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“Optimizing Innovation in Knowledge, Education and Design”

EXTENDED ABSTRACT



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Azni Syafena Andin Salamet
Nurfaznim Shuib

Cover design : Syahrini Shawalludin
Layout : Syahrini Shawalludin

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Assalamualaikum warahmatullahi wabarakatuh,



First and foremost, I would like to express my gratitude to the organizing committee of i-Spike 2023 for their tremendous efforts in bringing this online competition a reality. I must extend my congratulations to the committee for successfully delivering on their promise to make i-Spike 2023 a meaningful event for academics worldwide.

The theme for this event, 'Optimizing Innovation in Knowledge, Education, and Design,' is both timely and highly relevant in today's world, especially at the tertiary level. Innovation plays a central role in our daily lives, offering new solutions for products, processes, and services. By adopting a strategic approach to 'Optimizing Innovation in Knowledge, Education, and Design,' we have the potential to enhance support for learners and educators, while also expanding opportunities for learner engagement, interactivity, and access to education.

I am awed by the magnitude and multitude of participants in this competition. I am also confident that all the innovations presented have provided valuable insights into the significance of innovative and advanced teaching materials in promoting sustainable development for the betterment of teaching and learning. Hopefully, this will mark the beginning of a long series of i-Spike events in the future.

It is also my hope that you find i-Spike 2023 to be an excellent platform for learning, sharing, and collaboration. Once again, I want to thank all the committee members of i-Spike 2023 for their hard work in making this event a reality. I would also like to extend my congratulations to all the winners, and I hope that each of you will successfully achieve your intended goals through your participation in this competition.

Professor Dr. Roshima Haji Said
RECTOR
UiTM KEDAH BRANCH



WELCOME MESSAGE (i-SPIKE 2023 CHAIR)



We are looking forward to welcoming you to the 3rd International Exhibition & Symposium on Productivity, Innovation, Knowledge, and Education 2023 (i-SPIKE 2023). Your presence here is a clear, crystal-clear testimony to the importance you place on the research and innovation arena. The theme of this year's Innovation is "*Optimizing Innovation in Knowledge, Education, & Design*". We believe that the presentations by the distinguished innovators will contribute immensely to a deeper understanding of the current issues in relation to the theme.

i-SPIKE 2023 offers a platform for nurturing the next generation of innovators and fostering cutting-edge innovations at the crossroads of collaboration, creativity, and enthusiasm. We enthusiastically welcome junior and young inventors from schools and universities, as well as local and foreign academicians and industry professionals, to showcase their innovative products and engage in knowledge sharing. All submissions have been rigorously evaluated by expert juries comprising professionals from both industry and academia.

On behalf of the conference organisers, I would like to extend our sincere thanks for your participation, and we hope you enjoy the event. A special note of appreciation goes out to all the committee members of i-SPIKE 2023; your dedication and hard work are greatly appreciated.

Dr. Junaida Ismail

Chair

3rd International Exhibition & Symposium Productivity, Innovation, Knowledge, and Education 2023 (i-SPIKE 2023)

PROSCIENCE WORKSHOP

Diana Indim
Faculty of Applied Science,
Universiti Teknologi MARA Sabah Branch, Kota Kinabalu Campus
diana908@uitm.edu.my

Siti Sarayati Hj Abdul Mawah
Faculty of Applied Science,
Universiti Teknologi MARA Sabah Branch, Kota Kinabalu Campus
sarayati@uitm.edu.my

Shirley Arvilla Andrew
Faculty of Applied Science,
Universiti Teknologi MARA Sabah Branch, Kota Kinabalu Campus
shir1903@uitm.edu.my

Farnidah Jasnie
Faculty of Applied Science,
Universiti Teknologi MARA Sabah Branch, Kota Kinabalu Campus
farni224@uitm.edu.my

ABSTRACT

The current requirements for the admission of the Diploma in Science student of Faculty of Applied Science, Universiti Teknologi MARA have been revised to open the opportunities to the students without a background in Physics, Chemistry and Biology to enroll. This leads to the difficulties for the students to comprehend these three core subjects. Therefore, ProScience Workshop was introduced to help the students in their learning process. An online survey was distributed to 37 students who participated in the workshop. However, only 25 students responded to the survey. Approximately 68% respondents were female and 32% were male. Most of the respondents came from National High School (Daily). Overall, the respondents attained a good grade which range from grade A to B with percentages of 70% in physics, 56% in chemistry, and 67% in biology. Respondents show high confidence levels after attending this workshop and perceive the workshop as effective. In conclusion, this workshop is effective to enhance students' understanding in the core subjects.

Keywords: no science background, core subjects, learning process, enhance, confidence level

INTRODUCTION

The education system in Malaysia has undergone a transformation through the Malaysian Education Development Plan 2013 - 2025 (PPPM) to prepare students for global competition in the 21st century era (Ilhavenil Narinasamy et al., 2020). One of the changes that have been implemented is the launch of the Secondary School Standard Curriculum (KSSM) in 2017 with the abolishment of Science and Literature streams to the upper secondary level students (Lah, F. C., 2019). Instead, the students need to choose a Subject Package that includes three subject groups namely Core Subjects, Compulsory Subjects and Elective Subjects started with the

student who sat for SPM in 2021 (Kementerian Pendidikan Malaysia, 2016). The purpose of introducing the subject package is to allow students the chance to identify and select subjects according to their preferences, interests, and aptitudes. Students can therefore choose a combination of subjects from the optional packages. Since students have a wide choice in the subject's selection, there is a chance that they will select fewer challenging courses and avoid taking more tough subjects such as Additional Mathematics, Physics, Chemistry, and Biology. However, these subjects are fundamental to most science and technology-based courses at the higher education level.

