UNIVERSITI TEKNOLOGI MARA

EXTENDED ABSTRACT

DKA 2025

InVICCAID 2025
1ST INTERNATIONAL VIRTUAL COMPETITION OF CREATIVE ARTS & INNOVATIVE DESIGN IN TEACHING & LEARNING

MONDARIKA

NIAT
NORTHERN INNOVATION ACADEMIC TOUR

Design Innovation Academic Show 2025

Organized by

Faculty of Art & Design
#perubahanluarbiasa
#ADpilihanpertama

UNIVERSITI TEKNOLOGI MARA
Fakulti Seni Lukis & Seni Reka
Cawangan Kedah

UiTM di hatiku

Collaboration with

PUSAT SAINS NEGARA WILAYAH UTARA

KEMENTERIAN SAINS, TEKNOLOGI DAN INOVASI
MINISTRY OF SCIENCE, TECHNOLOGY AND INNOVATION

EXTENDED ABSTRACT

'Design Innovation Academic Show 2025

DIAS 2025 (Design Innovation Academic Show) is all about "Transcending the Boundaries of Creativity: Innovation in Art & Design for 21st Century Education." This vibrant program shines a spotlight on how creativity and innovation are reshaping modern education.

It consists of three key components. First up is the Mindareka Design Show, an exhibition that showcases students' final year projects and creative designs, giving them a chance to connect with industry professionals and the wider community. Next, we have the Northern Innovation Academic Tour (NIAT), which takes participants on an academic adventure to select institutions and innovation centers in the northern region, aimed at promoting knowledge sharing and building strong academic and professional networks.

Finally, there's the 1st International Virtual Competition of Creative Arts & Innovative Design in Teaching & Learning (InViCCAID), a global competition that recognizes outstanding practices in teaching and learning by blending art, technology, and innovative design. But DIAS 2025 is more than just a talent showcase; it's a powerful platform for empowering both students and educators, while also strengthening collaborations between universities, creative industries, and global communities. With its inclusive and interdisciplinary approach, this initiative strives to spark relevant, competitive, and impactful ideas and innovations that truly benefit society and push the future of education forward.

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Design Innovation Academic Show 2025

Prof. Dr. Roshima Haji Said
Acting Rector
UiTM Kedah Branch

Rector's Message

I am delighted to extend my heartfelt congratulations to the College of Creative Arts, UiTM Kedah Branch, for bringing MINDAREKA 2024 - Unleashing Your Visual Creativity to fruition. The triumphs of past MINDAREKA editions undoubtedly fueled the organization of this year's event, making MINDAREKA 2024 a reality.

MINDAREKA 2024 - Unleashing Your Visual Creativity stands as a testament to the dedication of students at the College of Creative Arts, UiTM Kedah Branch, providing them with a platform to showcase their final art projects. Beyond serving as a space for the exploration of fresh, innovative, and entrepreneurial concepts, this exhibition is poised to connect aspiring talents with potential clients and employers.

I extend my sincere gratitude to all participants whose enthusiasm and support have contributed to the success of MINDAREKA 2024 - Unleashing Your Visual Creativity. Their unwavering belief and commitment have truly brought this event to life, marking it as a resounding triumph!

Head of Faculty Message

Mohamat Najib Mat Noor
Head of Faculty
Faculty of Arts & Design
UiTM Kedah Branch

It is an honour to introduce DIAS 2025 – Design Innovation Academic Show, held under the theme "Transcending the Boundaries of Creativity: Innovation in Art & Design for 21st-Century Education." This significant event reflects the faculty's ongoing commitment to fostering a culture of innovation, critical thinking, and creative exploration among our students and academic community. As we navigate the complexities of the 21st century, it becomes increasingly clear that education must go beyond traditional boundaries to embrace multidisciplinary approaches that are both relevant and future-forward.

The three core components of DIAS 2025, Mindareka Design Show, Northern Innovation Academic Tour (NIAT), and the 1st International Virtual Competition of Creative Arts & Innovative Design in Teaching & Learning (InViCCAID)which is serve as vital platforms to highlight the convergence of design, technology, and pedagogy. These initiatives not only empower our students to showcase their talents and ideas, but also create opportunities for engagement with industry leaders, academic peers, and global collaborators. The Mindareka Design Show celebrates student creativity and innovation through compelling final year projects. NIAT fosters knowledge sharing and institutional partnerships through academic visits and exchanges, while InViCCAID offers international recognition for excellence in integrating art and design into teaching and learning.

I would like to express my deepest appreciation to the organising committee, faculty members, students, and strategic partners who have worked tirelessly to bring this programme to life. Your dedication and collaborative spirit have made DIAS 2025 a reality and a reflection of our shared vision for transformative education. It is my hope that this platform will continue to inspire meaningful dialogue, cultivate groundbreaking ideas, and spark a new wave of innovation that enriches both education and society.

