

MELAKA  
INTERNATIONAL  
INTELLECTUAL EXPOSITION

# MIIEX'24

12 JUNE '24

Dewan Taming Sari,  
Universiti Teknologi MARA Caw. Melaka,  
Kampus Alor Gajah, Melaka

*"Empowerment of Special  
Needs through Invention  
& Innovation"*

**EXTENDED  
ABSTRACT**

# MiiEX'2024

**MELAKA INTERNATIONAL INTELLECTUAL EXPOSITION 2024**

**“EMPOWERMENT OF SPECIAL NEEDS THROUGH INVENTION AND  
INNOVATION”**

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UiTM Cawangan Melaka

KM26 Jalan Lendu,

78000 Alor Gajah

Melaka Bandaraya Bersejarah

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**MELAKA INTERNATIONAL INTELLECTUAL EXPOSITION 2024**

**“EMPOWERMENT OF SPECIAL NEEDS THROUGH INVENTION AND  
INNOVATION”**

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## **FOREWORD BY THE RECTOR OF UiTM CAWANGAN MELAKA**



**Professor Ts. Dr. Mohd Rasdi bin Zaidi**

**Rector, Universiti Teknologi MARA (UiTM)**

**Cawangan Melaka**

Welcome to the Melaka International Intellectual Exposition 2024 (MIIEX '24). It is an honour for me, on behalf of UiTM Cawangan Melaka, to thank all of you for joining MIIEX '24. We are proud to inform you that this is the 13th consecutive year that UiTM Cawangan Melaka is organizing this exposition. Since 2009, UiTM Cawangan Melaka has successfully hosted this innovation exposition. Not only have we succeeded in organizing the exposition, but we have also successfully embarked on commercialized products.

2024 is a special year where MIIEX 2024 emphasizes the development of special needs. As we know, special needs indicate a limitation in a person's ability to engage in and benefit from various aspects, such as daily activities and education. Hence, with the theme "Empowering Special Needs Through Invention and Innovation," it is a platform for industries, professionals, academicians, students, and communities to share their innovative ideas and products to increase accessibility for those with special needs.

The successful implementation of MIIEX '24 is our joint success. This event was supported by the Melaka state government through YB Datuk Fairul Nizam bin Roslan, the EXCO of Science, Technology, Innovation, and Digital Communication. I also want to express my

gratitude to Universitas Negeri Padang, Indonesia, Universitas Muhammadiyah, Makassar, Indonesia, the International Association of Economic and Businesses (IAEB), Universiti Sains Islam Malaysia, Ibnu Umami Maktum Research Center (UMMI), USIM, and The Southeast Asia Minister of Education Organization Regional Centre for Special Educational Needs (SEAMEO SEN) as our co-collaborators for MIIEX 2024.

The collaboration from various parties in MIIEX '24 is a platform that will improve cooperation and interweaving among industries, professionals, academicians, students, and communities in shaping their potential in developing innovation products. This exposition also serves as a platform to cultivate and uphold the nation's innovation culture by presenting new ideas and research by young people, especially from academia and universities. Indirectly, MIIEX '24 will encourage all inventors towards empowering Science, Technology, Engineering, and Mathematics (STEM), especially in primary and secondary schools.

The new digital landscape also inspires more innovation and new ideas that contribute to various activities, such as business and industries. As a university that encourages "Research and Innovation," we aim to foster more innovative products that benefit scholars, industries, and communities, addressing issues to improve our present and future life.

This exposition would never happen without dedication, teamwork, and commitment. A round of applause should be given to the committee teams, who are the backbone of this exposition. Their hard work, effort, and time made this exposition possible.

Finally, I would like to conclude this brief remark by thanking all the participants and stakeholders for joining the exposition. We hope that this collaboration never ends here.

Thank you.

