of information, which may hinder learners from gaining a complete understanding of the content. If the learning materials fail to establish connections and coherence among the sub-topics, learners can become confused. Therefore, it is crucial to provide clear instructions in

microlearning-based materials to support learners and facilitate their comprehension.

Yuniarsih et al. (2022) claimed that when designing microlearning, teachers should have focused on teaching creativity, critical thinking, and problem-solving to their learners to develop their higher-order thinking abilities. It was proven that microlearning-based learning material could be an effective method for motivating learners to learn on their own and with engaging microlearning object materials (Allela, 2021). Learners might have been able to think creatively and critically. Aligned with that, the curriculum in Indonesia (Kurikulum Merdeka Belajar) aimed to make learners have critical thinking skills (Kurniawan et al., 2020). Critical thinking skills are defined as a disciplinary process that was intellectually active and skilled at remembering, understanding, applying, analyzing, evaluating, and creating the information gathered, having six skill stages (Enis, 2011; Sunhaji et al., 2020; Anderson and Krathwohl, 2001).

Furthermore, Asad et al. (2021) have uncovered that out of 26 articles exploring virtual reality (VR) as a pedagogical tool, VR has been found to enhance critical and rational thinking skills within a shared environment. This improvement can be attributed to the ability of VR to simulate object manipulation in a virtual setting that closely resembles the real world. Studies conducted at a university in Yogyakarta (Ikhsan et al., 2020) and several senior high schools in Banjarmasin (Mahdian et al., 2021) have provided evidence of a significant enhancement in learners' critical thinking skills when utilizing VR learning materials as part of their learning process. These learning materials infused critical thinking into the activities within the VR environment, with

learners demonstrating their critical thinking abilities by presenting well-supported arguments in response to existing problems. Unfortunately, in Indonesia, VR learning materials primarily focus on the science field and are limited in their application to language learning, particularly English.

The need to create English learning materials that align with learners' requirements has become increasingly urgent. To address the challenges faced by English language learners (ELLs) in the post-pandemic era, the use of microlearning-based approaches, coupled with microlearning object materials, has been proposed (Fedorova et al., 2022; Leong et al., 2021). Research indicates that microlearning content design ranks as the second most extensively studied topic, with 13 out of 53 publications dedicated to it (Sankaranarayanan et al., 2022). Additionally, Yuniarsih et al. (2022) suggest that teachers should develop captivating learning materials that stimulate critical thinking and encourage learners to engage deeply. Therefore, the design of microlearning-based English learning materials must incorporate suitable learning objects and integrate at least one cross-curricular competence.

The creation of VR learning materials is often seen as a complex task, with many teachers perceiving it as challenging due to the need to learn programming languages and the time investment required (Alizadeh, 2019; Lee et al., 2019; Santosa et al., 2020). However, the development of VR authoring applications in recent decades has provided a solution, enabling teachers to design VR learning materials without requiring programming skills (Billinghurst et al., 1997; Dörner et al., 2015; Steed, 2008). VR authoring refers to the process of designing VR learning materials using specialized applications (Horst et al., 2022). These VR

authoring tools serve as valuable resources, empowering educators to create VR learning materials more easily.

Based on the aforementioned research, the utilization of microlearning-based virtual reality (VR) as learning materials has been recognized as a means to motivate English language learners (ELLs), promoting sustained engagement and increased exposure to the learning materials (Piovesan, Passerino, & Pereira, 2012; Horst & Dörner, 2019; Sepang et al., 2020). While studies have addressed the need for microlearning-based English learning materials that integrate critical thinking, existing materials have often been developed separately. However, with the advent of advanced VR authoring tools that overcome the challenges of creating VR learning materials, the design of microlearning-based English learning materials infused with critical thinking skills becomes highly feasible, thus expanding learners' knowledge horizons.

In Indonesia, there are currently English learning materials integrated with virtual reality (VR) that incorporate critical thinking skills. However, these materials have primarily been developed for senior high school and university levels, lacking a microlearning approach (Ikhsan et al., 2020; Mahdian et al., 2021; Yuniarsih et al., 2022). As a result, there is a gap in providing such materials for junior high school learners. Therefore, the objective of this study is to address this gap by designing microlearning-based and critical thinking-infused VR as English learning materials for seventh-grade students.

Based on the context given above, this study is intended to fulfill the needs of the learners who face the post pandemic era to improve their motivation and stimulate their interest in learning English. English learning materials are

restructured by dividing it into smaller chunks within microlearning and infused critical thinking merged with the most recent curricula (Merdeka Belajar) and relevant level of CEFR to scaffold the learners. Then, these will be designed in VR authoring tools to create VR learning materials which focus in English language with all language skills. Microlearning-based and critical thinking-infused VR English learning materials for seventh graders as the products of this study are made to be accessible and used anytime and anywhere. With the use of the products, the learners can interact, imagine, and immerse. Overall, this study can be used as an updated English learning materials to fulfill the needs of the teacher and the learners.

This study consists of five chapters. The chapter one (introduction) is divided into background of the study, research question, purposes of the study, scope of the research, significance of the research, state of the art and definition of key terms. In this chapter, the writer exemplifies briefly the whole content of the research. Then, the chapter two consists of literature review for this study. The chapter two discusses all the terms in relation with this study including the conceptual framework. While chapter three explains the methodology used in this study including the research design and method, setting, data, data source, instruments, data collection and analysis procedures. Next, the chapter four elaborates the findings and discussions of the study. Lastly, the chapter five provides the conclusion and suggestions of the study.

1.2 Research Questions

Based on the background described above, this study raises a main research question formulated in four (4) sub-questions as follows:

Main Question:

How is the design of microlearning-based and critical thinking-infused virtual reality English learning materials for seventh graders?

