i-SPiKE 2023

INTERNATIONAL EXHIBITION & SYMPOSIUM ON PRODUCTIVITY, INNOVATION, KNOWLEDGE & EDUCATION

"Optimizing Innovation in Knowledge, Education and Design"

EXTENDED ABSTRACT

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Assalamualaikum warahmatullahi wabarakatuh,

First and foremost, I would like to express my gratitude to the organizing committee of i-Spike 2023 for their tremendous efforts in bringing this online competition a reality . I must extend my congratulations to the committee for successfully delivering on their promise to make i-Spike 2023 a meaningful event for academics worldwide.

The theme for this event, 'Optimizing Innovation in Knowledge, Education, and Design,' is both timely and highly relevant in today's world, especially at the tertiary level. Innovation plays a central role in our daily lives, offering new solutions for products, processes, and services By adopting a strategic approach to 'Optimizing Innovation in Knowledge, Education, and Design,' we have the potential to enhance support for learners and educators, while also expanding opportunities for learner engagement, interactivity, and access to education.

I am awed by the magnitude and multitude of participants in this competition. I am also confident that all the innovations presented have provided valuable insights into the significance of innovative and advanced teaching materials in promoting sustainable development for the betterment of teaching and learning. Hopefully, this will mark the beginning of a long series of i-Spike events in the future.

It is also my hope that you find i-Spike 2023 to be an excellent platform for learning, sharing, and collaboration. Once again, I want to thank all the committee members of i-Spike 2023 for their hard work in making this event a reality I would also like to extend my congratulations to all the winners, and I hope that each of you will successfully achieve your intended goals through your participation in this competition.

Professor Dr. Roshima Haji Said
RECTOR
UiTM KEDAH BRANCH

WELCOME MESSAGE (i-SPiKE 2023 CHAIR)

We are looking forward to welcoming you to the 3rd International Exhibition & Symposium on Productivity, Innovation, Knowledge, and Education 2023 (i-SPiKE 2023). Your presence here is a clear, crystal-clear testimony to the importance you place on the research and innovation arena. The theme of this year's Innovation is "*Optimizing Innovation in Knowledge, Education, & Design*". We believe that the presentations by the distinguished innovators will contribute immensely to a deeper understanding of the current issues in relation to the theme.

i-SPiKE 2023 offers a platform for nurturing the next generation of innovators and fostering cutting-edge innovations at the crossroads of collaboration, creativity, and enthusiasm. We enthusiastically welcome junior and young inventors from schools and universities, as well as local and foreign academicians and industry professionals, to showcase their innovative products and engage in knowledge sharing. All submissions have been rigorously evaluated by expert juries comprising professionals from both industry and academia.

On behalf of the conference organisers, I would like to extend our sincere thanks for your participation, and we hope you enjoy the event. A special note of appreciation goes out to all the committee members of i-SPiKE 2023; your dedication and hard work are greatly appreciated.

Dr. Junaida Ismail
Chair
3rdInternational Exhibition & Symposium Productivity, Innovation, Knowledge, and Education 2023 (i-SPiKE 2023)

XPLORASI3D 2.0 : ALTERNATIVE SELF INSTRUCTION MATERIAL (SIM) IN VIRTUAL REALITY FOR SCIENCE

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ABSTRACT
XPLORASI3D 2.0 is a Digital Game-Based Learning (DGBL) based on 3D Virtual Reality to help lower secondary students learn science subjects. It is challenging for teachers to teach digital native students to engage with the learning process that needs creative ways to attract students. These issues require the development of a new method of teaching and learning to improve students' interests and motivations, especially in the involvement of the 3D Virtual Reality software. XPLORASI3D 2.0 is a PC game that uses a computer, keyboard, mouse, or game pad as a controller.

Key words: Virtual reality, Digital Game-based Learning, Science education

INTRODUCTION

Development in the form of games or edutainment is also an option for the production of learning modules. Edutainment refers to the combination of education and entertainment. Edutainment can help students improve cognitive ability, the feeling of wanting to explore something new and able to improve critical skills that are important for students, such as gross and fine motor skills as well as innovative, critical and creative skills (Mohid, Nadhira, Rushdi, & Ramli, 2017). Digital games use various digital technologies such as computers, consoles (handheld) and mobile devices. Digital Game-Based Learning can be an alternative method in the teaching and learning process (Chong, 2021).

Game-based learning strategies are closely related to Cognitive Constructivism Learning Theory by Piaget and Socialism by Vygotsky (Sharif, 2022). The development of learning models is not only through the use of pedagogy but also needs to be integrated with technological approaches. The integration of technology in learning is a way that supports pedagogical innovation; various educational institutions around the world spend a lot on integrating technology to improve the quality of pedagogical practice (in the production of teaching materials) (Ying, Hee, & Piaw, 2017).

The virtual world opens a new chapter in the world of education that allows the real- world environment to be simulated in a virtual reality environment that approaches the real world (Grivokostopoulou, Perikos, Kovas, & Hatzilygeroudis, 2016). Virtual reality allows users to

immerse themselves in an artificial world, creating visual, auditory and tactileexperiences using a computer, a special helmet or google (Chudikova & Faltejsek, 2019). Virtual labs can increase students' awareness, interest and knowledge about renewable energy(Guo, Abdul, Vengalil, Wang, & Santuzzi, 2022).

CONTENT

Xplorasi3D 2.0 consists of 5 Levels of the game, which can be selected from the Main Menu. When the player completes the level, the next level is unlocked. The player also can go to the quiz section using QUIZ MENU separately. The player moves to the checkpoint to collect cubes. The map helps the player to find checkpoints. Collect Blue Cube triggers to learning information (Knowledge). At the end of the game, the player collects Red Cube to Unlocked Next Level and goes to Quiz Section. The overall scores and points will be displayed on the scoreboard once the player has completed answering the quizzes. The player can hit Retry to repeat the questions.

The software is assisted by AI voice that serves as a valuable and guiding companion throughout the students' learning journey with the integration of XPLORASI3D 2.0. As students embark on their educational exploration, this AI voice will provide constant support, insights, and explanations, enriching the learning experience in numerous ways. Students will receive a comprehensive understanding of the subject matter, encouraging themto be proactive in their learning and fostering a deeper connection to the material.

Many digital games have been developed, but significantly fewer integrate fun with learning content, especially for science subjects. Using Self Instruction Material (SIM), students can control and engage with software with limited supervision by the teacher. The software application is based on computer games that can be played using a gamepad or keyboard and mouse on a laptop or desktop.

The application of the learning software can increase the engagement, interest and motivation of students during the process of teaching and learning. The development of XPLORASI3D 2.0 brings new perspectives not only to the users of the latest technology in the education system but also can create a new future career for individuals aware of the technology's abilities in the development of 3D learning environments and the design of game assets.

XPLORASI3D 2.0 was launched on STEAM on September 28, 2022, and made available for download through the STEAM App (desktop). As a renowned platform, STEAM actively promotes and sells digital game products. XPLORASI3D 2.0, priced at RM51, offers a competitive option compared to other games in the market. This strategic pricing ensures that learners and educators can access this innovative educational tool at an affordable rate, making it an exciting addition to the STEAM gaming community.

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