Industrial Design (Bachelor)

EZCART | SMART SUPPORTIVE TROLLEY FOR DISABILITIES PEOPLE

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ABSTRACT

EzCart is a thoughtfully designed, multifunctional mobility aid developed to improve the quality of life for individuals experiencing mobility limitations, particularly those with knee pain, leg weakness, or physical disabilities. As the name suggests, "Ez" stands for easy emphasizing the product's core mission of being simple, user-friendly, and accessible for all. "Cart" refers to its trolley functionality, which supports everyday tasks such as shopping or carrying personal items. EzCart combines the features of a walking guide and a trolley, offering users both physical support and practical utility in a single device. The product is ideal for users who face challenges with walking long distances or carrying loads while out in public spaces. By reducing physical strain and supporting balance, EzCart helps prevent falls, encourages mobility, and fosters a greater sense of independence and freedom. Its ergonomic design ensures comfort during use, while its lightweight yet sturdy frame allows it to be both portable and reliable. EzCart is particularly useful for elderly individuals, people in post-surgical recovery, or those with chronic conditions that affect movement. It empowers users to engage routine activities like grocery shopping or outdoor walks without requiring constant assistance. More than just a product, EzCart represents a commitment to inclusive design, enabling individuals with mobility issues to live more active, independent, and dignified lives. By combining practicality with compassion, EzCart redefines how mobility aids can support daily living making routine outings easier, safer, and more enjoyable for everyone who needs a little extra support.

Keywords: Mobility, Accessibility, Independence, Support, Multifunctional

INTRODUCTION

EzCart is a multifunctional product designed to help people with mobility challenges, such as knee pain, leg weakness, or physical disabilities. This project was created as part of an Industrial Design course, focusing on solving real life problems through simple, user-centered solutions. EzCart combines two main functions: it works as a walking aid to support movement and balance, and as a trolley to carry items like groceries or personal belongings. The goal of EzCart is to make daily routines such as shopping or going for a walk easier and more comfortable for people who may struggle with mobility. The design focuses on being easy to use, lightweight, and safe, while also looking modern and practical. It encourages independence and reduces the need for help from others, especially for older adults or people recovering from injury. Throughout the design process, the needs and experiences of users were carefully considered. The project highlights how Industrial Design can improve lives by creating products that are not only functional but also thoughtful and inclusive. EzCart shows how a simple design can have a big impact making daily tasks more accessible and helping users feel more confident and independent in their everyday lives.

MATERIALS AND METHODS

Figure 1.1 The picture of 3D Final Design

The final design of EzCart began with a clear objective: to create a mobility aid that blends practical function with inclusive, user-centered design. At the core of this concept is the idea of ease and support a response to real challenges faced by individuals with mobility issues, such as knee pain or disabilities. EzCart is not just a walking aid or a trolley it's a hybrid solution that provides physical support, independence, and convenience in a single form.

The design draws from modern industrial aesthetics, with a bold yet minimal silhouette defined by sharp lines, geometric cuts, and a functional posture. The angular forms and upright structure reflect a sense of strength and stability, while the warm fabric textures on the outer compartment add a touch of comfort and softness, visually balancing utility and friendliness.

Material contrast plays a significant role in the visual language of EzCart. The solid frame offers support and durability, while the side panels made from a woven like textile reference comfort and approachability. The dual handle design and large, low friction wheels enhance ergonomics and maneuverability, ensuring that the user experiences ease of motion across different surfaces.

EzCart is designed not only to perform but to empower. It embodies thoughtful design where function meets dignity, and where mobility challenges are addressed with style, care, and innovation a product that feels as modern as it is meaningful.

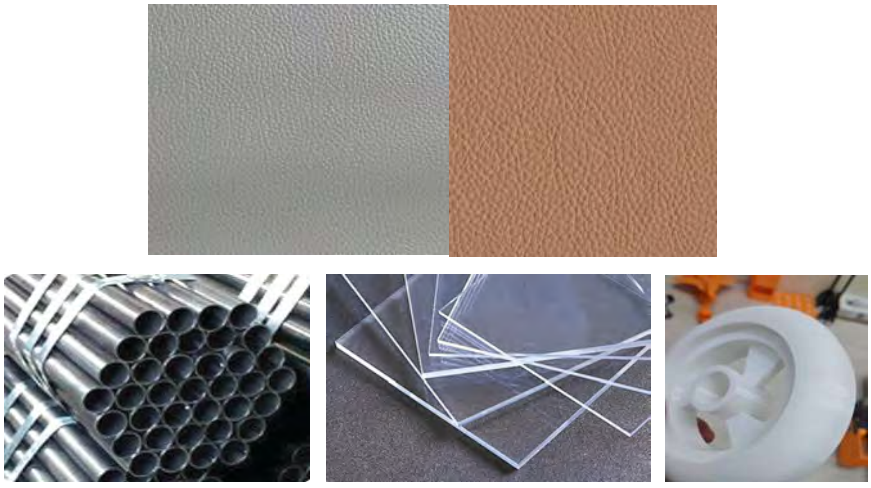


Figure 1.2: The picture of materials

1. Grey Leather (Main Body)

The main body of EzCart is wrapped in grey leather, selected for its durability, smooth texture, and modern look. This material offers a refined surface that is both easy to clean and resistant to wear. The neutral grey tone gives the product a sleek, professional appearance suitable for a wide range of users.

