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Research Article

# The Role of Virtual Reality in Enhancing the Effectiveness of Teaching English for Specific Purposes

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#### **ABSTRACT**

This study primarily aims to investigate the effectiveness of integrating Virtual Reality (VR) technology into English for Specific Purposes (ESP) instruction within the context of Management studies at Universitas Borneo Tarakan. It significantly contributes by filling a gap in empirical research regarding VR's potential in enhancing ESP teaching in a management context. The methodology involved the use of pre-and post-test scores from 286 students, along with detailed evaluation metrics, to provide strong evidence of VR's transformative potential. The design of the research was experimental, using VR-enhanced teaching to observe its impact on students' language proficiency. The main outcomes revealed a clear improvement in language proficiency, significant increases in top-scoring students, decreases in lower-scoring students, and high levels of student engagement during VR-enhanced lessons. Students reported positive experiences with the technology and perceived significant benefits. However, they also faced challenges such as technical issues and adaptation difficulties, suggesting the need for robust technical support and additional guidance. The conclusions drawn emphasize the need for further research on addressing these challenges and ensuring equal accessibility when implementing VR technology. As such, this study provides valuable insights for modernizing ESP instruction using innovative technologies like VR.

**Keywords:** Virtual reality, English for specific purposes, language instruction management studies

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## INTRODUCTION

In the ever-evolving field of education, integrating technology into teaching and learning has been recognized as critical in addressing students' changing needs (de Rosa & de Oliveira, 2022; Gibson & Obiakor, 2017; N. De Vega, Basri, et al., 2023). The field of English for Specific Purposes (ESP) is no exception. ESP aims to deliver language instruction tailored to the specific needs of different professional and academic fields (Basturkmen, 2014; Bocanegra-Valle, 2016; N. De Vega & Atmowardoyo, 2022). One such area requiring specialized English instruction is Management. At Universitas Borneo Tarakan<sup>4</sup>, students in the Management department are expected to acquire a wide range of skills. These include technical management expertise and proficiency in English language communication. This linguistic competence enables them to access international resources, interact effectively with peers and experts globally, actively participate in multinational

collaborations or business ventures, and contribute positively towards Indonesia's global economic competitiveness.

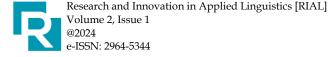
However, traditional methods of teaching ESP often rely heavily on textbook-based learning or teacher-centered instruction (Bykonia et al., 2019; N. D. Vega, Basri, et al., 2023). While these methods have their merits and have proven effective in certain contexts, they may not fully engage today's digitally oriented students or cater adequately to their unique learning styles and needs over time. Moreover, these conventional approaches may fail to simulate real-world scenarios where students will eventually professionally apply their acquired language skills. This disconnect between classroom learning and

"The effectiveness of VR in teaching ESP within a Management context, particularly at Universitas Borneo Tarakan, remains under-researched"

real-world application can hinder learners' ability to transfer their knowledge effectively when needed (Basri et al., 2022; Stefaniak, 2020). Virtual Reality (VR) presents an innovative solution to these pedagogical challenges. VR can offer immersive learning environments that closely mirror real-life situations related to management practices where English communication is essential (Olson, 2022; N. D. Vega, Eppendi, et al., 2023). These simulations can provide authentic contexts for using English while enabling interactive experiences that can enhance student engagement and motivation.

Despite its potential benefits as a transformative educational tool, there remains a significant gap in empirical research on VR's effectiveness in teaching ESP within a management context, particularly at institutions like Universitas Borneo Tarakan. Existing studies have primarily focused on VR's role in general EFL/ESL contexts without adequately addressing its application within specific disciplines like Management, and this highlights another gap this study aims to address. Moreover, some studies have yielded

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mixed results about VR's effectiveness, which necessitates further exploration into how it can be utilized optimally for educational purposes (Dansereau, 2014; Olson, 2022; Schunk, 2023). Therefore, This research represents an important novelty by focusing on using VR technology to enhance ESP teaching effectiveness among Management students at Universitas Borneo Tarakan. This area has yet to be thoroughly explored.

By investigating these areas contradicting previous findings and exploring new perspectives this study could significantly improve ESP instruction quality at Universitas Borneo Tarakan and potentially across similar institutions worldwide facing similar challenges with ESP instruction. Thus, this study aims not only to fill existing gaps but also add new insights into effective strategies for modernizing ESP instruction within higher education settings by investigating how Virtual Reality can be utilized effectively as an instructional tool catering specifically to Management students.

