

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

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78000 Alor Gajah

Melaka Bandaraya Bersejarah

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MiiEX'2024

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 (MIIEX), 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.

MIIEX 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 MIIEX 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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Thank you.

MIIEX'24 ORGANISING COMMITTEE

COMMITTEE	NAME
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	DR NORASHIKIN ADAM
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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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The Support Board: Treatment Without Transfer

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Abstract

In providing care for patients with special healthcare needs, physical access to the dental chair is imperative for better treatment provision. However, this has always been a challenge especially for patients who are physically impaired like wheelchair users. Most situations would require patients to be transferred from their wheelchair to the dental chair which poses multiple risks and potential harm to the patient, as well as the dental staff or caregiver. This innovation aims to enable dental treatment to be provided without requiring the patient to be transferred thus minimising injury risk for all stake holders. Unlike expensive reclining platforms with headrests, The Support Board design provides a backrest that seamlessly integrates with the patient's own wheelchair and allows the patient to lean comfortably while receiving dental care. Besides that, this posture-supporting device also provides comfort to the patients, as the adjustable head rest may be able to cater to individuals of different heights. Therefore, this innovation will improve the accessibility for individuals who rely on wheelchairs in obtaining dental treatment. In addition, this innovation minimises the threat of occupational hazards that could occur when transferring patients from the wheelchair to the dental chair. This solution for wheelchair users within dental practice settings has a high potential for commercialisation as the support board fits the standard-sized wheelchair, is lightweight and easy to store due to its size and shape and is made of materials that can be sterilised using hospital-grade disinfectant wipes. The ability for this innovation to enhance accessibility for wheelchair users even to obtain treatment in home settings and prevent occupational hazards is highly marketable, while allowing for better dental management of patients with special healthcare needs to dental care without compromising their comfort.

Keywords: accessibility, patients with special health care needs, physical barriers, physical impairment.

1. INTRODUCTION

Previous studies have noted that one of the main barriers in accessing dental health care for patients with special health care needs is physical accessibility (Da Rosa et al., 2020; Khan et al., 2022). Physical accessibility can be divided into four different categories which are access to the building, dental surgery, dental chair, and mouth (Dougall & Fiske, 2008). Some of the wheelchair users can transfer themselves to the dental chair independently or with the help of a transfer board, hoist, or their caregiver. In the dental clinic, staff are not advised to assist with transferring patients as it may cause injury to both the patient and dental staff. In addition, some patients are not encouraged to be transferred on to the dental chair such as those with high fracture risk or those who are morbidly obese (Dougall & Fiske, 2008). In these cases, the dental treatment should be done on the wheelchair which may cause discomfort to the patient and the dental team. Common issues faced during treatment on the standard wheelchairs are strain on their neck as there is no headrest to support their head during long treatments thus causing fatigue and high stress to the patient (Garbin et al., 2015).

2. OBJECTIVE

The Support Board aims to enable certain dental treatments to be done comfortably for wheelchair users, without having to transfer them to the dental chair.

3. NOVELTY & INVENTIVENESS

Innovation for patients who should not be moved from their wheelchair such as manual or electronic controls reclining platform with integrated headrest have been introduced (Dougall & Fiske, 2008). However, they are expensive and more suited in a specialist setting where more patients on wheelchair are seen. The Support Board is a more affordable tool that allows for dental procedures to be done without the risk of harming the patients during transfer. This innovation differs from other products currently used or marketed as the neck support height can be adjusted according to the height of the patient. Besides that, the use of a simple backrest diminishes the feeling of fear which is commonly faced by patients when using mechanical recliners.

4. PRACTICALITY & USEFULNESS

The Support Board is made with a lightweight plywood backrest wrapped in a leather cover. It is modified with an adjustable neck extender comprising of an aluminium frame integrated with a soft and inflatable neck support pillow to further assure comfort during dental procedures. The backrest allows patients to lean on the board, with shoulder support while the neck pillow prevents the patient from tilting or leaning their head making them more stable. As for the size of the innovation, it is designed to fit standard wheelchair frames therefore making it compatible for most models commonly used. In terms of sterility, the use of a leather cover over the backrest allows for it to be easily sterilised using standard hospital-grade disinfectant wipes. As for the neck rest, it is detachable and can be washed after every use. In addition, due to its sleek design, this device is easy to store and can be brought along during home visitations for mobile dental treatment making it a good addition to any dental practice especially for special care dentists.

5. CONCLUSION

The Support Board is an important innovation as it will improve the access of patients with special healthcare needs to dental care, which allows them to receive a broader range of dental treatments, without compromising their comfort.

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