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



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

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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-SS029) POCKET POWER

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ABSTRACT

The world today is now facing the challenge of how to maintain comfort in a warming climate and how to reduce dependence on non-renewable energy sources. Therefore, the purpose of the project to be carried out is to develop a pocket power, a portable device that uses solar energy to provide personal cooling. The innovation of the pocket power idea offers a refreshing alternative, harnessing the power of the sun to provide a cool breeze while traveling or in off-grid situations. Pocket power offers a promising alternative because the product uses solar energy, a clean and accessible resource. By collecting solar energy, it will significantly reduce dependence on the electricity system, especially during periods of high demand. This energy is also one of the energies that preserves the environment without polluting it. In conclusion, the innovation of the idea to create this pocket power design can solve the problems faced well and will be well received.

Keywords: Pocket power, Portable device, Innovation, Objective, Solar energy

1.0 INTRODUCTION

The pocket power project aims to provide a sustainable and portable cooling solution for individuals without access to a power grid. By harnessing the sun's power, it addresses the market gap for portable and sustainable cooling options. Traditional battery-powered fans have limited runtime and contribute to electronic waste, leading to higher energy consumption and greenhouse gas emissions (El-Sebaili, 2012). Pocket power uses clean, readily available solar energy, reducing reliance on electrical grids during high demand periods (Brown, 2023). The project aims to create a user-friendly, efficient device that caters to the increasing demand for environmentally friendly cooling alternatives, making it beneficial for outdoor activities, travellers, and those facing power outages.

2.0 OBJECTIVE

To develop and observe a pocket power, a portable device that uses solar energy to provide personal cooling (Smith, 2023). The project objective is focused on creating a sustainable, efficient, and user-friendly solution. In addition, several other objectives can be highlighted to create this pocket power including:

- i. To demonstrate the effectiveness of pocket powers in providing personal cooling.

- ii. To evaluate solar energy conversion efficiency and battery life when using additional solar charging.
- iii. To promote the practical application of pocket powers and explore how this sustainable and portable cooling solution will benefit people.
- iv. To design and build a working pocket power. The design will prioritize portability, ensuring the fan is easy to transport and has longer ventilation.

3.0 METHODOLOGY

A pocket power is a portable and sustainable cooling device that harnesses the sun's power to provide a refreshing breeze without the need for batteries or electrical outlets. This small, compact device is lightweight, easy to carry, and ideal for outdoor activities like camping, hiking, or picnics (Johnson, 2022). It operates silently, allowing users to enjoy its cooling effects without disturbance.

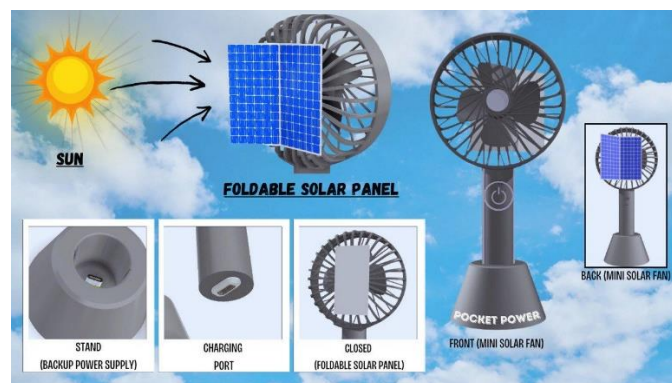


Figure 1: Design idea for this Pocket Power.

Additionally, pocket powers offer a sustainable and portable solution for staying cool. These compact devices can be a trusty companion for individuals lounging at the beach, sitting in parks, or simply relaxing at home, ensuring comfort and a refreshing breeze (Hospers, 2020). Additionally, pocket powers promote cost-effectiveness by eliminating the need for battery purchases or reliance on electricity. This translates to not only financial savings but also a reduced carbon footprint (Parsons, 2023). Furthermore, pocket powers boast user-friendly operation. Simply positioning the device in direct sunlight allows the solar panels to convert sunlight into energy, powering the fan (Siecker, 2017). As a result, users can enjoy a cool breeze without incurring additional costs or environmental burdens (Li, 2013). In conclusion, the pocket power is a practical and sustainable cooling solution that can be used in various settings, from outdoor adventures to everyday use. It is an eco-friendly and cost-effective solution that eliminates the need for batteries or electricity, allowing individuals to enjoy a cool breeze without contributing to pollution or relying on traditional energy sources.