2. Cream Leather (Front & Back Pocket)

The front & back pocket is covered in cream colored leather, chosen to provide a soft contrast to the grey body. This warm, lighter tone enhances the product's approachability while still maintaining a clean and elegant aesthetic. The leather pocket adds a tactile quality and serves as a functional element for storing smaller items.

3. Metal Pipe (Structural Frame)

The internal structure of the trolley is made from metal pipes, ensuring strong support and stability. This material allows the cart to withstand regular use and heavy loads while remaining lightweight enough for comfortable handling. Its robustness is essential for user safety and reliability.

4. Acrylic (Side Pattern Panel)

Red colored acrylic is used on the sides of the trolley, featuring geometric patterns or cut outs. These add a modern design accent while also reducing overall weight. The acrylic brings a visual lightness and makes the design more dynamic without compromising strength.

5. 3D-Printed Material (Wheels/Tires)

The wheels are made using 3D printed materials, offering both customization and precision. This approach allows for ergonomic tread patterns, shock absorption features, and lightweight construction. The ability to customize the tire material also helps ensure better grip and smoother movement across different surfaces.

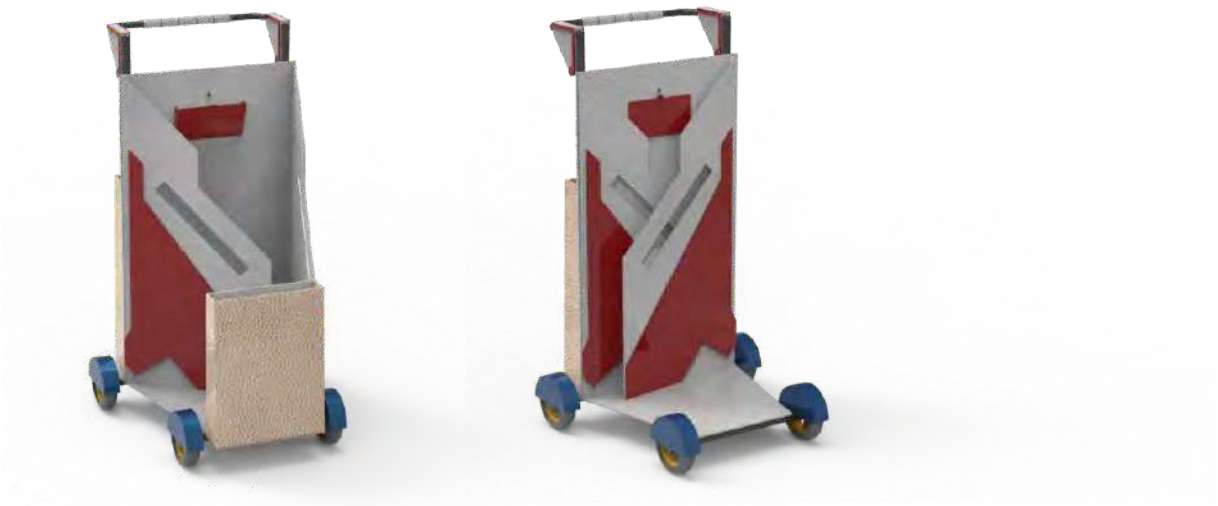


Figure 1.3: The picture of method

The The fabrication of EzCart follows a structured, hands on process that combines lightweight materials with user friendly design. The process begins by shaping the main body using plywood, which serves as the internal frame. Plywood is selected for its strength, light weight, and ease of construction, forming the core structure that defines the overall shape of the trolley. Once the frame is complete, it is covered with PE foam to provide padding and smooth out the edges. This foam layer not only adds comfort but also ensures a clean, contoured surface for the next step.

The entire frame is then wrapped in leather, which gives the trolley its final look and feel. The leather enhances the aesthetic appeal while also making the surface durable and easy to maintain. This step adds a soft yet professional finish, making the trolley feel comfortable and approachable. After the body is fully wrapped, the final construction stage involves building the handle and base of the trolley. These components are typically made from metal pipes and additional structural supports, ensuring balance, strength, and ease of handling. Wheels are attached at the base to provide smooth mobility, completing the assembly of a multifunctional product designed for both support and convenience.

