CHAPTER 1

Overview

Virtual reality (VR) technology has been increasingly used in education and training in recent years, offering unique opportunities for immersive and interactive learning experiences. By integrating VR with an LMS, learners can access course materials and participate in activities in a three-dimensional environment, enhancing their understanding and retention of concepts.

Based on Harvard Business Review (HBR) by Jeanne C. Meister, in her article titled, “How companies are using VR to Develop Employees’ Soft skill,” the shortage of soft skills is a growing problem for businesses. Recent surveys found that 89% of executives and 59% of hiring managers struggle to find candidates with important soft skills like leadership, teamwork, and communication. This issue is becoming even more critical as more people work remotely due to the pandemic, making it harder to develop and find these skills. (Meister, 2021)

As in US, according to Thomas Alsop, 58% of teacher use VR to teach children, in medical training program the use of VR is 56% to train surgeon, and 54% to engage patient in VR gaming to distract them. Where as what Meister state in the article of HBR, there haven’t been any

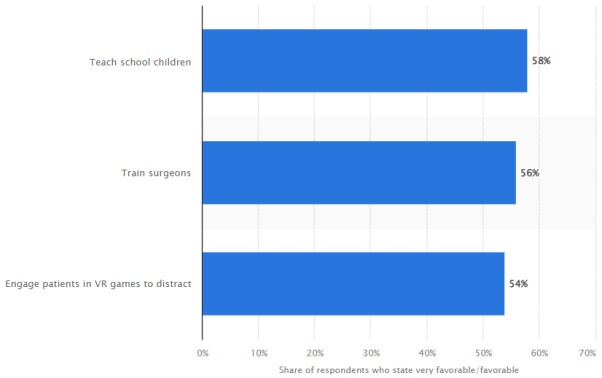

Figure 1. VR Application in training and Medical Support. (Alsop, 2022)

Evaluating the integration of a Learning Management System (LMS) with a Virtual Reality (VR) platform in educational and training settings to boost user engagement, motivation, and retention is a pioneering effort in the nation's diverse education and training landscape. This research project aims to determine the efficacy of this integration, accounting for Indonesia's unique cultural and contextual factors.

The integration of an LMS with VR holds potential for providing users in Indonesia with immersive and interactive learning experiences that make complex concepts more accessible and memorable. Yet, challenges such as the cost and accessibility of VR technology and its alignment with Indonesian educational practices must be addressed.

To assess this integration, the research will employ a comprehensive framework, including the Technology Acceptance Model (TAM), Experiential Learning Theory (ELT), Self-Determination Theory (SDT), and Social Learning Theory (SLT). These theories serve as a foundation for understanding how Indonesian users perceive and utilize VR in education.
The research aims to investigate how integrating an LMS with a VR platform influences user engagement, motivation, and retention, considering the impact of VR design and instructional strategies tailored to Indonesian users. Additionally, it will explore how users' prior experiences with VR and their learning preferences play a role in the process.

1.1. Research Background

Virtual reality (VR) technology has been increasingly used in education and training programs in recent years, offering unique opportunities for immersive and interactive learning experiences. By integrating VR with an LMS, learners can access course materials and participate in activities in a three-dimensional environment, enhancing their understanding and retention of concepts.

There are several benefits to integrating an LMS with a VR platform for education. For example, learners can explore and interact with complex and abstract concepts in a more tangible and engaging way, making learning more memorable and effective. Additionally, VR can simulate real-world scenarios that may be too dangerous, costly, or impractical to replicate in real life, allowing learners to practice skills and problem-solving in a safe and controlled environment.

However, there are also challenges associated with integrating VR with an LMS. One of the biggest challenges is the cost and technical requirements of VR technology, which may be prohibitively expensive for some institutions. Additionally, VR experiences may be disorienting or overwhelming for some learners, leading to reduced engagement and retention. There may also be concerns around accessibility and equity, as not all learners may have equal access to the necessary technology.

To evaluate the integration of an LMS with a VR platform, researchers may conduct a study to assess the impact on user engagement, motivation, and retention. This study could involve a comparison of user outcomes in courses that utilize VR technology compared to those that do not. Researchers may also examine user feedback and perceptions of the VR learning experience, as well as the effectiveness of different instructional design strategies for VR-based learning.

