UNIVERSITI TEKNOLOGI MARA

JIIICaS 2024
JOHOR INTERNATIONAL INNOVATION, INVENTION COMPETITION AND SYMPOSIUM

PROCEEDINGS OF JOHOR INTERNATIONAL INNOVATION INVENTION COMPETITION AND SYMPOSIUM 2024 (JIIICaS 2024)

"Flourish and Nurturing Sustainable Innovation for a Prosperous Nation"

JIICOS 2024
JOHOR INTERNATIONAL INNOVATION, INVENTION COMPETITION AND SYMPOSIUM

Editorial Board

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Preface

In the name of Allah, the Almighty who gives us the enlightenment, the truth, the knowledge and with regards to Prophet Muhammad (peace be upon him) for guiding us to the straight path. We thank to Allah for giving us guidance and strength to write this e-book.

This e-book compiles the extended abstracts that submitted to Johor International Innovation Invention Competition and Symposium 2024 (JIIICaS2024), where JIIICaS2024 is a virtual platform for all creative minds to share and present their invention and innovation. Each abstract gives a brief background on the innovation or project.

We hope that this e-book will help the readers to get to know the innovation done by the students and get some ideas to develop future innovation products.

Foreword Rector

Assalamualaikum warahmatullahi Wabarakatuh, Salam Sejahtera, Salam Malaysia MADANI and Salam UiTM Dihatiku.

In the name of Allah, the Most Gracious, the Most Merciful.

It is a great honor to welcome you to the Johor International Innovation, Invention, Competition, and Symposium 2024 (JIIICaS 2024). This event connects various disciplines, focusing on education and engaging educators, students, researchers, and innovators from all walks of life.

Innovation is not just about ideas; it demands perseverance, creativity, and determination to turn those ideas into reality. The remarkable projects showcased today highlight the dedication and spirit of all participants. Initiatives like this not only explore new technologies but also cultivate skills and leadership among our youth. At Universiti Teknologi MARA (UiTM) Johor Branch, we are fully committed to fostering a dynamic culture of innovation, promoting the commercialization of new products, and encouraging meaningful collaborations with industry and society.

As we celebrate this event, I would like to extend my heartfelt gratitude to all sponsors, judges, the College of Computing, Informatics and Mathematics, UiTM Pasir Gudang Campus as the event organizer, as well as to the researchers and participants for their hard work in making this event a success. Let us continue striving for innovation and excellence. May the ideas presented today inspire us and lay the groundwork for future achievements.

Thank you.

Associate Professor Dr. Saunah Zainon
Rector
Universiti Teknologi MARA (UiTM)
Johor Branch

(A-ST075) CREATIV-AR APPS: STEM MODEL BASED LEARNING ON AUGMENTED REALITY DRIVEN-TECHNOLOGY

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ABSTRACT

The integration of innovative technology in modern education has revolutionised the conventional educational framework. Modern technology overlays digital information like audio, video, and graphics on top of real-world environments through the usage of augmented reality (AR) and programming-based teaching and learning. Furthermore, its usefulness can be used to science, technology, engineering, and mathematics (STEM) education as well as technical and vocational education. While AR has been shown to have great educational potential by numerous researchers, there has been limited empirical study investigating its incorporation into STEM education for this type of cutting-edge technology inquiry. Finding the best augmented reality technology for STEM education in accordance with national educational compatibility is necessary. Therefore, the purpose of this study is to determine the AR technology that appropriate for STEM education. Its goal is to improve pupils' capacity for creativity, critical analysis, and problem-solving, in order to develop the Creativ-AR as a model-based in STEM education. This research begins over preliminary analysis, through the qualitative survey to investigate the needs of the students and teacher. Plus, interview session with the practioners also conducted to gather the module contents associated to STEM curriculum. The design and development of the Creativ-AR started by determination of the type of AR that match to module content through the details story board, 3D simulation model and programming using Unity and Blender. The module contents also verified and validated by the expert in this area. As a result, the Creativ-AR prototype is totally accepted and get positive feedback from students and teacher on the prototype demonstration, including critical thinking abilities and improving STEM education as a whole. The findings of this study could have a big impact on how useful teaching methods and resources are created for incorporating augmented reality into STEM curriculum.

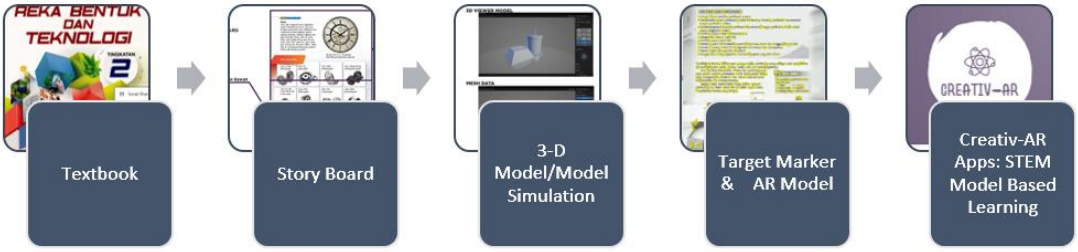
Keywords: Virtual Reality, Augmented Reality, Innovation, Advanced Technology, Revolution

