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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-SS021) TEMPERATURE CONTROL STRAW

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ABSTRACT

ThermoSip is a temperature-regulating straw that was developed in response to issues with maintaining beverage temperature and environmental sustainability related to conventional plastic straw use. ThermoSip uses cutting-edge technology—a rechargeable battery and integrated micro-controller—to regulate drink temperature while reducing waste. In comparison to traditional straws, this study emphasizes the practicality, environmental clarity, and ease of use of ThermoSip. Temperature-regulating straws are necessary since research indicates that people enjoy their drinks at the right temperature, particularly in hot weather. ThermoSip provides a way to keep beverages at the right temperature while on the go through the combination of cutting-edge materials and technology, improving customer satisfaction and encouraging the use of reusable alternatives.

Keywords: environmental, plastic, technology, temperature control straw, weather

1.0 INTRODUCTION

Drinking straws, made from various materials like plastic, paper, metal, or bamboo, are designed for easy sipping without tilting the container. Concerns about their environmental impact arise because people are often used once and contribute to plastic pollution (FloWater, 2020). To address this, a temperature-controlling straw called ThermoSip was invented. It can adjust water temperature as desired, offering cold, hot, and warm options. Made from stainless steel, it comes with a charging case containing a power-storing button and cable. When the straw is placed inside, it connects to the case battery, transferring power.

This is because several problems are occurring in our environment. Firstly, it's difficult to maintain the temperature of water. Since the water is inside a bottle, it cannot retain the temperature that people desire. Secondly, the unpredictable weather. The environment is very hot, so people can control the water temperature inside the bottle. Next, electricity usage. These straws have a case that conducts electricity to the straw, maintaining electrical energy for a long time. So, it does not use much electricity.

As students, they face issues with the weather and the campus environment not being suitable for some students. In the current situation, the weather is very hot, and the students often need cool water to refresh themselves. Additionally, the campus environment, which is a bit far from the dormitories, requires some students to walk, leading them to need water at a cool temperature.

2.0 OBJECTIVE

1. To provide convenience, the ThermoSip offers a compact size that saves space and can easily fit inside a bag. Additionally, its casing ensures it is not easily lost.
2. To promote environmental friendliness, this product abstains from using plastic, thus significantly reducing its ecological footprint. By utilizing stainless steel material, it minimizes waste and contributes to sustainability efforts.

3.0 METHODOLOGY

ThermoSip, a temperature control straw, features a built-in microcontroller within its central portion, serving as a temperature sensor and regulating the heating and cooling elements accordingly. Additionally, it is rechargeable and includes a charger case that doubles as a power bank for the straw. When placed inside the case, the straws connect to internal charging pins, enabling the case battery to charge the straw's battery. ThermoSip is particularly beneficial for beverages sensitive to temperature changes, such as hot coffee or tea, or cold drinks like iced coffee or smoothies, as it maintains the beverage at the desired temperature throughout consumption. Designed for everyday practicality, ThermoSip comes with a case, facilitating portability for users to take it wherever they go.

