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07-3818455
edgii.apbpg@gmail.com

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Preface

Pioneering Educational Perspectives: Series 2025 is a collection of thought-provoking insights and research contributions exploring contemporary educational trends and practices. This eBook presents a diverse range of perspectives on innovative teaching methodologies, digital learning strategies, and transformative approaches in education. Designed to serve as a resource for educators, researchers, and practitioners, it aims to inspire meaningful discussions and advancements in the field. Through carefully curated chapters, this publication offers fresh ideas and practical solutions to enhance learning experiences in an ever-evolving educational landscape.

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OPTIMIZING CONTENT DELIVERY FOR TEACHING AND LEARNING IN SCIENCE YEAR 5 USING A VIRTUAL REALITY ENVIRONMENT WITH COSPACES EDU

Muhammad Asyraf Abdullah Zawawi

**Corresponding author: g-19525984@moe-dl.edu.my*

ABSTRACT

The integration of Virtual Reality (VR) and other digital tools in education has garnered considerable attention, particularly in enhancing science education. This project maximizes the use of CoSpaces Edu, a VR platform, to enrich teaching for educators and the learning experience for Year 5 Science students. The central objective is to create immersive, engaging, and interactive learning environments using VR with CoSpaces Edu to optimize teaching and learning in Science Year 5. By implementing CoSpaces Edu, educators can design lessons that allow students to explore virtual environments, interact in real time with virtual elements, and visualize scientific phenomena in a safe and controlled space, thereby enhancing their learning experience. This project explores the potential of VR to transform traditional science education by promoting a deeper understanding and retention of scientific knowledge among Year 5 students.

KEYWORDS: Virtual Reality, Science Education, CoSpaces Edu, Digital Tools, teaching and learning.

PROBLEM AND OBJECTIVE

Traditional methods of teaching science often struggle to effectively convey abstract concepts to younger students (Almasri, 2024), especially in the Year 5 science curriculum, where foundational understanding is critical. This project aims to address this challenge by integrating Virtual Reality technology, specifically through the CoSpaces Edu platform, into the educational process. The goal is to optimize the teaching and learning experience in the classroom, enhance the interactivity and engagement of science lessons, and improve students' comprehension and interest in the subject. The primary objective of this project is as follows:

1. To integrate Virtual Reality Technology:
   - Incorporate VR technology, specifically using the CoSpaces Edu platform, to transform the educational process, making it more relevant and effective.
2. Optimize the Educational Experience using VR for support teaching and learning:
   - Enhance both teaching and learning by creating a more interactive, engaging, and effective educational environment using VR for Science Year 5 subject.
3. To increase student engagement in classroom.
   - Boost students' interest and engagement in science by creating more engaging and dynamic learning experiences.

DESIGN DESCRIPTION

This project design centres on using CoSpaces Edu, a VR platform that enables the creation of interactive 3D environments tailored for educational purposes covered topics from the science curriculum. (Khattib & Alt, 2024). The platform's user-friendly nature allows educators to

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develop lessons without advanced programming skills (Berns, Franco & Sánchez, 2023). The project involves creating virtual environment, 3D models, and immersive learning for content delivery aligned with the Year 5 science curriculum. The design aims to enhance students' learning experiences by providing opportunities to explore scientific concepts in a virtual space.

The project design is based on the Year 5 science curriculum, enabling teachers to implement teaching and learning activities on various topics, such as the human skeletal system, matter, simple machines, electric circuits, moon phases, animals' food chains and food webs, planets, and more. This learning platform allows both teachers and students to access videos, images, graphics, and 3D models that have been customized according to each topic. Users can also interact with characters in the scene through text and sound. Then, a simple quiz can be integrated into the scene to enhance its value by testing students' knowledge.

Additionally, the teacher can guide students in exploring the virtual environment, where they can experience and interact with their surroundings, viewing 3D objects that are partially animated, such as the moon, the human skeletal system, the Rafflesia flower, various plants, animals, vehicles, and much more, which will bring excitement to them.

VISUALS

The visual component of the project features a user-friendly interface where educators integrate virtual reality environments for teaching and learning in the science subject. The screenshot highlights various VR elements, including interactive 3D models, designed to enhance student engagement and understanding. This visual demonstrates how the platform uses VR technology to support interactive and engaging science lessons.



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Figure 1. Screenshots of the application visuals

NOVELTY AND UNIQUENESS

This project stands out due to its innovative use of VR technology in primary education, specifically within the science curriculum. While VR has been employed in higher education and specialized training, its application in primary school settings, particularly for Year 5 students, is relatively new. The use of CoSpaces Edu offers a unique approach by combining educational content with immersive technology, allowing students to interact with and manipulate virtual objects and environments. This method not only aids in the understanding of abstract concepts but also fosters a more engaging and enjoyable learning experience compared to traditional methods.

BENEFITS TO MANKIND

The benefits of this project extend beyond the classroom, contributing to the broader goal of improving science literacy from an early age. By making Science Education more accessible and engaging, this project has the potential to inspire a new generation of scientists and innovators. Additionally, the use of Virtual Reality in education can help overcome learning barriers by providing all students, regardless of their physical environment, with the same immersive learning experiences.

COMMERCIAL POTENTIAL

The commercial potential of this project is significant, given the growing demand for Digital Tools that enhance traditional teaching and learning methods. CoSpaces Edu, with its scalability and ease of use, positions itself as a competitive product in the educational technology market. The platform's versatility allows it to be adapted to various educational settings and subjects, making it a valuable tool for schools worldwide. A potential business model could involve subscription-based access, with additional revenue streams from customized content development and teacher training programs.

CONCLUSION

In conclusion, integrating Virtual Reality into science education represents a promising advancement in the use of digital tools, such as CoSpaces Edu, to support the teaching and learning process, especially within a virtual reality environment. This project not only addresses the challenge of making abstract scientific concepts accessible to young learners but also paves the way for future innovations in educational technology. As virtual reality technology continues to evolve, its application in education is likely to expand, offering even

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more opportunities to enhance learning experiences across different subjects and age groups. Future research could explore the long-term impacts of VR on student learning outcomes and its potential integration into other areas of the curriculum.

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