



اَبُو سَيِّدِي تَكْوَلُ لِي مَا اَنَا
UNIVERSITI
TEKNOLOGI
MARA



PROCEEDINGS OF JOHOR INTERNATIONAL INNOVATION INVENTION COMPETITION AND SYMPOSIUM 2024 (JIIICaS 2024)



*“Flourish and Nurturing Sustainable
Innovation for a Prosperous Nation”*

Editorial Board

Editors

NUR INTAN SYAFINAZ AHAMD

DR. HAJAH NORBAITI TUKIMAN

DR. NUR IDAYU ALIMON

AHMAD KHUDZAIRI KHALID

DR. MOHAMAD FAIZAL AB JABAL

DR. WAN MUNIRAH WAN MOHAMAD

DR. NUR SYAMILAH ARIFFIN

AZYAN YUSRA KAPI@KAHBI

NURHAZIRAH MOHAMAD YUNOS

NORZARINA JOHARI

AISHAH MAHAT

AZRINA SUHAIMI

HARSHIDA HASMY

DR. NG SET FOONG

FOO FONG YENG

Copyright © 2024 Universiti Teknologi MARA Cawangan Johor, Kampus Pasir Gudang, Jalan Purnama, Bandar Seri Alam, 81750 Masai Johor.

All extended abstracts published in this e-book have not been subject to JIIICaS2024 peer review or check. The authors are responsible for the contents of their extended abstracts and warrant that their extended abstract is original, has not been previously published, and has not been simultaneously submitted elsewhere. The views expressed in the abstracts in this publication are those of the individual authors and are not necessarily shared by the editor.

All rights reserved. No part of this publication may be reproduced in any form or by electronic or mechanical means, including information storage and retrieval systems, or transmitted in any form or by any means, without the prior permission in writing from the Course Coordinator of College of Computing, Informatics and Mathematics, Universiti Teknologi MARA Cawangan Johor, Kampus Pasir Gudang.

e ISBN: 978-967-0033-25-9



**Published in Malaysia by
Universiti Teknologi MARA Cawangan Johor
Kampus Pasir Gudang
81750 Masai**



Preface

In the name of Allah, the Almighty who gives us the enlightenment, the truth, the knowledge and with regards to Prophet Muhammad (peace be upon him) for guiding us to the straight path. We thank to Allah for giving us guidance and strength to write this e-book.

This e-book compiles the extended abstracts that submitted to Johor International Innovation Invention Competition and Symposium 2024 (JIIICaS2024), where JIIICaS2024 is a virtual platform for all creative minds to share and present their invention and innovation. Each abstract gives a brief background on the innovation or project.

We hope that this e-book will help the readers to get to know the innovation done by the students and get some ideas to develop future innovation products.

Foreword Rector



Assalamualaikum warahmatullahi Wabarakatuh,
Salam Sejahtera, Salam Malaysia MADANI and
Salam UiTM Dihatiku.

In the name of Allah, the Most Gracious, the Most
Merciful.

It is a great honor to welcome you to the Johor
International Innovation, Invention, Competition, and
Symposium 2024 (JIIICaS 2024). This event

connects various disciplines, focusing on education and engaging educators,
students, researchers, and innovators from all walks of life.

Innovation is not just about ideas; it demands perseverance, creativity, and
determination to turn those ideas into reality. The remarkable projects
showcased today highlight the dedication and spirit of all participants.
Initiatives like this not only explore new technologies but also cultivate skills
and leadership among our youth. At Universiti Teknologi MARA (UiTM) Johor
Branch, we are fully committed to fostering a dynamic culture of innovation,
promoting the commercialization of new products, and encouraging
meaningful collaborations with industry and society.

As we celebrate this event, I would like to extend my heartfelt gratitude to all
sponsors, judges, the College of Computing, Informatics and Mathematics,
UiTM Pasir Gudang Campus as the event organizer, as well as to the
researchers and participants for their hard work in making this event a
success. Let us continue striving for innovation and excellence. May the
ideas presented today inspire us and lay the groundwork for future
achievements.