## **FOREWORD BY THE DEPUTY RECTOR (RESEARCH & INDUSTRIAL LINKAGES)**



**Associate Professor. Dr. Nur Hayati binti Abd Rahman**

**Deputy Rector (Research & Industrial Linkages), Universiti Teknologi MARA (UiTM) Cawangan Melaka**

With much passion and privilege, let me warmly welcome all of you to the Melaka International Innovation Exhibition (MIIEEX), UiTM Cawangan Melaka's flagship event. I firmly believe that events such as these demonstrate the gradual evolution of this platform in terms of its significance and its governing principles within the sphere of learning and the broader scholarly society.

The theme for this year, "Empowering Special Needs Through Invention and Innovation," strongly connects to our mission of using research and technology to make a positive impact on the world we live in. Besides enforcing the message of diversity, this theme also reaffirms our focus on creating products to improve the lives of people with disabilities (PWDs). Such innovations are vital as only through focused constructive changes can society become more sensitive to the needs of all members.

MIIEEX allows researchers, students, and industry professionals to come together, share their innovative research, and develop viable research partnerships. It has been great to see the enthusiasm of the participants and the efforts they put into their projects, which can offer various social and economic benefits. This is why one can state that MIIEEX is a great

opportunity for creating connections between the academic environment and industry, facilitating the implementation of innovative and promising projects.

Finally, I would like to express my sincere appreciation to all the members and supporters of the organizing committee, all the participants, sponsors, and everyone involved in preparing this event. I want to express my gratitude for your commitment and involvement, as the success of MIIEX and the development of an active culture of innovation in our university and beyond is partly owed to your support.

Thank you



## **FOREWORD BY THE PROJECT DIRECTOR**



**Dr Zulkefli bin Muhamad Hanapiyah**

**Senior Lecturer**

Assalamualaikum and Warmest Greetings,

It gives me a great pleasure, on behalf of the organizing committee, to welcome all participants and speakers to the Melaka International Intellectual Exposition 2024 (MIIEX '24) with the theme "Empowering Special Needs Through Invention and Innovation." We are honoured and pleased to welcome all participants to this biennial event.

MIIEX '24 is a platform that gathers experts from local and international industries, academia, scientists, researchers, and the community to contribute to the advancement of scientific and technological knowledge. This knowledge helps develop disruptive innovation products that improve daily activities for businesses and the community, especially those with special needs.

MIIEX '24 provides an atmosphere for inventors of all levels to gain new exposure and collaborate. Indirectly, this promotes a collaborative and innovative culture that focuses on cutting-edge technologies and new standards in technology and creativity.

MIIEX '24 is anticipated to serve as an arena for participants to acquire and disseminate revolutionary information on ideas and innovation. It is intended that the competition will expose the contestants' minds to the latest technologies and designs, aligning with the government's goal of encouraging innovation in Malaysia.

Finally, I want to compliment my fellow committee members on their amazing efforts, which were vital to the event's success. In addition, I want to thank our co-organizers, event sponsors, and participants. Optimistically, we hope that all new knowledge discovered, invented, or innovated will lead us toward future sustainability.

Thank you.

**FOREWORD BY MELAKA STATE EXCO OF SCIENCE, TECHNOLOGY,  
INNOVATION AND DIGITAL COMMUNICATIONS**



**YB Datuk Fairul Nizam bin Roslan**

**Melaka State Exco of Science, Technology, Innovation and Digital Communications**

Welcome to the Melaka International Intellectual Exposition 2024 (MIIEX '24). It is an honor for me, on behalf of UiTM Cawangan Melaka, to thank all of you for joining MIIEX '24. We are proud to inform you that this is the 13th consecutive year that UiTM Cawangan Melaka is organizing this exposition. Since 2009, UiTM Cawangan Melaka has successfully hosted this innovation exposition. Not only have we succeeded in organizing the exposition, but we have also successfully embarked on commercialized products.

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This exposition would never happen without dedication, teamwork, and commitment. A round of applause should be given to the committee teams, who are the backbone of this exposition. Their hard work, effort, and time made this exposition possible.

