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UNIVERSITI  
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MARA



2023

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**JOHOR  
INNOVATION  
INVENTION  
COMPETITION  
AND  
SYMPOSIUM  
2023**



" Innovation Inspires a Society  
to be Critical and Creative"

# **JOHOR INNOVATION INVENTION COMPETITION AND SYMPOSIUM 2023**



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"Innovation Inspires a Society to be  
Critical and Creative"

**Editors-in-Chief**

**AHMAD KHUDZAIRI KHALID  
NUR INTAN SYAFINAZ AHMAD**



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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 Innovation Invention Competition and Symposium 2023 (JIICaS2023), where JIICaS2023 is a virtual platform for all creative minds to share and present their invention and innovation. The extended abstracts are divided into two categories, which are Category A (Higher Educational Student/ Any Recognized Institutional Students in Malaysia) and Category B (Primary/ Secondary School Students / Special Education School Students in Johor). 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 from both categories and get some ideas to develop future innovation products.**



### **iV-STEM KIT: STEM MAGIC BALLOON**

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### **ABSTRACT**

iV-STEM KIT: STEM MAGIC BALLOON is a high-impact product that was innovated to be used as a tool and teaching aid in the STEM field. This special product was created by a group of researchers from STEM volunteerism known as iV-STEM@VOLUNTEERS STEM because it was found that many primary school students are not interested in STEM-based subjects. Currently, the enrollment of students entering the Science stream has also not reached 60 percent. The iV-STEM KIT product that was created coincides with the current situation because this product can attract students' interest in subjects related to the STEM field. Not only that, this STEM KIT can make it easier for the school to prepare materials and carry out 'Hands-on Experience' activities with the students. This iV-STEM KIT product is produced using materials that are easily available around at a low cost. Parents can also save and only need to buy one unit of this iV-STEM KIT for one price without buying at a high cost for some necessary materials. This iV-STEM KIT has used a digitization method in the operation of using this STEM Kit. Bar codes have been provided to facilitate users to carry out this magic balloon activity. The users just need to scan the barcode and they will be able to see the video recording that has been prepared by the researchers on the official iV-STEM YouTube. This iV-STEM KIT is an innovative and creative teaching aid to increase the level of understanding of students in the STEM field because it is cheap and easy to do anywhere. This product has been commercialized to schools, parents and the public as a teaching aid for Science subjects in the STEM field.

**Keywords:** iV-STEM KIT, iV-STEM@VOLUNTEERS STEM, Hands- on Experience, teaching aids, STEM field.

### **1.0 INTRODUCTION**

According to Kementerian Pendidikan Malaysia, numbers of students enrolling in Science, Technology, Engineering and Mathematics (STEM) decreases over time. The lack of exposure toward STEM subjects are known to be the main issue. Thus, a team of volunteers is needed to overcome this problem which uses descriptive statistical methods to evaluate the responds. The program that is run and STEM Kit that is produced has shown a positive impact and feedback in increasing the percentage enrolment in STEM subjects.

## 2.0 OBJECTIVE

STEM MAGIC BALLOON is a high-impact product that was innovated to be used as a tool and teaching aid in the STEM field. Besides, this product can attract students' interest in subjects related to the STEM field. Not only that, this STEM KIT can make it easier for the school to prepare materials and carry out 'Hands-on Experience' activities with the students.

## 3.0 DESCRIPTION OF INNOVATION/METHODOLOGY

Students are given a synopsis of a prototype, an example of implemented activities by Volunteers STEM members as an initial guide. Observation skills and problem-solving skills good for each participant is required in completing each task by following the video provided on the Volunteers STEM YouTube channel. "Magic Balloon" is a high-impact product that is innovated to be used as a tool and teaching aids in the field of STEM. This Volunteers STEM Kit is produced using materials that are readily available around at a low cost. This is also one of an innovative and creative solution to increase the understanding of student in the field of STEM.

## 4.0 ADVANTAGE/IMPACT/RESULTS/NOVELTY

All activities conducted online by the Volunteers STEM group with full use of the Volunteers STEM capsule module and Kit contributed to over 70% of the study findings from study respondents. The performance and feedbacks are shown in Figure 1.

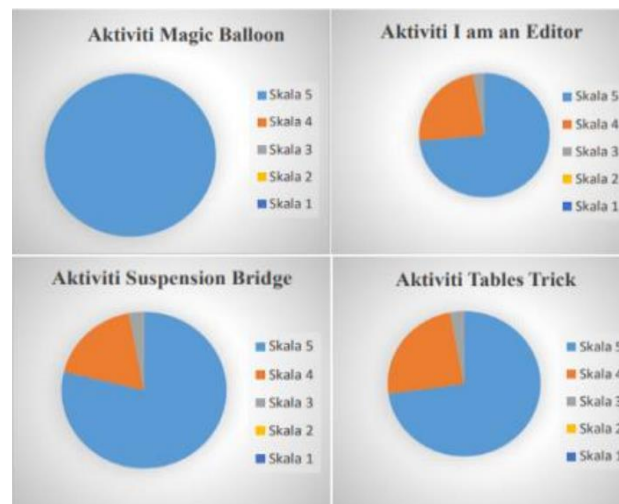


Figure 1: Performance and Feedbacks

Data analysis involves the process of cleaning data. Missing or incomplete data excluded in this analysis to avoid influencing the results as a whole. Thus, only 43 questionnaire forms out of 60 respondents analysed.

## 5.0 CONCLUSION

STEM is here to stay. Fun and playful, yet thoughtfully designed science experiment kits from Volunteers STEM members can help all of us teach the next generation about the incredible world and universe they live in. Most of the kids loved to play this kit, and it was a great hands-on way to learn.