

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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Segre-Bag: Revolutionizing Waste Management Through Innovative Segregation

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Abstract

Waste management in densely populated countries faces significant challenges due to rapid population growth. Among the crucial techniques, waste segregation stands out as a key strategy. In Malaysia, municipal solid waste, especially from offices and homes, has posed environmental concerns, notably with poorly managed plastic and paper waste. The lack of consumer motivation in waste sorting stems from the perceived time and labor intensiveness of segregation processes. This study focuses on evaluating the efficiency of Segre-Bag, an innovative waste segregation tool, in managing and separating trash at UiTM Pasir Gudang. Segre-Bag utilizes three colored plastic bags, each representing a specific type of waste as per Malaysia's government-issued color code for waste segregation. The aim is to streamline waste sorting, reducing time and energy for consumers both in office and household settings. Our findings demonstrate that Segre-Bag significantly aids consumers in simplifying waste segregation processes. By providing a user-friendly method aligned with established waste categories, Segre-Bag enhances waste management efficiency. This research contributes valuable insights into improving waste segregation practices, offering a practical solution to address environmental challenges associated with poorly managed waste streams, particularly plastic and paper waste.

Keywords: Waste Management, Waste segregation tools, Recyclable waste, Segre-Bag.

1. INTRODUCTION

The escalating global waste production rates have become a pressing concern. In 2020 alone, the world generated a staggering 2.24 billion tonnes of solid waste, equating to 0.79 kg of garbage per person daily. This figure is anticipated to surge to 3.88 billion tonnes by 2050, driven by urbanization and population surges. The repercussions of unsustainable waste management are notably severe in developing countries, especially for urban underprivileged communities. In such regions, over 90% of waste is either burned outdoors or deposited in unregulated dumps, posing grave environmental, public health, and safety risks (World Bank, 2022).

In Malaysia, the scenario is equally alarming. The early 2000s witnessed an average generation of 17,000 tonnes of municipal solid waste (MSW), steadily increasing due to population growth. This surge in waste, primarily destined for landfills, reflects a broader trend fueled by rampant consumption, rapid urban development, and dietary habits (Clean Malaysia, 2015). The looming population projection of 36.8 million by 2040 further compounds waste management challenges (DSM, 2011). To combat this crisis, Malaysia has instituted a new waste management policy, mandating recycling under penalty. Previous efforts with recycling bins failed due to public apathy, necessitating a more stringent approach (Clean Malaysia, 2015). The Mandatory Waste Separation Program now requires citizens to segregate recyclables, promising a 40% reduction in landfill-bound waste (NST, 2022).

Despite these measures, challenges persist at the consumer level, with local authorities grappling with inefficient waste management systems (Badgie et al., 2012). Enhancing consumer cooperation, improving organizational structures, and fostering education are crucial steps highlighted by experts (Moh et al., 2014). Considering these complexities, a solution like Segre-Bag offers promise. This innovative waste segregation tool can empower consumers to sort waste effectively, contributing significantly to Malaysia's waste management endeavors.

2. OBJECTIVE

The objective of this study, is to highlight Segre-Bag as an innovative waste segregation tool addressing the challenges posed by the growing population and waste management complexities. The focus lies in assessing Segre-Bag's efficacy in streamlining waste segregation processes, particularly in densely populated areas. Additionally, the study aims to

investigate how Segre-Bag reduces the time and labor required for waste sorting in various settings, including offices and homes. Furthermore, the environmental benefits of Segre-Bag in improving waste management practices and reducing plastic and paper waste contamination will be emphasized, showcasing its potential to contribute significantly to sustainable waste management solutions.

3. NOVELTY & INVENTIVENESS

Amidst a rising population and increased waste, effective waste management is crucial. Waste segregation is key, especially in Malaysia where traditional methods struggle to engage consumers. Enter Segre-Bag, a newly designed waste segregation tool that simplifies waste sorting like never before. This study explores Segre-Bag's efficiency at UiTM Pasir Gudang, highlighting its potential to motivate consumers and promote sustainable waste management.

4. PRACTICALITY & USEFULNESS

Segre-Bag streamlines waste sorting for consumers at home or in offices, tackling waste segregation issues. This innovative plastic bag fits standard trash cans and contains three compartments in different colors: blue for paper, orange for plastic, brown for glass and aluminum. (Bahagian Pendidikan Kesihatan, 2023). With detachable plastic strips, each compartment adjusts size based on waste volume (Ismail et al., 2018). Users can easily dispose of filled compartments, aiding environmental agencies such as Alam Flora in waste collection.

5. CONCLUSION

Early studies indicate that Waste Segregation Plastic Bags (Segre-Bags) have effectively sorted recyclable waste into three distinct categories: plastic, paper, aluminum cans, and glass. These plastic compartments simplify the process for consumers, enabling them to separate specific recyclables more easily. Segre-Bag shows great promise in streamlining waste separation across all consumer levels and supporting Malaysia's recycling initiatives. Further research is needed across various consumer settings, including homes, to fully assess its impact.

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