PRODCUCT DESCRIPTION

Creativa revolutionizes STEM education in secondary schools with its innovative Augmented Reality (AR) technology. Specifically designed for RBT (Technology Design) subjects, this smart application serves as an invaluable teaching aid, enhancing both the teaching and learning experiences. By utilizing AR, Creativa transforms static RBT textbooks into dynamic, interactive learning tools. With just a smartphone, students and teachers can bring textbook objects and diagrams to life in

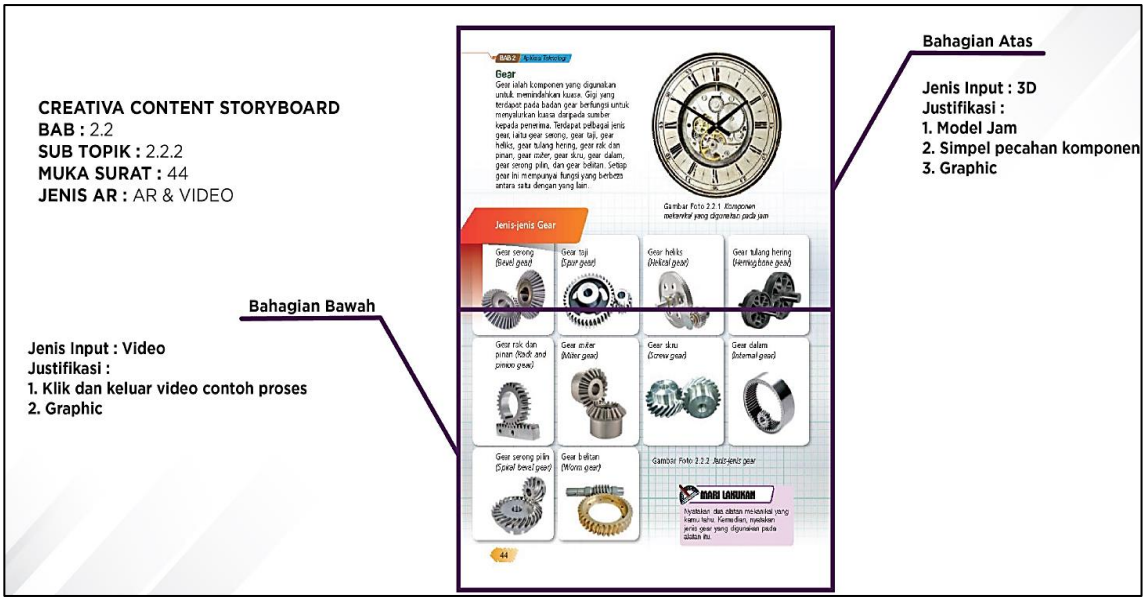
stunning 3D animations, providing a deeper understanding of complex concepts and fostering a more engaging educational environment.