Sub-questions:

- 1) To what extent are microlearning and critical thinking infused in virtual reality English learning materials for seventh graders?
- 2) How are the procedures to design microlearning-based and critical thinking-infused virtual reality English learning materials for seventh graders?
- 3) How is the development of microlearning-based and critical thinking-infused virtual reality English learning materials for seventh graders?
- 4) How are the validity and employability of the microlearning-based and critical thinking-infused virtual reality English learning materials for seventh graders?

1.3 Purposes of Study

The main purpose of this study is to design microlearning and critical thinking-infused Virtual Reality English learning materials for seventh graders. It also presents the sub-purposes of the study, as follows:

- 1) To analyze microlearning and critical thinking that are infused in the existing virtual reality English learning materials for seventh graders
- 2) To describe the procedures of designing microlearning-based and critical thinking-infused virtual reality English learning materials for seventh graders

- 3) To develop microlearning-based and critical thinking-infused virtual reality English learning materials for seventh graders
- 4) To measure the validity and employability of microlearning-based and critical thinking-infused virtual reality English learning materials for seventh graders.

1.4 Scope of Study

This study aimed to design microlearning-based and critical thinking-infused virtual reality English learning materials for seventh graders. The target competence is the seventh graders or class 7 of junior high school. The subject matter here is intended for English subject with integrated skills and concentration in curriculum of *Merdeka Belajar* within relevant CEFR level. The cross-curricular competence highlighted is the critical thinking-infused in microlearning-based English learning materials. Thus, the product of the study is English learning materials in form of VR which is designed into broken down into smaller chunks infusing critical thinking skills. It can be used for online and on-site learning to fulfill learner's needs.

The method employed in this study is Design and Development Research (DDR) from Richey and Klein (2007) and Putra et.al., (2022) which used ADDE phases (Analysis, Design, Development, and Evaluation). The procedures for designing the output of this study have been through four phases: 1) summarizing the facts and information gathered from the need analysis; 2) examining relevant theories and descriptors to design the prototyping products; 3) developing scripts and digitalizing them into a VR authoring application; and 4) evaluating the prototyping products through expert validations and an alpha test.

1.5 Significance of Study

Theoretical contributions of this study encompass a deeper understanding of microlearning, critical thinking skills, and virtual reality in the context of English language learning. It aims to provide valuable insights into the design of microlearning-based and critical thinking-infused virtual reality English learning materials for seventh graders, addressing the specific needs of learners in the post-pandemic era.

The practical significance of this study extends to various stakeholders, including learners, teachers, future researchers, and educational institutions. For learners, the implementation of these microlearning-based and critical thinking-infused VR English learning materials offers a solution to combat learning fatigue caused by the pandemic. By engaging in short yet meaningful learning activities, learners can enhance their interest, motivation, and participation while developing their English language and critical thinking skills within relevant contexts.

For teachers, the study provides an updated and innovative approach to English language instruction by incorporating microlearning and future-oriented technology, specifically virtual reality, while infusing critical thinking skills. This serves as a valuable resource for educators seeking to enhance their teaching methodologies and promote more effective learning outcomes.

Future researchers are encouraged to further explore the design and development of microlearning-based VR learning materials not only focused on critical thinking, but also incorporating other cross-curricular competencies such as problem-solving, collaboration, and digital literacy. This opens avenues for in-

depth research and the continuous improvement of English language learning materials.

Lastly, educational institutions can benefit from this study as a reference for enhancing education quality and improvement efforts. By leveraging the findings and recommendations of this study, institutions can align their educational practices with the principles of microlearning, critical thinking, and virtual reality, thereby fostering a more engaging and effective learning environment.

1.6 State of the Arts

Yuniarsih et al. (2022) conducted research highlighting the urgency of microlearning, affirming its effectiveness in motivating learners to engage in independent learning and fostering creative and critical thinking skills. Building upon their findings, Fedorova et al. (2022) and Horst & Dörner (2019) emphasized the potential of incorporating microlearning and critical thinking in virtual reality (VR) learning materials as effective supplements to traditional learning methods. Chen et al. (2021) demonstrated the benefits of using VR in college classrooms, improving problem-solving abilities, critical thinking responses, long-term memory retention, and learner motivation.

However, existing VR learning materials primarily focused on higher education in fields such as science subjects, lacking emphasis on language learning and microlearning formats. This presents an opportunity to explore the development of microlearning-based VR materials specifically tailored for language learning, particularly English. With only a limited number of publications (13 out of 157) investigating the use of VR in language education

(Luo et al., 2021), it is evident that designing microlearning-based and critical thinking-infused VR learning materials in the language discipline remains largely unexplored. Consequently, this study aims to bridge this gap by designing microlearning-based and critical thinking-infused VR English learning materials for seventh-grade learners, contributing novel insights to the field.

1.7 Definition of Key Terms

To avoid misinterpretation, the technical terms found throughout this study are operationally defined as follows:

1. **Microlearning** is an approach for designing learning material into small and focused segments presented in various of microlearning object materials.
2. **VR** stands for Virtual Reality which refers to the technology that creates 3D graphic environment combined with different interface devices. It is to immerse the learner while presented the microlearning-based English learning materials.
3. **VR Learning Materials** refer to materials which are designed in form of VR. These learning materials are integrated based on microlearning and critical thinking-infused for 7th Grade English.
4. **Critical Thinking Skills** are defined as a disciplinary process that is intellectually active and skilled at higher order thinking skills such as conceptualizing, applying, analyzing, synthesizing, and evaluating.
5. **Seventh Graders** denotes the freshman of junior high school level in the foreign language class. Here, this study focuses on learners who are in range of 13-14 years of age.