

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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	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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Fairy Light Color

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Abstract

The Fairy Light Color product is an innovative educational tool designed to enhance the learning experience of children with hearing impairments. This tool integrates a 3D color wheel and lighted cat heads, providing a multisensory approach that is both engaging and educational. The 3D color wheel, inspired by the visually stimulating "Fairy Wheel" from theme parks, serves as a practical model to demonstrate the relationships between primary and secondary colors. This interactive model not only visually engages students but also allows them to manipulate and explore the color spectrum in an intuitive and enjoyable manner. Preliminary studies indicate that these innovative tools significantly enhance the learning experience by increasing engagement and deepening understanding of color concepts among children. By transforming passive learning into an active discovery process, the Fairy Light Color product aims to foster not only cognitive development but also creative thinking and problem-solving skills. This introduction of interactive and visually stimulating educational tools represents a significant advancement in special needs education, promising to make learning not only more accessible but also more compelling for children with hearing impairments. Through this innovation, we aspire to set a new standard in educational practices, ensuring that all children have the opportunity to learn and thrive in a manner that respects their unique needs and abilities.

Keywords: Color learning, interactive learning, special needs kids

1. INTRODUCTION

In the realm of educational development, particularly for children with special needs such as hearing impairments, traditional learning methodologies often fall short in capturing and maintaining their interest, especially in abstract concepts like color theory. Recognizing this gap, our team has developed an innovative educational tool designed to transform the way color education is approached and delivered. This tool leverages the captivating allure of interactive

technology combined with the fundamental principles of color learning to create a more engaging and effective educational experience.

The cornerstone of our innovation is the integration of a 3D color wheel and lighted cat heads, both of which are designed to provide a multisensory learning experience that is both enjoyable and educational. The 3D color wheel, drawing inspiration from the dynamic and visually stimulating "Fairy Wheel" found in theme parks, serves as a practical model to demonstrate the relationships between primary and secondary colors. This interactive model not only visually engages students but also allows them to manipulate and explore the color spectrum in a manner that is intuitive and fun.

Color learning is crucial for children's cognitive development, yet maintaining their interest and understanding can be challenging (Liang et al., 2023). To address this, innovative tools like 3D color wheels and lighted cat heads have been introduced to enhance color understanding for special needs children, particularly those with hearing impairments. The 3D color wheel, inspired by the "Fairy Wheel" concept, visually teaches primary and secondary color concepts in an engaging manner (Alekseieva et al., 2022). Additionally, the lighted cat head with colored lights in its eyes and mouth allows direct visualization of color effects, aiding in deepening children's comprehension of color incorporation Burdet R. et al. (2023). This innovative approach aims to make color learning more interactive and effective, fostering increased interest and understanding among children in an educational setting (Iryna, 2021).

2. OBJECTIVE

The primary objective of the Fairy Light Color innovation is to enhance the learning experience of children with special needs, particularly those with hearing impairments, by utilizing the educational and therapeutic benefits of color and light.

3. NOVELTY & INVENTIVENESS

Novelty

The Fairy Light Color product introduces two novel features that distinguish it from traditional educational tools:

- **3D Color Wheel Inspired by the "Fairy Wheel":** This feature transforms the abstract concept of color theory into a tangible and interactive experience. The 3D color wheel is not only visually stimulating but also allows children to physically engage with the color spectrum. By turning the wheel, students can mix primary colors to discover secondary

colors, providing a hands-on learning experience that enhances their understanding of color relationships.

- **Lighted Cat Heads with Color Effects:** The inclusion of a 2D cat's head with lights in its eyes and mouth introduces an innovative way to demonstrate color mixing. When different colored lights are activated, children can directly observe the resulting color changes. This feature is particularly effective for hearing-impaired students, as it relies on visual cues rather than auditory explanations, making the learning process more inclusive and accessible.

Inventiveness

The inventiveness of the Fairy Light Color product is evident in its design and educational impact:

- **Enhanced Sensory Learning:** By focusing on visual and tactile stimuli, the product caters to the strengths of hearing-impaired children, who often rely more heavily on their visual senses. This sensory-rich approach not only compensates for their auditory limitations but also promotes better retention and understanding of the material.

4. PRACTICALITY & USEFULNESS

The Fairy Light Color product is designed with practicality and usefulness at its core, offering an intuitive and user-friendly solution for special needs educators teaching color concepts to hearing-impaired children. Unlike conventional teaching aids that may not cater to the unique learning styles of these students, the Fairy Light Color product incorporates interactive 3D and light-based elements that are both engaging and accessible, thereby simplifying the teaching process and enhancing the educational experience. This tool is not only versatile, serving a wide age range of children in various educational settings, but it is also a cost-effective resource that eliminates the need for multiple teaching aids, making it an invaluable asset for educators striving to provide a comprehensive and inclusive learning environment.

5. CONCLUSION

The Fairy Light Color innovation stands as a groundbreaking educational tool that revolutionizes color learning for hearing-impaired children. By combining interactive 3D elements with sensory-rich light features, it captivates and maintains the interest of young learners, fostering a

deeper understanding of color theory. This product not only supports special needs educators in delivering more effective instruction but also represents a significant stride towards inclusive education, ensuring that every child has the opportunity to engage with and enjoy the learning process to its fullest potential.

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