Parallel to the change, the requirements for student admission to UiTM have been revised to reflect the change in the subjects that the upper secondary school students choose to study. This includes the admission criteria for the Diploma in Science program, where students are only required to earn a credit in one of the elective subjects from the optional subject package rather than two credits and a pass in Physics, Chemistry, and Biology. As a result, 139 new students accepted the offer to enroll in the Diploma in Science at the UiTM Sabah Branch during the admission of Academic Session 1 2022/2023 (intake September 2022), and of them, 37 students (26.6%) had no background in physics, chemistry, or biology. Without foundations in those subjects, students perhaps may find it difficult to survive in the program. Therefore, the science enhancement workshop (ProScience Workshop) was developed to help students with limited or no prior background in those subjects to be able to successfully learn the subjects as in Diploma in Science, Chemistry, Physics and Biology are the core subjects and compulsory to be taken in 5 semesters of the study duration. The strategy used by this program to achieve its objectives was through immersive and engaging learning experience through small-group discussion with mentors in an approachable manner. The mentors were chosen among senior students with good academic results to mentor, to guide, and to motivate the students through small group discussions based on questions prepared by the course instructors on selected topics from their syllabus. This workshop is more to early intervention program in order to increase the understanding of the students' participated in the workshop on the core subjects. Intervention is a program to improve the understanding in the task given, weak performance and lack of knowledge (Ishak, M. Z., & Bakar, N. A., 2019).

Therefore, this study was conducted to measure the effectiveness of conducting the program and assess whether such a program had effectively ignited students' interest in science and improved their understanding of scientific principles. The effectiveness of the program is evaluated from the academic performance of the students.

PROBLEM STATEMENT

Due to the change in the admission requirements for the Diploma in Science program, some of the students have no background in the core subjects. Prior to the minimal knowledge on the subject matter, it is difficult for them to follow the learning process. Therefore, this workshop was conducted to assist students to enhance their understanding on the core subjects and obtain good academic results.

OBJECTIVES

This study was conducted to measure the effectiveness of the workshop from the academic performance of the students.

METHODOLOGY

Research Design and Instruments

The study was carried out on semester 1 students Diploma in Science, Academic Session 1 2022/2023 UiTM Sabah Branch without science foundation. It focused on three core subjects; chemistry, physics and biology. The workshop was conducted four times in the semester and handled by selected senior students as mentors. The sample constituted 37 participants, and only 25 responded to the questionnaire.

The survey was conducted using an online Google Form, which consisted of three primary sections: personal details, academic achievements, and overall perception of the workshop. Certain sections encompassed open-ended queries that allowed participants to provide their insights regarding the workshop. The data collected was subsequently analyzed in terms of percentages.

RESULT AND DISCUSSION

Personal details

Among the 25 respondents, 68% were female, while the remaining 32% were male. Approximately 88% of the students were from National High School (Daily), with the remaining 12% from boarding schools.

Academic achievements

Table 1. Students' result.

Subject	Result (Grade)							
	Excellent		Good		Average		Weak	
	A	A-	B+	B	B-	C+	C	FAIL
Physics	5	5	4	5	4	2	0	0
Chemistry	0	0	9	6	2	3	4	1
Biology	2	3	3	10	1	3	2	1

Table 1 shows the result of the core subject of the respondent. Overall, the respondents are able to obtain a good grade with ranges of grades from A to B with percentages of 70% in physics, 56% in chemistry, and 67% in biology.

Overall perception of the workshop

Table 2. Students' confidence level after attending the workshop.

Subject	Confidence level				
	No Confidence	Little Confidence	Some Confidence	Confidence	High Confidence
Physics	0	1	4	14	6
Chemistry	0	1	9	10	5
Biology	0	2	6	11	6

In general, the respondents demonstrated an elevated level of confidence in comprehending the core subjects subsequent to their participation in this workshop. About 80% of the respondents had high confidence in learning physics, 75% in chemistry and 68% in biology.

Table 3. Students' perception on overall effectiveness of the workshop.

Percentage (%)	Level of Effectiveness				
	Very Ineffective	Ineffective	Neutral	Effective	Very Effective
	0	0	36	12	52

On the whole, 12% of the respondents perceived the workshop as very effective, 52% as effective and 36% as neutral. Most of the respondents agreed this workshop should be continued as it is effective in improving students' understanding in these three core subjects.

CONCLUSION

Overall, the outcomes of the workshop lead to the conclusion that the workshop was helpful to the students to better understand Chemistry, Physics, and Biology; the three core subjects for the Diploma in Science. Most of the students attained good grades for the core subjects with elevated level of confidence in comprehending the core subjects after their participation in the workshop. Therefore, this workshop is effective to enhance students' understanding in the core subjects.

COMMERCIALIZATION POTENTIAL

Programs designed to improve students' academic performance have tremendous commercialization potential as students, parents and educational institutions see a need for academic progress. A well-executed program with positive participant feedback and consistent, measurable academic performance improvements has the potential to be used by various academic programs and educational institutions. Therefore, collaboration with educational institutions, teachers, or educational influencers may be possible.

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