

CHAPTER V

CONCLUSION AND SUGGESTIONS

5.1. Summary of Findings

This study explored the integration of Learning Management Systems (LMS) with Virtual Reality (VR) platforms, focusing on their potential to enhance user engagement, motivation, and retention in educational settings. The research utilized a comprehensive theoretical framework, incorporating the Technology Acceptance Model (TAM), Experiential Learning Theory (ELT), Self-Determination Theory (SDT), and Social Learning Theory (SLT). Key findings from the research are summarized below:

1. Impact on User Engagement: VR-enhanced LMS platforms were found to foster higher engagement by offering immersive and interactive learning environments. This engagement was further influenced by design elements such as intuitive navigation, scenario-based simulations, and real-world applications.

The study highlighted that overly complex or poorly designed VR experiences might reduce engagement by overwhelming learners or causing cognitive overload.

2. Impact on Motivation: The integration of VR into LMS platforms showed potential to increase both intrinsic and extrinsic motivation, particularly by providing learners with a sense of autonomy, competence, and relatedness.

Motivation was particularly driven by features allowing students to control their learning pace and interact with realistic, scenario-driven content.

3. Impact on Retention: The research indicated that VR-based learning experiences can improve retention of course material due to their ability to create meaningful, memorable, and immersive experiences.

Retention benefits were especially noticeable in subjects that require practical application or complex problem-solving.

5.2. Key Challenge: High costs and limited accessibility to VR technology remain significant barriers, especially in developing regions like Indonesia.

1. Equity issues, such as unequal access to hardware and internet connectivity, pose challenges to widespread adoption.

2. The usability of VR platforms is influenced by the user's familiarity with technology, and insufficient training can hinder adoption.

5.3. Contributions of the Study

This research contributes to the academic and practical understanding of VR-enhanced LMS platforms in the following ways:

- **Theoretical Contributions:** By integrating multiple theoretical frameworks (TAM, ELT, SDT, and SLT), this study provides a multidimensional perspective on the factors influencing the success of VR in education. It advances knowledge on how VR impacts engagement, motivation, and retention, while providing a structured methodology to assess these outcomes.
- **Practical Contributions:**
The findings offer actionable insights for educators and institutions seeking to implement VR-enhanced LMS platforms.
- Recommendations for optimizing design elements and instructional strategies can guide the development of more effective VR-based educational tools.

5.4. Localized Perspective:

By addressing the cultural and contextual factors of Indonesia, this study highlights the importance of tailoring VR solutions to the unique needs of local learners and institutions.

5.5. Limitations of the Study

Despite its contributions, this study faced several limitations:

- **Resource Constraints:** The study acknowledges the high costs and limited availability of VR technology, which may have restricted access to broader sample sizes for empirical testing.
- **Generalizability:**
Findings may not be universally applicable due to the focus on Indonesia's educational context. Cross-cultural comparisons are needed to validate the study's conclusions in other regions.
- **Focus on Propositions:**

While the study develops hypotheses and propositions, empirical validation was limited. Further experimental studies are needed to verify the relationships proposed between engagement, motivation, retention, and VR usage.

- **Technological Barriers:**

Some learners and educators may face difficulties adapting to VR technology, especially those unfamiliar with advanced digital tools.

5.6. Recommendations for Future Research

Building on the findings and limitations, the following recommendations are proposed for future research:

- a. Empirical Testing:**

Conduct large-scale, longitudinal studies to validate the hypotheses presented in this research, particularly focusing on long-term retention and skill acquisition.

- b. Cost-Effective VR Solutions:**

Explore the use of low-cost VR solutions, such as mobile VR or web-based simulations, to improve accessibility and reduce implementation costs.

- c. Personalization and Inclusivity:**

Investigate how VR-based LMS platforms can be customized to meet the needs of diverse learners, including those with disabilities or limited access to technology.

- d. Cross-Cultural Studies:**

Extend the research to other countries and cultural settings to compare the effectiveness of VR-enhanced LMS platforms across different educational contexts.

- e. Scalability and Sustainability:**

Examine the scalability of VR in large classrooms and its environmental and financial sustainability in the long term.

- f. Integration with Emerging Technologies:**

Explore how VR can be integrated with other technologies, such as Artificial Intelligence (AI) or Augmented Reality (AR), to create even more impactful learning experiences.

5.5 Final Remarks

This study underscores the transformative potential of integrating Virtual Reality with Learning Management Systems in education. By addressing the key areas of user engagement, motivation, and retention, VR-enhanced LMS platforms hold promise for creating immersive, interactive, and effective learning environments. However, significant challenges related to cost, accessibility, and usability must be addressed to ensure equitable adoption and meaningful impact.

As educational institutions and policymakers consider the adoption of VR technologies, this research provides valuable insights and recommendations to guide the design and implementation of effective VR-based learning experiences. With continued advancements in technology and further empirical validation, VR has the potential to revolutionize education, equipping learners with the skills and knowledge needed for the challenges of the 21st century.