DIAGRAM/FLOW PROCESS/SCREEN SHOT AND RELATES VISUAL

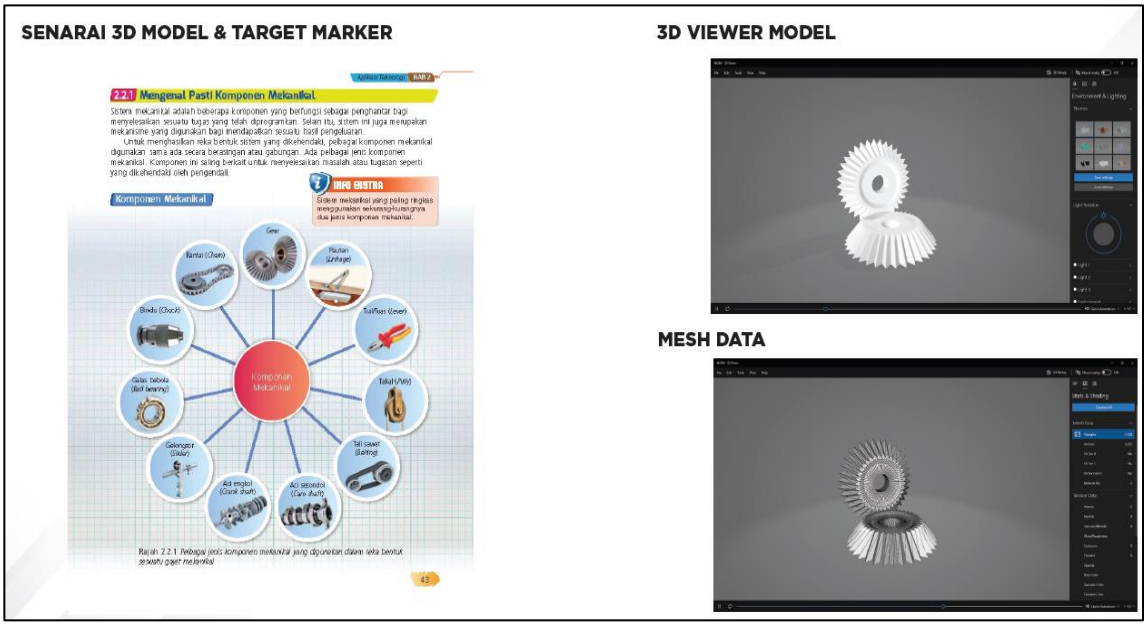


Flow process of the Creati-AR Apps development

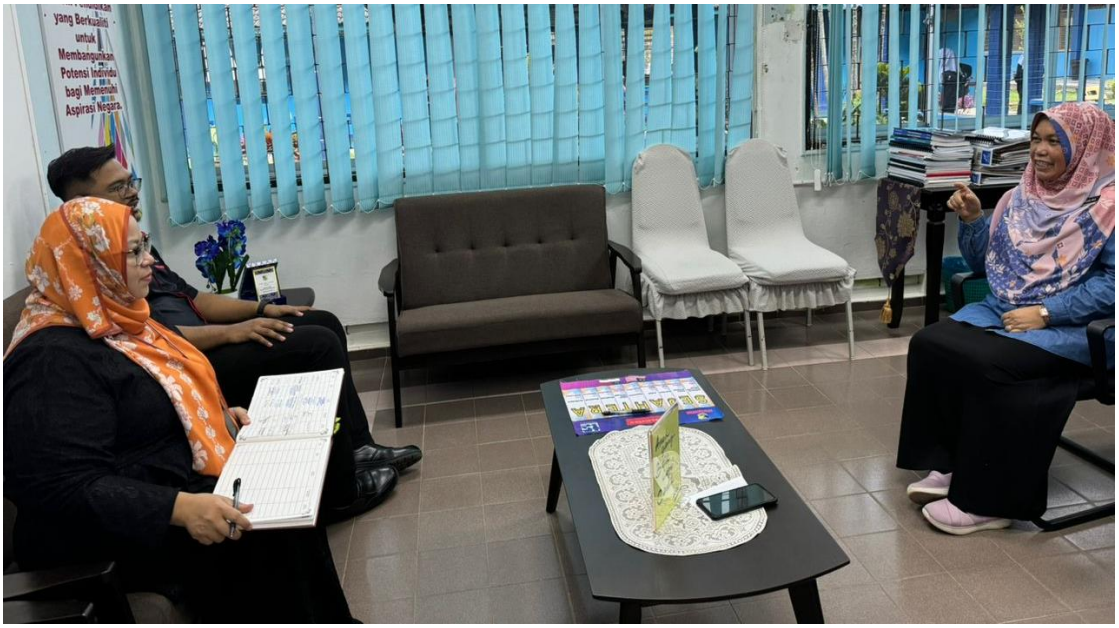
STEM based learning for Form 2 Textbook (RBT subject)



The story board for Topic 2 ‘Rekabentuk Mekanikal’



The 3D simulation for Topic 2.2 ‘Rekabentuk Mekanikal’ page 43



Meeting discussion in collaboration with Pengetua SMK Dato Haji Talib Karim

Use of Creativ-AR apps on the RBT textbook using smartphone

BENEFITS

1. Enhanced Visualization: Provides clearer, more vivid representations of RBT concepts, improving comprehension and retention.
2. Engaging Learning Environment: Increases student motivation and participation through interactive and immersive learning experiences.
3. Accessible Anytime, Anywhere: Enables learning beyond the classroom, supporting flexible and remote learning scenarios.
4. Personalized Learning: Accommodates diverse learning styles with customizable content and interactive features.
5. Improved Teaching Efficiency: Helps educators explain complex topics more effectively and efficiently, saving time in lesson preparation.

COMMERCIALIZATION POTENTIAL

The development of this apps, Ceativ-AR is very suitable in supporting and realizing the MARA Strategic Plan (PSM) 2021-2025 and Malaysia Agenda for Sustainable Development (2030 Agenda), covering one of the main cores SGD 4: Quality Education.

The development of this KidcadTech-Creativa kit model will implement the STEM-based national curriculum, applying cutting-edge technologies such as AR, VR, robotics and Adruino, EV3 and Scratch code & programming in the Lego Spike application which is starting to become the focus of parents and consultants in the field robotics and technical.

CONCLUSION

In conclusion, the integration of augmented reality-based modules in STEM education demonstrated significant potential in enhancing student engagement, improving learning outcomes, and fostering creativity, critical thinking, and problem-solving skills. This research provides a strong foundation for further exploration and implementation of augmented reality technology to transform STEM education practices and outcomes.

Comprehensive exposure in augmented reality technology will creates skills and educated students workforce with digital and cutting-edge knowledge in line with the current situation that prioritizes digitization, the exploration of knowledge without borders, lifelong learning and the generation of a high-income society.

ACKNOWLEGMENT

We express our deepest appreciation to everyone involved, especially the teachers of SMK Dato Haji Talib and UniKL who always provide support and cooperation for us to realize this innovation project.

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