The evaluation of the integration of an LMS with a VR platform could provide valuable insights into the benefits and challenges of this technology for education and recommend best practices for implementation.

1.2. Research Problem

The research problem in evaluating the integration of an LMS with a virtual reality platform is to investigate the effectiveness of this technology for improving user engagement, motivation, and retention in educational settings. While there are numerous benefits to using VR for immersive and interactive learning experiences, there is still a lack of research on how this technology can be integrated effectively with an LMS to enhance the learning experience.

One of the primary research questions that could be explored is **how the integration of an LMS with a VR platform impacts user engagement**. VR has the potential to create a more immersive and interactive learning environment, but it is not clear whether this translates to increased user engagement in the learning process. Additionally, there may be specific features or design elements of the VR platform that are more effective at engaging users, which would be important to identify in order to optimize the learning experience.

Another research question could focus on **the impact of the integration of an LMS with a VR platform on user motivation**. While immersive learning experiences can be engaging, it is not clear whether they lead to increased motivation to learn or improve academic performance. Researchers could investigate whether the use of VR in education leads to increased intrinsic motivation, self-efficacy, or academic achievement.

A third research question could **examine how the integration of an LMS with a VR platform impacts user retention**. VR has the potential to create more memorable and meaningful learning experiences, which could improve user retention of course material. However, it is not clear whether this is the case or how long the effects of VR-based learning last. This research

question could explore whether VR-based learning leads to increased long-term retention of course material.

The research problem in evaluating the integration of an LMS with a VR platform is **to assess the effectiveness of this technology for improving user engagement, motivation, and retention, and to identify best practices for implementation**. This research could inform the design and implementation of VR-based learning experiences, as well as contribute to our understanding of the potential benefits and limitations of this technology in education.

1.3. Research Objectives

The research objective of evaluating the integration of an LMS with a virtual reality platform is to assess the effectiveness of this technology for improving user engagement, motivation, and retention in educational settings. Specifically, the research aims to:

1. **Investigate the impact of integrating an LMS with a VR platform on user engagement in the learning process**. This includes exploring the features and design elements of VR-based learning experiences that are most effective at engaging users.
2. **Examine the impact of integrating an LMS with a VR platform on user motivation to learn**. This includes investigating whether VR-based learning experiences lead to increased intrinsic motivation, self-efficacy, or academic achievement.
3. This includes investigating whether VR-based learning experiences lead to increased **Assess the impact of integrating an LMS with a VR platform on user retention of course material** long-term retention of course material.
4. **Identify best practices for the design and implementation of VR-based learning experiences that integrate with an LMS**. This includes exploring the optimal instructional design strategies, technical requirements, and cost-effectiveness of VR technology in education.

The research objective is to **provide insights into the benefits and challenges of integrating an LMS with a virtual reality platform for immersive learning experiences**, and to recommend best practices for implementation. By addressing these research questions, the study could contribute to our understanding of the potential of VR technology in education and inform the development of effective VR-based learning experiences.

1.4. Research Questions

In the rapidly evolving landscape of educational technology, Virtual Reality (VR) has emerged as a transformative tool, offering unprecedented opportunities for immersive learning experiences. This study explores the intricate relationships between motivation, engagement, retention, and actual usage of VR technologies, and their collective impact on the development of essential soft skills in a virtual learning environment.

1.4.1. What impact does motivation have on engagement in VR-based learning environments?
1.4.2. How does engagement with VR learning materials influence learners' retention over time?
1.4.3. Does higher motivation among learners lead to increased actual usage of VR technology?
1.4.4. In what ways does engagement with the content affect the actual usage of VR technologies?
1.4.5. Does retention of material correlate with increased actual usage of the VR platform?
1.4.6. How does motivation in VR-based training contribute to the overall impact on learners' soft skills development?
1.4.7. What is the relationship between the actual usage of VR systems and the impact on developing soft skills?
1.4.8. How does retaining information from VR training sessions affect the overall development of soft skills?
1.4.9. Is there a mediating effect of actual usage on the relationship between motivation and the impact on soft skills?
1.4.10. Does actual usage mediate the relationship between engagement and the impact on soft skills?
1.4.11. Can the retention of information mediate the impact of VR training on soft skills development?