RESULTS AND DISCUSSION/FINDINGS

Through the development of the EzCart project, several key findings emerged that directly influenced the final design and functionality. Initial research highlighted a strong need for a mobility aid that also serves practical purposes, especially among elderly users and individuals with mobility challenges such as knee pain or leg weakness. User feedback revealed that existing solutions often lacked comfort, convenience, or a sense of dignity. As a result, the design of EzCart focused on creating a multifunctional product that could act both as a walking guide and a trolley for carrying personal items during outings. The use of lightweight yet durable materials, such as plywood, PE foam, leather, and metal pipes, contributed to a structure that is both supportive and aesthetically appealing. The combination of ergonomic handles, stable wheels, and soft touch finishes created a user friendly experience. The final prototype successfully met its intended goals offering a product that improves independence, comfort, and mobility for users. Overall, EzCart demonstrates how thoughtful, user centered industrial design can transform everyday challenges into empowering solutions, blending form and function to create a product that is both practical and emotionally supportive.

CONCLUSION & RECOMMENDATION

In conclusion EzCart project successfully demonstrates how industrial design can be used to create inclusive, functional, and user centered solutions. By combining the features of a walking guide and a trolley, EzCart addresses both mobility and practical

daily needs for individuals with disabilities, elderly users, and those suffering from knee or leg pain. The final design reflects a balance of comfort, functionality, and modern aesthetics, achieved through thoughtful material selection and ergonomic form development. Throughout the process, user research, prototyping, and material testing played a key role in ensuring the final product meets real life demands. EzCart not only helps users move with greater independence and confidence but also contributes to their overall quality of life.

For recommendation future development, it is recommended to conduct further user testing with a broader demographic, including caregivers and healthcare professionals, to refine usability and ergonomics. Adding features such as adjustable handle heights, foldable components for easier storage, or optional accessories (e.g., a seat or cup holder) could increase the product's versatility. Exploring sustainable material alternatives and mass manufacturing techniques may also support long term scalability and cost efficiency. With continued improvement, EzCart has strong potential to become a widely used mobility aid that blends compassion with innovation in everyday design.

Figure 1.4: The picture of Environment (EzCart)

REFERENCES

Banu, M. A., & Arunpandian, D. M. (2024). Approximate computing-based assistive shopping trolley for visually challenged people. ResearchGate.

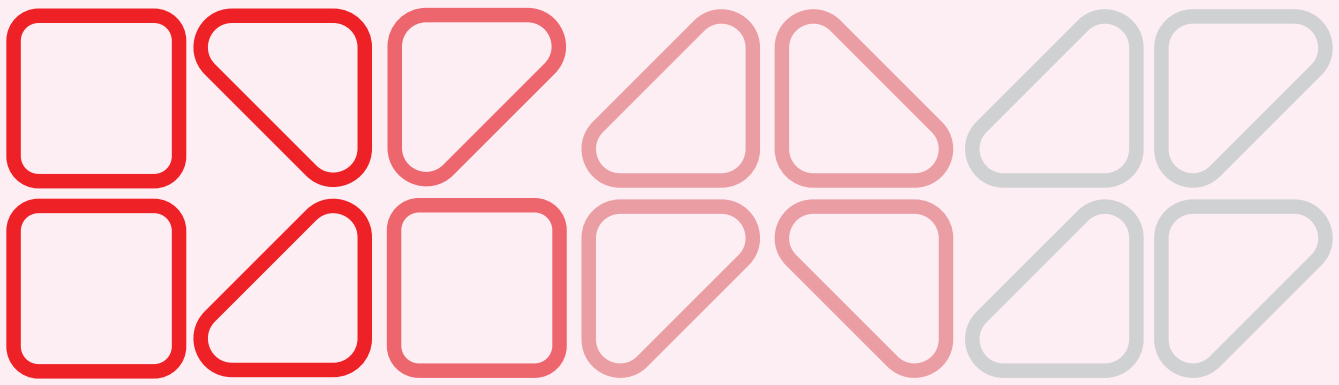
Ferguson, P. M., & Nusbaum, E. (2012). Disability studies: What is it and what difference

does it make?. Research and practice for persons with severe disabilities, 37(2), 70-80.

Leonardi, M., Bickenbach, J., Ustun, T. B., Kostanjsek, N., & Chatterji, S. (2006). The definition of disability: what is in a name?. The Lancet, 368(9543), 1219-1221.

Tuvie. (n.d.). Empathik: Mobility aid for seniors doubles as a shopping trolley. Tuvie: Modern Industrial Design Ideas.

Webber, S. C., Porter, M. M., & Menec, V. H. (2010). Mobility in older adults: A comprehensive framework. The Gerontologist, 50(4), 443–450.



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