

# e - Proceedings



## Proceeding for International Undergraduates Get Together 2024 (IUGeT 2024)

"Undergraduates' Digital Engagement Towards Global Ingenuity"



Co-organiser:

INSPIRED 2024. Office of Research, Industrial Linkages, Community & Alumni (PJIMA), UiTM Perak Branch

Bauchemic (Malaysia) Sdn Bhd

Universitas Sebelas Maret

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### Recreational Utility Hub (RUH): A Modular Timber-Technology Fusion Hub to Support Student Healthy Campus Lifestyles

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#### ABSTRACT

The Recreational Utility Hub (RUH) is a cutting-edge facility designed to foster a healthy lifestyle among students. By integrating recreation and technology, the RUH creates a dynamic space that promotes both physical and mental well-being. Its modular structure allows for customization to meet diverse recreational support needs, ensuring optimal utilization. Equipped with essential amenities such as charging stations, refrigeration, and digital health tools, the RUH supports a wide range of outdoor activities. A key feature is its sustainable design, which incorporates solar power and timber construction to minimize environmental impact. To enhance user engagement, the RUH leverages modern advancements from the Fourth Industrial Revolution (4IR), including sensor technology, energy storage solutions, and augmented reality (AR). Aligned with Self-Determination Theory, the hub incorporates gamification elements to boost intrinsic motivation and encourage sustained participation. Located at UiTM Perak Branch, Seri Iskandar, the RUH exemplifies how innovative design can transform campus spaces into thriving hubs for student health and happiness.

**KEYWORDS:** Healthy lifestyle, intrinsic motivation, modular, technological integration, user experience.

#### **DESIGN DESCRIPTION**

The Recreational Utility Hub (RUH) is a groundbreaking solution designed to address the gaps in campus infrastructure that often hinder students' recreational activities and overall well-being. Campus settings play a crucial role in shaping the experiences and health of students, yet many institutions, particularly those with limited funding, lack the necessary facilities to meet these needs. Research has shown that inadequate recreational infrastructure, coupled with a lack of awareness about the benefits of recreation, leads to lower levels of student engagement in physical activities (Abdullah, N., & Mohammad, N., 2016; Ain et al., 2022). For example, a study revealed that among 317 respondents, 67.2% engaged in moderate-intensity activity, 19.2% in high-intensity activity, and 13.6% in low-intensity activity (Ain et al., 2022). To address these challenges, the RUH is designed to transform underutilized campus green spaces into vibrant and engaging recreational hubs. The RUH leverages the latest advancements in technology and modular architecture to create a flexible and dynamic space. By integrating essential amenities with a modular design, the RUH provides a versatile environment that can be tailored to various recreational activities. The RUH emphasizes user-centered design principles, prioritizing comfort, accessibility, and overall user experience. The modular nature of the RUH allows it to be easily reconfigured, enabling students to personalize their recreational space according to their preferences and needs, which fosters a sense of autonomy.



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Figure 1: Conceptual Framework for Engagement with the Recreational Utility Hub (RUH), Adopted from Self-Determination Theory (Jenn Cusick, 2022)

Furthermore, the RUH aligns with the principles of Self-Determination Theory (SDT), which emphasizes the importance of intrinsic motivation in fostering sustained engagement. The design supports autonomy by allowing users to customize their experience, competence by offering tools for goal-setting and progress tracking, and relatedness by creating communal spaces that encourage social interaction. These elements work together to promote a sense of belonging and community among students, which is essential for sustained participation in recreational activities. The RUH aims to reduce the percentage of those involved in low-intensity activities, thereby improving overall student well-being. By integrating physical activity, social engagement, and technological enhancement, the RUH aspires to become an indispensable part of the campus. It promotes both the educational and personal growth of students by creating an environment that supports a healthy, active, and connected campus community.



Figure 2: Modular Assembly and Structural Components of the Recreational Utility Hub (RUH)



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Figure 3: User Interaction Flowchart within the Recreational Utility Hub (RUH)

#### NOVELTY AND UNIQUENESS



Figure 4: Innovative Module

Typologies in the Recreational Utility Hub (RUH), from left to right: Storage, Fan, Digital Health System, Scoreboard, and Charging Station. The RUH has the ability to adapt to various activities through its modular structure, where different modules can be combined to create distinct spaces. Each module consists of three primary components that can be easily assembled and customized by users based on their creativity. This flexibility empowers users to personalize their recreational environment. It also enhances the recreational experience at the nearby lake by providing students with tools to set goals, track their progress, and stay motivated in their outdoor activities. The hub features amenities such as storage space, charging stations, and a digital health system, making students engage more in recreational pursuits. This approach also nurtures mental wellbeing, helping students maintain a balanced and healthy lifestyle.

#### **BENEFITS TO MANKIND**

The seamless integration of technology and convenience not only supports individual health and mental well-being but also has broader societal implications. By fostering healthier, more focused individuals, the RUH contributes to the development of a more resilient and capable population. The principles embodied in the RUH, promoting outdoor activity, reducing environmental impact through sustainable design, and enhancing user engagement can be applied in various contexts to improve public health and community well-being on a larger scale.

#### **COMMERCIAL POTENTIAL**

The RUH's modular design is scalable and adaptable to various locations, enhancing its appeal in different markets, particularly students and recreational enthusiasts. By integrating essential amenities such as charging stations, digital health systems, and storage within a sustainable



framework, the RUH meets the growing consumer demand for eco-friendly products. By embedding SDT principles into its design, the RUH appeals to the growing market of consumers who prioritize wellness and self-improvement. The use of solar power, timber construction, and cutting-edge technologies like sensors, energy storage, and augmented reality positions the RUH as a forward-thinking solution with broad market appeal.

#### CONCLUSION

In conclusion, the Recreational Utility Hub (RUH) represents a groundbreaking innovation, going beyond a mere hub to become a catalyst for enhancing student life. Its flexible, eco-friendly space seamlessly merges the natural environment with cutting-edge technology, creating a unique and inviting spot where students can relax, recharge, and engage in various activities. The RUH's modular design is a key element of its novelty, offering unparalleled flexibility with easy-to-assemble components that can be configured into diverse spaces to meet different needs. This fusion of timber and technology also fosters a sustainable and vibrant campus environment. Moreover, the RUH's potential extends beyond its immediate benefits to students; it presents significant commercial opportunities. By aligning with contemporary trends in health, sustainability, and technology, the RUH positions itself as a marketable product with broad appeal. Its innovative approach to integrating recreational support with technology-driven features resonates with the growing demand for wellness-focused, eco-friendly solutions.

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