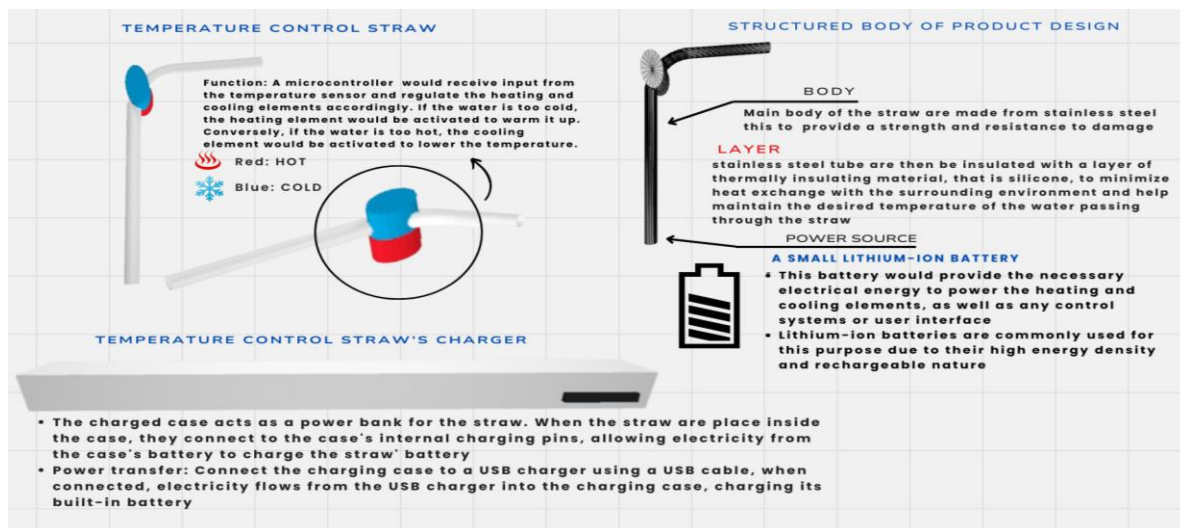


Figure 1: Temperature control straw detailing for each component

4.0 RESULT

Research reveals that temperature-control straws are still never used, prompting humanity to improve on existing straws (plastic straws). ThermoSip allows customers to enjoy their drinks while saving money in the long run, resulting in enjoyment, convenience, and satisfaction. Meanwhile, ThermoSip aids in waste reduction as compared to single-use plastic straws because it is environmentally sensitive and will feel more responsible. Furthermore, folks will prefer cold water to hot water, particularly during the summer. As a result, temperature control straws can be used at two different water temperatures because ThermoSip combines innovative technologies including vacuum insulation, phase change materials, and electrical heating elements to accomplish temperature control but not with regular straws, which do not have these capabilities. Overall, this straw innovation can enhance the user experience and promote the usage of reusable alternatives.

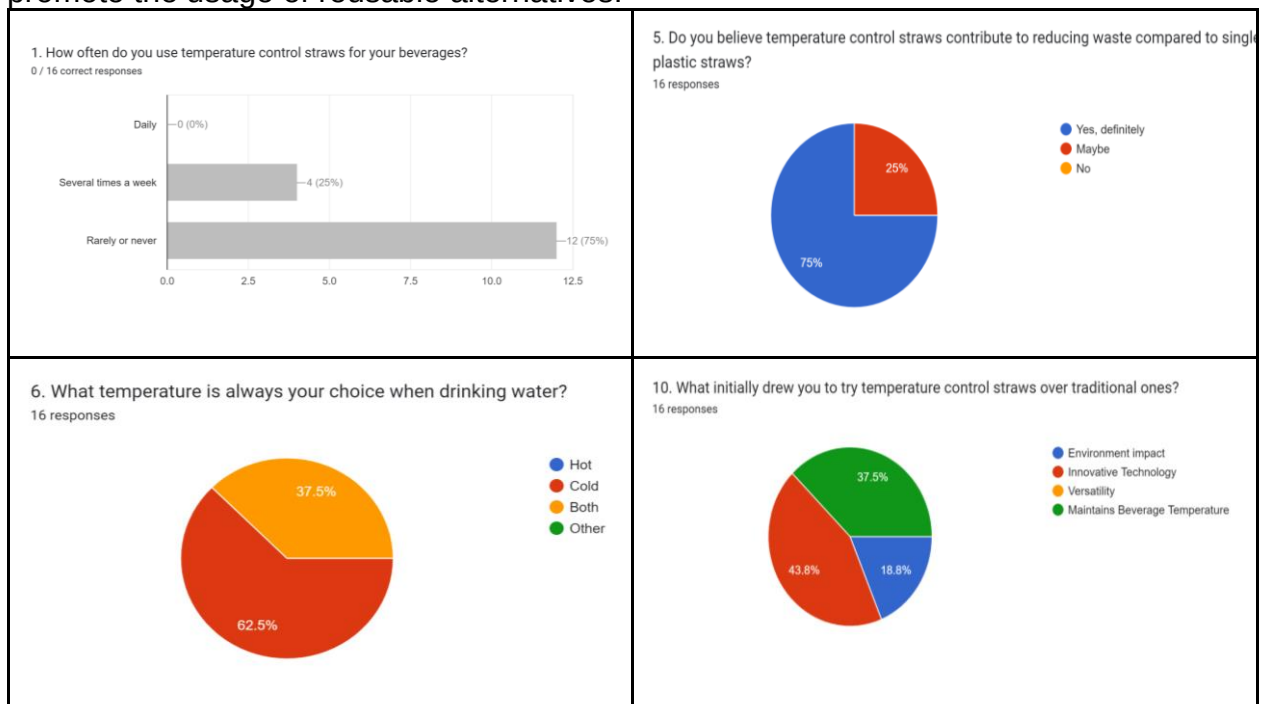


Figure 2: Survey on the improvements that can be made to existing straws and opinions on the creation of a new straw called "ThermoSip"

5.0 CONCLUSION

ThermoSip, a temperature- controlling straw, emphasizes its innovative features and potential benefits. It highlights the practicality and necessity of temperature-regulating straws, particularly in hot weather, as people enjoy their drinks at the right temperature. ThermoSip is designed to keep beverages at the desired temperature on the go, thereby enhancing customer satisfaction and promoting the use of reusable alternatives. The conclusion also emphasizes the environmental friendliness of ThermoSip, as it aids in waste reduction and contributes to sustainability efforts.

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