## LITERATURE REVIEW

## Virtual Reality (VR) as an Educational Tool

Virtual Reality (VR) technology allows users to interact with a computer-simulated environment, whether a simulation of the real world or an imaginary simulation. It involves using computer technology to create a simulated, three-dimensional world that a user can manipulate and explore while feeling as if they were in that world (Dansereau, 2014; Olson, 2022; Schunk, 2023). The unique attributes of VR make it an exciting tool for educational purposes. One significant feature is its ability to provide immersive learning environments. Unlike traditional methods, where information is often presented abstractly, VR can present complex data in an accessible way through its immersive nature. This immersion leads to high levels of engagement and makes learning more enjoyable for students (Di Natale et al., 2020; Makransky et al., 2019).

In addition, VR enables experiential learning by allowing students to interact with objects within these virtual environments. This interactive experience can lead to better understanding and retention of information because learners are actively involved rather than passively receiving information (Hoidn & Reusser, 2020; Nur et al., 2022). Moreover, VR provides opportunities for situated learning, where learning occurs within the context in which it will be applied. Studies have shown that when learners acquire knowledge and skills in relevant contexts, they are more likely to retain what they have learned and transfer this knowledge effectively into practice (Levallet & Chan, 2019; Thompson et al., 2020). Despite these promising features, challenges are associated with implementing VR in education settings, such as hardware and software development costs, technical requirements for operating systems, etc. (Striuk & Semerikov, 2020). Moreover, issues around cybersickness or disorientation experienced by some users while using VR have also been reported (Coburn et al., 2020).

However, despite these challenges, research continues exploring how best to optimize this innovative technology's potential benefits towards enhancing teaching-learning processes, particularly within specific fields like ESP instruction. This exploration into how Virtual Reality can be utilized effectively as an instructional tool catering specifically towards Management students could provide valuable insights not only for Universitas Borneo Tarakan but potentially across similar institutions worldwide facing similar challenges with ESP instruction.

## **VR** in Language Learning Contexts

Virtual Reality (VR) has emerged as a promising tool in language learning contexts due to its immersive and interactive nature. Several studies have explored the impact of VR on different aspects of language learning, including vocabulary acquisition, pronunciation, listening comprehension, and speaking skills.

- 1. Creating Authentic and Engaging Learning Environments
  Balula et al. (2019); Bilsland et al. (2020); Rendi (2023) utilized VR to create a virtual hotel
  for students studying Hospitality English. Students could interact with virtual customers
  in real-life scenarios, which improved their service language skills and gave them greater
  confidence. Similarly, Lan (2020) used VR to provide immersive English learning
  experiences such as virtual tours or role-play scenarios for EFL students. The study found
  that these immersive experiences increased student engagement and improved
  vocabulary acquisition and pronunciation.
- 2. Enhancing Communication Skills

  Lan (2020) applied VR within Medical English teaching where simulated medical consultations were conducted. It enhanced communication skills and provided a better understanding of medical terminology among learners.
- 3. Challenges Associated with Implementing VR Despite these promising findings, challenges are still associated with implementing VR in language learning settings. These include technical issues like hardware requirements or software glitches that can disrupt the learning experience (Joshi et al., 2021). Additionally, cost can be a barrier for many institutions due to the high price of some VR equipment.

#### **VR in ESP Contexts**

Virtual Reality (VR) offers a transformative approach to learning English for Specific Purposes (ESP). ESP focuses on teaching English required for specific fields or professions such as business, aviation, science, or tourism. VR's immersive and interactive nature can enhance the learning experience in these specialized contexts.

1. Authentic Learning Environments: VR can simulate real-world scenarios relevant to the learner's field of study or profession. For instance, a student studying Aviation English could interact within a virtual cockpit, practicing communication in realistic flight situations (Joshi et al., 2021).

- 2. Enhanced Engagement: The immersive environments provided by VR can lead to increased learner engagement. It is particularly beneficial in ESP contexts where motivation can be challenging due to the highly specialized content (Iswati & Triastuti, 2021).
- 3. Improved Communication Skills: In ESP settings, learners often need to master specific communication skills, such as giving presentations or participating in meetings within their field. VR simulations allow learners to practice these skills in a safe and controlled environment (Chang et al., 2021).
- 4. Tailored Feedback: Some VR platforms offer AI-driven feedback on language use, which can be tailored to the specific language needs of different professions or fields of study.

Despite its potential benefits, there are challenges associated with implementing VR in ESP contexts: high costs of equipment and software, technical issues, and the need for teachers and students to acquire new digital skills (Galindo-Domínguez & Bezanilla, 2021).