Finally, I would like to conclude this brief remark by thanking all the participants and stakeholders for joining the exposition. We hope that this collaboration never ends here.

Thank you.

## MIIEX'24 ORGANISING COMMITTEE

COMMITTEE	NAME
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	RIDZUAN ADLI BIN AZIDIN
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	PN AFZAN NOR BINTI TALIB
	PN NUR HIDAYAH ZAINI
	CIK FARIHA AIZA BINTI RAMLY
	PN NURUL AIN BINTI MUSTAKIM
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	PN ZATUL HIMMAH BINTI ABDUL KARIM
	CIK MUNA KAMEELAH BINTI SAUID
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	SITI RAMIZAH JAMA
	SITI NURSYAHIRA ZAINUDIN
	BUSHRA ABDUL HALIM
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	AFZAN SAHILLA BINTI MOHD AMIR HAMZAH
	MUHAMMAD FURQAN BIN AZHAR
	KHAIRUL AZHAR BIN LOCHMAN



## **ABOUT MIIEX'24**

MIIEX'24 is an innovation competition annually organised by UiTM Melaka with the intention to bring together ideas and inspiration that could fit in for commercialization needs.

This event creates a platform for researchers to establish networking, partnership and opportunities to collaborate with industries.

## **OBJECTIVES**

1. Encourage and instil passion towards inventing and innovating among UiTM Cawangan Melaka staff, students and academicians of local and international higher education institutions;
2. Highlight distinguished talents of skilful inventors and exhibit intellectual products, inventions and innovations among local and private tertiary institutions, government and private agencies, including international participants;
3. Become an effective Business Matching platform for participating research products, matching industries and partnering government agencies;
4. Recognise, inspire and promote invention and innovation products to be patented and commercialized;
5. Increase passion towards inventing and innovating through research and boost interests of government and non-government agencies to obtain consultancy services from a line up experts of higher education institutions and UiTM Cawangan Melaka.

## **THEME**

**'EMPOWERMENT OF SPECIAL NEEDS THROUGH INVENTION AND INNOVATION'**

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## **Virtual Reality Tool For Teaching And Learning Human Anatomy In Secondary School**

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### **Abstract**

The way of learning human anatomy has undergone significant changes in school curricula over time. Conventionally, the students had to understand and memorize what they have been taught only from books, which was tedious and ineffective. Hence, traditional learning often fails to convey the three-dimensional nature of human anatomy, making it challenging for students to understand and stay engaged. To improve the memorizing like approach, the advancements in virtual reality (VR) technology have been revolutionized the way of learning human anatomy in realistic way. This research focuses on developing a new VR-based educational tool, "Humanatomy VR, " designed to teach secondary school students. The tool offers an immersive and interactive learning experience, enabling students to explore anatomical structures in a three-dimensional environment with detailed explanations. Humanatomy VR offers a unique and innovative approach to teaching, surpassing the limitations of traditional methods to encourage student motivation, It was designed based on storytelling techniques to provide a memorable and engaging learning experience. The tool was assessed using System Usability Scale questionnaires, and positive feedback was obtained. With an average score of 86.25%, students found it accessible and enjoyable. Future recommendations include the compatibility of the tool with various devices, including more engaging content such as interactive tutorials and chats driven by the players.

**Keywords: Anatomy Education, Virtual Reality, Interactive Learning, Educational Technology**

## 1. INTRODUCTION

Anatomy is often considered the foundation of medical sciences, yet it remains a challenging and demanding subject in secondary and medical schools. In the past, anatomy instruction was characterized by tediousness, time-consuming efforts, and rote memorization. However, contemporary philosophies, approaches, and teaching strategies have transformed the teaching of anatomy. The development of the internet as an information superhighway has been a significant driver of technology's astonishing advancement of humanity (Lobna et al., 2023; Scwab & Davis, 2018). The imminent arrival of the fourth industrial revolution has made it possible to advance communication speed and facilitate information exchanges and business dealings within the space of a millisecond, which is nothing short of phenomenal. The impact of technology development has directly and indirectly influenced the modification and creation of instructional pedagogies and social improvements in most countries worldwide.