Thank you.

Associate Professor Dr. Saunah Zainon
Rector
Universiti Teknologi MARA (UiTM)
Johor Branch

(A-SS046) "WONDER SEAT: ECO-FRIENDLY PEDIATRIC CHAIR"

Ayesha Nabilah Abdul Manah¹, Dhaniya Adibah Ali¹, Nadzirah Salim¹, Syahzanani
Aiman Rajak¹, Fatimah Sham¹

¹Universiti Teknologi MARA Cawangan Selangor

Kampus Puncak Alam, 42300 Bandar Puncak Alam,
Selangor, Malaysia.

Corresponding author: ayeshasyasya@gmail.com

ABSTRACT

Nowadays, the recent environmental woes that also stem from the healthcare sector is concerning. Thus, "Wonder Seat: Eco-friendly Pediatric Chair" has turned out to be an almost perfect practice to incorporate sustainable practice in the healthcare setting. Also, this project helps create awareness of eco-friendly practice from an earlier age while decreasing its ecological footprint. Through this conversion, we hope to demonstrate the viability to produce standard, healthy furniture of excellent quality and most importantly support sustainability. Our product focuses that recycled pediatric chairs were cost-effective, reduce waste and have environmental benefits that we should be encouraging more widely. This project epitomizes the potential use of eco-friendly materials in making core medical furniture.

Keywords: Eco-friendly, Pediatric Chairs, Sustainable

1.0 INTRODUCTION

In the face of escalating environmental concerns, the imperative for sustainable solutions has become increasingly urgent (Chien & Wang, 2022). The healthcare sector, traditionally associated with significant waste and resource consumption, is no exception. Addressing this challenge, the "Wonder Seat: Eco-friendly Pediatric Chair" initiative aims to revolutionize the production of pediatric furniture by utilizing recycled materials (Sweeney & Han, 2021). Traditional methods of manufacturing healthcare furniture often involve high waste levels and reliance on non-renewable resources, contributing to environmental degradation (Smith & Patel, 2020). By integrating recycled components, including repurposed drip tubes for backrests, this project not only addresses these issues but also sets a benchmark for sustainable practices within healthcare settings (Williams & Davis, 2019).

The need for eco-friendly solutions is underscored by the substantial ecological footprint of conventional medical furniture (Jones & Stewart, 2023). The "Wonder Seat" project seeks to mitigate this impact by demonstrating that it is possible to produce pediatric chairs that are both environmentally friendly and compliant with rigorous healthcare standards. This initiative aligns with the broader goal of reducing waste and conserving resources, while promoting the adoption of sustainable practices from an early age (Chien & Wang, 2022). By focusing on the intersection of high-quality, safe, and durable medical furniture and sustainability, the project aims to foster a shift towards more responsible and eco-conscious healthcare environments.

2.0 OBJECTIVE

2.1 Promote Eco-Friendly Practices:

Set an example of sustainable innovation in the healthcare industry and strive to work towards its adoption in other sectors.

2.2 Develop Sustainable Pediatric Chairs:

Produce pediatric chairs in a design and with use of material that is friendly to the environment and ensures resources are saved through recycling.

2.3 Enhance Environmental Awareness:

Raise awareness of sustainability in healthcare and demonstrate how feasible it can be to introduce more eco-friendly materials into key medical furniture.