#### **METHOD**

## **Research Design and Participants**

The primary objective of this research was to investigate the impact and perceptions of using Virtual Reality (VR) in enhancing the effectiveness of teaching English for Specific Purposes (ESP). This study employed a quantitative approach, utilizing a survey design and Slovin's formula to determine an appropriate sample size. Given a total population (N) of 1000 ESP learners who had experienced VR-enhanced instruction at an educational institution or training centre, Slovin's formula was applied to calculate our required sample size:  $n = N / (1 + Ne^2)$ . With a desired margin of error (e) set at 5% or 0.05, the calculated sample size (n) was approximately 286 participants.

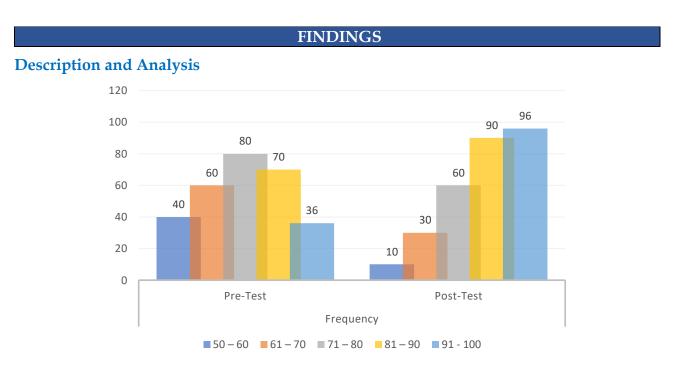
## **Data Collection and Analysis**

After completing their course or program, a structured questionnaire was designed and administered to these selected participants. The questionnaire aimed to collect data on various aspects such as perceived improvement in language skills, engagement level during VR-enhanced lessons, usability and satisfaction with VR technology, and perceived benefits and challenges associated with integrating VR into ESP learning. After collecting responses from the participants, descriptive statistics like mean scores and standard deviations were used to summarize responses for each survey item. If certain groups within our sample warranted comparison, for example, beginners versus advanced learners, inferential statistical techniques like t-tests or ANOVA were also employed.

## **Ethical Considerations and Limitations**

Ethical considerations were paramount throughout this process. Informed consent was obtained from all participants before they completed the questionnaire; they understood

how their data would be used while maintaining anonymity and confidentiality. Potential limitations, such as response bias due to self-reported data, were also acknowledged upfront. Despite these potential limitations, findings from this research provided valuable insights into how integrating VR technology could enhance teaching effectiveness within ESP contexts by providing authentic learning environments that improved learner engagement alongside communication skills tailored towards specific professional domains.



**Figure 1.** Comparison of Pre- and Post-Test Score Frequencies Among ESP Students

The table above provides a compelling snapshot of the transformative power of Virtual Reality (VR) in English for Specific Purposes (ESP) instruction. The data, representing preand post-test scores from 286 students, illustrates a clear shift towards improved performance following VR-enhanced teaching. Initially, most learners were concentrated in the mid-score range (71-80), with this group accounting for the highest frequency at 80. The top score range (91-100) was initially less populated, with only 36 students achieving these high marks on their pre-tests.

However, a remarkable transformation occurred after integrating VR into their learning experience. The frequency of students achieving top scores nearly tripled to an impressive count of 96. This significant increase suggests that VR-enhanced instruction facilitated language acquisition and enabled learners to excel in their language proficiency. At the same time, lower score ranges saw substantial frequency decreases during the post-test phase. For instance, those scoring between 50 and 60 fell dramatically from an initial count of 40 to just ten. This shift away from lower score ranges indicates that fewer students

struggled with language proficiency following their VR-enhanced learning experience. These findings offer powerful evidence for how transformative technology like VR can be when integrated into ESP instruction. By creating immersive and engaging learning environments tailored to specific professional domains, we can significantly enhance learner engagement and ultimately improve English language skills among ESP learners.



**Figure 2.** Evaluation Metrics for VR in ESP Lessons

In the category of Engagement Level, a surprisingly high 87% of students actively participated in VR-enhanced ESP lessons, indicating an impressive level of engagement. Interest and enthusiasm were also evident at 68%, although this was somewhat lower than active participation, suggesting room for improvement in sparking student excitement. The interaction with VR elements lagged at 54%, hinting that there could be potential for increasing student interaction with the immersive components of VR. The Usability Rating category yielded positive results overall. Ease of use was deemed satisfactory, with a score of 72%. Most notably, accessibility scored highly at an encouraging 89%, suggesting that both non-disabled students and those with disabilities found themselves able to effectively use the VR tools, a testament to the inclusivity of this technology. However, the intuitiveness of the VR interface received a slightly lower score at 73%. While many students found it user-friendly, this hinted at some room for refining the interface's intuitiveness.