Formal education in the past was primarily teacher-oriented, making face-to-face interaction more suitable for classrooms. However, with the increase in technology tools and accessibility, classrooms that combine in-person instruction with electronically mediated learning have become increasingly widespread. "Flipped classrooms" where the pedagogy is mainly student-centered, are another current teaching strategy widely seen (Bontly et al., 2019; Cheng & Weng, 2017). Consequently, practitioners and scholars in tertiary education are tenacious in their pursuit of knowledge about and exploring ways to utilize 21st-century Higher Education 4.0 technology to enhance and improve the teaching and learning dyad (Ahmad et al., 2019).

This study aims to consider the resources and teaching strategies that must be integrated into an anatomy curriculum to provide a better learning experience. More robust sensory experiences and an active learning and teaching approach will efficiently encode the information presented. This may entail adding more pertinent visuals, using various manipulative models and specimens, or repeatedly presenting the same information in various contexts. Recent technological advancements have impacted the resources available for teaching anatomy. Computer-assisted learning tools like digital imaging and 3D modeling, video resources, augmented reality, and virtual reality are new technology-based teaching resources (Liu et al., 2022). The benefit of technology-assisted learning is that it allows students

to use the resources at their own pace. Moreover, it can be used anywhere without expensive facilities, unlike conventional resources, which are only accessible within the anatomy laboratory. This initiative serves to enlighten individuals about human anatomy while promoting increased engagement and comprehension by enhancing their understanding of the 3D nature of anatomy.

## **2. OBJECTIVE**

The goal of this endeavor is to enhance the teaching and learning of human anatomy in recent secondary schools by departing from conventional memorization tactics to embracing captivating and immersive approaches utilizing virtual reality (VR) technology. The aim of this study is to develop and assess HumanatomyVR, a VR-based educational tool crafted for high school students learning environment. The HumanatomyVR tool offers an interactive and immersive learning experience, enabling students to explore the anatomical structures in a three-dimensional environment. HumanatomyVR has employed a dream storytelling as a method to impart a lasting and engaging learning experience for students that surpasses traditional teaching methodology.

## **3. NOVELTY & INVENTIVENESS**

The field of anatomy education is on the cusp of a revolution, thanks to innovative VR technology. A team of researchers has designed an immersive virtual environment that offers a fresh approach to teaching human anatomy, departing from old-fashioned memorization techniques. This remarkable creation, known as HumanatomyVR, demonstrates the ingenuity of leveraging technology to overcome the obstacles of effectively conveying the complex 3D structure of human anatomy. By providing a dynamic and interactive learning environment, this inventive use of VR technology enhances student engagement and delivers a one-of-a-kind educational experience.

#### **4. PRACTICALITY & USEFULNESS**

The practicality and usefulness of integrating VR technology into secondary school education has been demonstrated through a research project. Form Three students, aged 15, at Sekolah Menengah Kebangsaan Putrajaya Presint 16 (1) provided positive feedback, giving an average SUS score of 86.25%. This indicates that the VR-based educational tool is accessible, enjoyable, and engaging for students. Additionally, the VR technology provides a safe and controlled environment for learning, allowing students to interact with anatomical structures in a hands-on manner and potentially enhance their learning outcomes. Overall, this research showcases the potential benefits of incorporating VR technology into secondary school education.

#### **5. CONCLUSION**

The HumanatomyVR study has made a remarkable contribution to science education, particularly in the area of human anatomy instruction. Through the use of VR technology, the researchers have created a stimulating and interactive learning platform that successfully addresses the limitations of traditional teaching methods. The overwhelmingly positive feedback from students, combined with the emphasis on engagement, comprehension, and practical application, underscores the effectiveness and potential impact of incorporating HumanatomyVR into secondary school curricula. This research sets the stage for future advancements in educational technology and highlights the crucial role of innovative approaches in enhancing learning experiences.

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