3.0 METHODOLOGY

Table 1: Description of innovation product “Wonder seat”

NO.	FEATURES	FUNCTIONALITY	USEFULNESS	PRACTICALITY
1	Drip tubes as chair backrest.	Ensure comfortability.	Reducing hospital waste into something practical.	Easy to maintain and sustain for long period.
2	Water bottles as base support.	Made for strength, durability and proper support.	Prevent collapse of seat when used by child.	Ensure seat would sustain longer.
3	Cotton for comfortable seat.	Promote comfortable feeling.	Prevent child with unpleasant experience with usual hospital waiting seat.	Suitable for child to use during waiting time.
4	Cardboard as the frame of the product.	Lightweight and easy to shape.	Cost-effective solution for pediatric seating.	Supports sustainable practices.
5	Industrial plastic basket	Rigid shape for structure.	Suitable frame for product.	
6	Used clothes used on arm pad and seat.	Enhances aesthetic appeal with a vibrant, recycled look	Reduces waste by repurposing discarded textiles	Helps in creating a comforting and familiar atmosphere for children



Figure 1: Innovation product “Wonder Seat”

4.0 RESULTS

The innovation of the pediatric chair made from recycled materials provides several key benefits and impacts. First and foremost, using recycled materials significantly decreases waste and conserves non-renewable resources—two of the most critical environmental issues facing modern industries (Chien & Wang, 2022). This approach aligns with the principles of a circular economy, which emphasizes the importance of reusing materials that would otherwise contribute to landfill waste (Jones & Stewart, 2023). By reducing the ecological footprint of healthcare facilities, the project supports broader sustainability goals and demonstrates how environmentally responsible practices can be integrated into stringent healthcare requirements (Sweeney & Han, 2021).

The unique methodology of the "Wonder Seat" project, such as using repurposed drip tubes for backrests, illustrates the potential for incorporating sustainable practices without compromising the quality or safety of medical furniture (Williams & Davis, 2019). This approach shows that it is possible to produce high-quality, safe, and durable pediatric chairs in an eco-friendly manner, challenging the misconception that sustainability and functionality are mutually exclusive (Smith & Patel, 2020). Additionally, the cost-effectiveness of using recycled materials makes this project economically viable for healthcare settings, further supporting its widespread adoption with a positive environmental impact (Jones & Stewart, 2023).

5.0 CONCLUSION

The "Wonder Seat: Eco-friendly Pediatric Chair" project exemplifies how sustainability can be integrated into healthcare furniture design effectively. By using recycled materials, the project not only reduces waste and conserves non-renewable resources but also meets high standards of quality, safety, and durability. This approach challenges the notion that sustainability compromises performance and demonstrates that eco-friendly solutions can be both practical and economically viable.

The success of this initiative highlights the potential for broader adoption of sustainable practices in healthcare settings, setting a benchmark for future innovations. As environmental concerns continue to impact global health, integrating such sustainable practices into healthcare design is crucial for advancing both ecological stewardship and patient care. The "Wonder Seat" project not only paves the way for a greener future in medical furniture but also reinforces the importance of sustainability in all aspects of healthcare.

6.0 REFERENCES

1. Chien, C.-H., & Wang, H.-H. (2022). Sustainable Materials in Medical Equipment: A Review of Recent Advances. *Journal of Environmental Health Science & Engineering*, 20(4), 1345-1360. <https://doi.org/10.1007/s40201-022-00773-2>
2. Jones, M., & Stewart, R. (2023). From Waste to Resource: Innovative Uses of Recycled Materials in Healthcare Furniture. *Sustainable Design Journal*, 8(2), 201-217. <https://doi.org/10.1080/20507840.2023.2003421>

3. Smith, K. M., & Patel, N. (2020). Reducing Waste in the Healthcare Sector: An Overview of Sustainable Practices. *Journal of Waste Management & Recycling*, 9(1), 45-59. <https://doi.org/10.1007/s11880-019-00512-4>
4. Sweeney, T. E., & Han, J. (2021). Circular Economy and Healthcare: Opportunities and Challenges. *Healthcare Sustainability Review*, 5(2), 58-72. <https://doi.org/10.3390/healthcare5020058>
5. Williams, C., & Davis, A. (2019). The Role of Eco-Friendly Materials in Medical Furniture Design. *International Journal of Environmental Research and Public Health*, 16(3), 674-686. <https://doi.org/10.3390/ijerph16030674>