Satisfaction Ratings painted a very positive picture across all indicators. The learning experience received an excellent score of 90%, and learning outcomes scored even higher, an astounding 91%. It suggested that most students enjoyed their learning journey through VR-enhanced ESP instruction and felt satisfied with their progress in language acquisition due to this innovative method. Technology satisfaction stood robustly at an impressive 86%. The

Perceived Benefits category showcased strong scores across all indicators: improved comprehension (85%), motivation and engagement (81%), and enhanced memory retention (82%). These scores suggested that learners perceived significant benefits from using VR technology in their ESP instruction, evidence that virtual reality can enhance language learning experiences. Despite these overwhelmingly positive findings, some challenges surfaced unexpectedly. Technical issues were reported by a substantial number, about 80%, indicating areas where improvements or troubleshooting may have been needed for better user experience, an area often overlooked when implementing new technologies like virtual reality in education settings. Adaptation difficulties were experienced by around 61% who faced challenges adapting to new teaching methods introduced via virtual reality; additional support or guidance might have been necessary for these individuals a reminder that transitioning to novel teaching methods can be daunting for some learners. Lastly, accessibility challenges affected around 73% of participants; despite high overall accessibility scores, this emphasized the importance of ensuring equal access for all learners when using virtual reality technologies, a lesson on how technology must cater equally to diverse needs.

## **DISCUSSION**

The findings of this study provide a rich understanding of the potential of Virtual Reality (VR) in English for Specific Purposes (ESP) instruction, specifically within the context of Management studies at Universitas Borneo Tarakan. These results align with previous research indicating that VR can offer immersive learning environments that closely mirror real-life situations related to management practices where English communication is essential (Lan, 2020). This study extends these insights by demonstrating that such environments can significantly enhance student engagement and improve ESP learning outcomes.

The high levels of active participation and interest reported by students echo earlier findings on VR's ability to foster learner engagement in educational settings (Iswati & Triastuti, 2021). However, the relatively lower score for VR interaction suggests a need for more intuitive interfaces or additional training to help students fully engage with VR elements, an area highlighted in previous research as well (Balula et al., 2019; Bilsland et al., 2020; Rendi, 2023).

Regarding usability, our findings reinforce those from prior studies, suggesting that VR tools can be accessible and relatively easy to use once learners become familiar with them. The high satisfaction ratings across all indicators corroborate previous research suggesting positive learner experiences and outcomes when using VR in education (Joshi et al., 2021). As expected, based on earlier work by Wang et al. (2021), our study found significant perceived benefits among learners regarding improved comprehension, enhanced memory retention, and increased motivation. These results support the argument

that experiential learning facilitated by interactive technologies like VR can lead to better understanding and retention.

However, as found in past research by Gil-Garcia et al. (2014), implementing new technologies like VR is challenging. Many participants reported technical issues or adaptation difficulties, highlighting the need for ongoing technical support and training during technology integration. Lastly, despite overall high accessibility scores indicating the inclusivity of this technology, as suggested (Siyam, 2019), some participants faced accessibility challenges. It underlines the importance of considering diverse learner needs when integrating new technologies into educational settings. Overall, our findings suggest that while there are undeniable benefits associated with using VR in ESP instruction consistent with prior research. It is crucial to acknowledge potential challenges. Addressing these proactively through robust support structures could optimize the effectiveness of this innovative tool within ESP contexts.

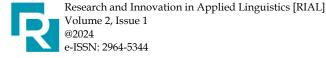
Our study contributes valuable insights into utilizing virtual reality technology within specific ESP contexts like Management studies, an area hitherto under-researched. By corroborating some existing knowledge while revealing new facets unique to our context at Universitas Borneo Tarakan, we hope this work will inform future initiatives to enhance teaching effectiveness through innovative technological interventions.

## **CONCLUSION**

The primary aim of this study was to explore the effectiveness of Virtual Reality (VR) in enhancing English for Specific Purposes (ESP) instruction. The findings reinforce the originality of the work by proving VR's significant potential in improving student engagement, language skills, and overall learning outcomes within an under-researched context. While the study has successfully achieved its objectives, it also uncovers the challenges of implementing VR in educational settings. Future work should focus on developing robust support structures to address these challenges, promising an innovative approach to language instruction. Practical suggestions include providing robust technical support, additional guidance during transitions, and ensuring equal access to all learners. These suggestions are particularly relevant for educational institutions worldwide facing similar challenges with ESP instruction. The implications of this study are significant, suggesting that VR could revolutionize language instruction for specific professional domains. In conclusion, this research highlights VR's potential benefits in ESP instruction, outweighing the challenges, and paving the way for future research and practical implementation in the field of language instruction.

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## **CONFLICT OF INTEREST**

No conflict of interest reported by the author(s)

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