4.0 RESULTS

The purpose of this survey was to assess the interest of students and lecturers at UiTM Cawangan Terengganu, Campus Dungun in discussing the idea of implementing mini solar fans to address power supply issues. The survey consisted of 10 questions

covering various aspects of decision to purchase, environmental sustainability, features and prices. We got 76 respondents and 70 from them are students and 6 lecturer. Next, this survey aimed to gauge interest levels and identify potential benefits of such an initiative. Interestingly, 44.6% of respondents were aware of the concept of solar-powered mini handy fans before participating in the survey, suggesting a potential gap in knowledge or market awareness. Among the factors influencing the decision to purchase a mini handy fan with solar power integration, effectiveness in cooling (60.5%) and environmental sustainability (59.2%) emerged as the most significant considerations.

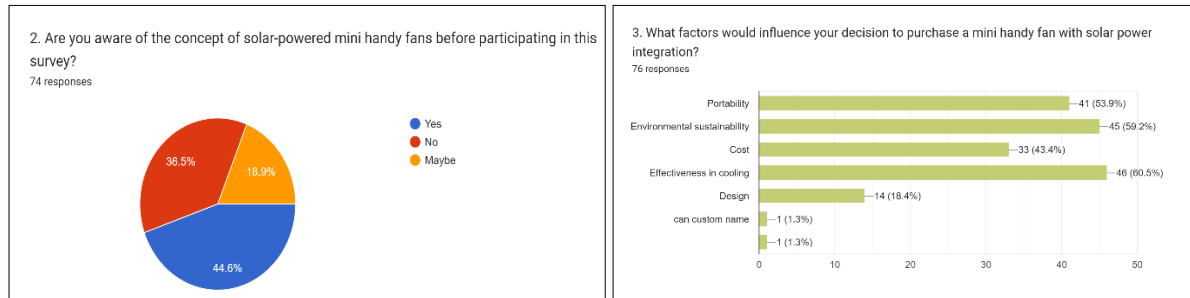


Figure 2&3: Data survey on students and lecturers' behaviour toward this pocket power and their influencing decision to purchase this product.

Additionally, this survey found that the most essential features in portable cooling devices like mini handy fans were size and weight (69.7%), cooling effectiveness (65.8%), and power source (e.g., solar, battery) (60.5%). Results also indicated that 79% of respondents were moderately to extremely concerned about the environmental impact of disposable batteries used in traditional portable fans, underscoring a growing awareness of sustainability issues.

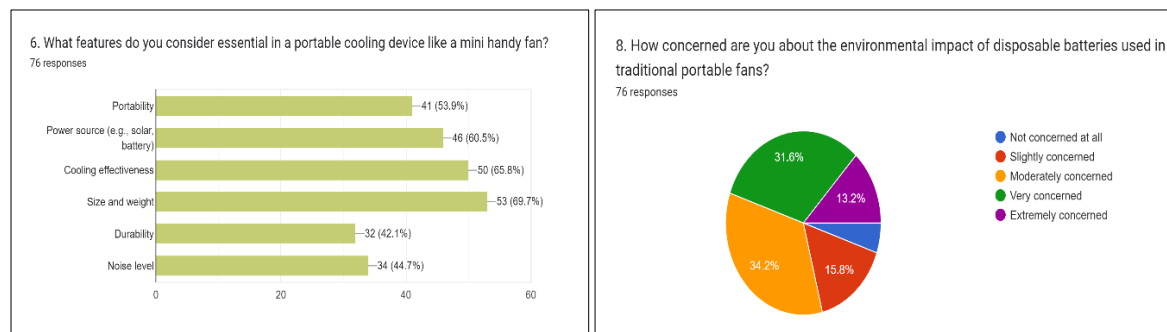


Figure 4&5: Survey on features of this pocket power and environmental impact of disposable battery.

These summary results provide insights into consumer attitudes, preferences, and behaviors related to solar-powered mini handy fans, offering valuable information for market analysis and product development strategies. Handheld solar-powered fans are portable, environmentally friendly, and offer energy efficiency, mobility, and less impact on the environment (Johnson, 2022). However, they rely on sunlight, have low power output, and may have durability issues. Solutions include improving durability, increasing battery capacity, and increasing solar panel efficiency. These fans are ideal

for outdoor use and disaster preparedness, and with further innovation, they could become more popular and efficient cooling options (Hematian, 2011).

5.0 CONCLUSION

The pocket power with solar power is a revolutionary personal cooling device that uses solar energy to provide a sustainable, cost-effective, and versatile cooling solution. This innovative device reduces reliance on traditional energy sources and enhances portability, making it ideal for outdoor activities, travel, and emergencies. It sets a new standard for eco-friendly personal appliances, inspiring awareness and action towards a greener future. The pocket power with solar power is a practical, forward-thinking solution for staying cool while minimizing environmental impact (Chen, 2024).

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