1.5. Research Benefit

The research on evaluating the integration of an LMS with a virtual reality platform has several potential benefits:

1.5.1 Academic contribution

Conducting an evaluation of the integration of a Learning Management System (LMS) with a Virtual Reality (VR) platform can yield several theoretical benefits in the field of education and technology, such as:

1.5.1.1 **Advancement of Educational Technology:** Research in this area can contribute to the advancement of educational technology by exploring the effectiveness of integrating VR into the LMS. This knowledge can help in improving the design and implementation of future educational tools and platforms.

1.5.1.2 **Enhanced Learning Outcomes:** Theoretical research can assess the impact of VR on learning outcomes. It can help in understanding how VR can improve student engagement, retention, and comprehension of complex topics, leading to more effective learning strategies.

1.5.1.3 **Pedagogical Insights:** The evaluation can provide insights into the pedagogical aspects of using VR in education. We can explore how different instructional methods within VR environments influence learning and provide theoretical frameworks for educators.

1.5.1.4 **Improving instructional design:** By investigating the design elements and instructional strategies that are most effective in VR-based learning experiences, the study can inform the development of more effective instructional design approaches for online and blended learning environments.

1.5.1.5 **User Experience and Engagement:** Understanding the theoretical aspects of how VR affects the user experience and engagement is valuable. This research can shed light on the psychological and cognitive aspects of learning in virtual environments.

1.5.1.6 **Accessibility and Inclusivity:** Theoretical research can explore how the integration of VR with LMS affects accessibility and inclusivity in education. It can lead to theoretical models for ensuring equitable access to VR-based learning.

1.5.1.7 **Best Practices:** Research can identify theoretical best practices for the integration of VR with LMS systems. These best practices can serve as guidelines for educators and institutions looking to adopt VR technology in their teaching methods.

1.5.1.8 **Future Trends:** Theoretical research can anticipate and speculate on future trends in educational technology. It can provide insights into how VR may evolve and impact the education sector in the coming years.

1.5.1.9 **Knowledge Sharing:** Theoretical research can contribute to the body of knowledge in the fields of educational technology, instructional design, and cognitive psychology. This knowledge can be shared with educators, researchers, and policymakers.

1.5.2 Practical Contribution

Researching the evaluation of integrating a Learning Management System (LMS) with a Virtual Reality (VR) platform offers several practical benefits in the real world:

1.5.2.1 **Enhanced Educational Outcomes:** Practical research can assess the impact of LMS-VR integration on student learning outcomes. It can provide evidence of whether this technology improves academic performance, knowledge retention, and skill acquisition.

1.5.2.2 **Efficient Training and Development:** In the corporate world, research can demonstrate the effectiveness of using LMS-VR for employee training and skill development. This can lead to more efficient onboarding and upskilling processes.

1.5.2.3 **Customized Learning Experiences:** By identifying effective strategies for personalizing VR-based education and training, research can help tailor content to individual learning needs and preferences, enhancing the overall learning experience.

1.5.2.4 **Healthcare and Medical Advancements**: Research can validate the use of VR in medical training, surgical simulations, and patient care. It can lead to advancements in healthcare education and improved patient outcomes.

1.5.2.5 **Safety Training and Risk Reduction:** Practical research can demonstrate the effectiveness of VR in safety training across various industries. It can help reduce workplace accidents, lower risks, and enhance overall safety protocols.

1.5.2.6 **Professional Development:** In the context of professional development, research can show how VR enhances practical skill development and career advancement, making it a valuable tool for lifelong learning.

1.5.2.7 **Informing decision-making and resource allocation**: As institutions consider investing in VR technology, this research can provide insights into the costs and benefits of integrating VR technology with an LMS, and identify the most cost-effective and scalable strategies for implementation.

1.5.2.8 **Workforce Adaptability**: Practical research can show how LMS-VR integration can help organizations adapt to evolving industry trends and technological advancements. It prepares the workforce for the future.

The research on evaluating the integration of an LMS with a virtual reality platform has the potential to improve the quality of education and enhance the learning experience for users, while also advancing our understanding of the potential of VR technology in education.