i-SPiKE 2023

INTERNATIONAL EXHIBITION & SYMPOSIUM ON PRODUCTIVITY, INNOVATION, KNOWLEDGE & EDUCATION

"Optimizing Innovation in Knowledge, Education and Design"

EXTENDED ABSTRACT

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CATEGORY: AST ACADEMIC INVENTOR

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
3rdInternational Exhibition & Symposium Productivity, Innovation, Knowledge, and Education 2023 (i-SPiKE 2023)

PROGRAM OUTCOMES MONITORING SYSTEM FOR CIVIL ENGINEERING STUDENTS (POSCES)

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ABSTRACT
POSCES (Program Outcomes Monitoring System for Civil Engineering Students) is a web-based system that is developed to ease the program outcomes attainment management for the degreeprogram in the Civil Engineering Studies, UiTM Cawangan Pulau Pinang. There are 12 Program Outcomes that are considered in the development of the engineering curriculum, and it is used to strategize the teaching and learning methods throughout the study years. Therefore, the monitoring of these 12 programme outcomes attainment requires an effective system to store, calculate and systematically manage the students' performance individually as well as according to the student's intake. Proper data management of the program outcomes are essential to ensure the continual quality improvement (CQI) is implemented throughout the engineering programme. This POSCES system directly engaged the OBE committee of the centre of study, lecturer teaching each course, theacademic advisors, and the students themselves as the primary stakeholder. By using the web-based environment, POSCES is accessible anytime and anywhere, through laptops, tabs, or handphones comfortably by all parties involved. POSCES is considered as a kickstart for the Program Outcome systematic management system that can be applied in various engineering programme across the engineering faculties as well as across higher learning institutions. It is a data management systemthat can be seen as a compulsory for the engineering courses in fulfilling the requirements of the Engineering Accreditation Council (EAC) Engineering Technology Accreditation Council (ETAC).

Keywords: program outcomes, civil engineering, education, management

INTRODUCTION

The Outcome Based Education (OBE) focuses on the student's attainment of the program outcomes throughout their study years. The curriculum of the engineering program is tailored based on the program outcomes stipulated in the Engineering Programme Accreditation Standard 2020 (EAC) and Engineering Technician Education Programme Accreditation Standard 2020 (ETAC) that defines the criteria that engineering students are expected to know and able to execute by the time of their graduation. The outcomes are in relation to the skills, knowledge, and behaviour that an engineering student should acquire before they enter the real engineering world. At present, there are twelve (12) PO's that is to be measured in both the Diploma in Civil Engineering (CEEC110) and Bachelor of Engineering (Hons) Civil (Infrastructure) (CEEC221) in UiTM Cawangan Pulau Pinang.

The development of POSCES is in-line with the OBE concept that encompass four major components, which are the i) curriculum design; ii) teaching and learning methods; iii) assessment and iv) continual quality improvement (CQI) and monitoring. This could help in improving the communication, shared expectations of the lecturers and the students as well the program coherence ("Program Learning Outcomes & Program Objectives," n.d.).

The 12 Program Outcomes are considered in the development of the curriculum, and it is used to strategize the teaching and learning methods throughout the study years. These POs are measured through the designed assessments in each course. Hence, the monitoring of these 12 programme outcomes attainment requires an effective management system to store, calculate and manage the students' performance individually as well as according to the student's intake. Proper storage and monitoring of the program outcomes are important to ensure continual quality improvement (CQI) is implemented throughout the education programme. A systematic system is a must for a sustainable quality assurance and improvement process for the engineering program (Kulkarni & Barot, 2019). This monitoringalso allows the centre of study to identify any gaps between the programs designed and the achieved results by the students (Malone, Mark, & Narayan, 2014).

POSCES (Program Outcomes Monitoring System for Civil Engineering Students) is a web-based system that is developed to ease the program outcomes attainment management for the degree program in Civil Engineering Studies, UiTM Cawangan Pulau Pinang. This POSCES system engaged the OBE committee, lecturer teaching each course, academic advisors, and students themselves. Hence, all PO attainment can be stored, monitored, and systematically organized by the centre of studies. By using the web-based environment, POSCES is accessible anytime and anywhere, through laptops, tabs, or handphones comfortably by all parties involved.

Additionally, POSCES also permits a two-way communication between the centre of study and the students as the primary stakeholder of the higher education system. Their feedbacks and reflections on their PO attainments are also collected via POSCES through MyReflections tab. These feedbacks are collected by the centre of study, and it can be viewed and commented by the Academic Advisors of each respective students through the web. The Academic Advisors can also set meetings with their advisees to further discuss on their academic matters and PO attainment. This process is an important aspect to nurture the students understanding on the PO attributes that is measured in their assessments from Year 1(Mat Isa, Mohammad, Saad, & Preece, 2021) and also to get a better insight from their point of view.

Collecting reflections and feedbacks from the students is one of the most important things in the CQI process. This simple and user-friendly medium allows students to view and assess their PO attainments and provide constructional input from their point of view for theimprovement of the courses offered as well as the programme, as a whole. Figure 1 shows theoverview of the POSCES system implemented in the centre of study.

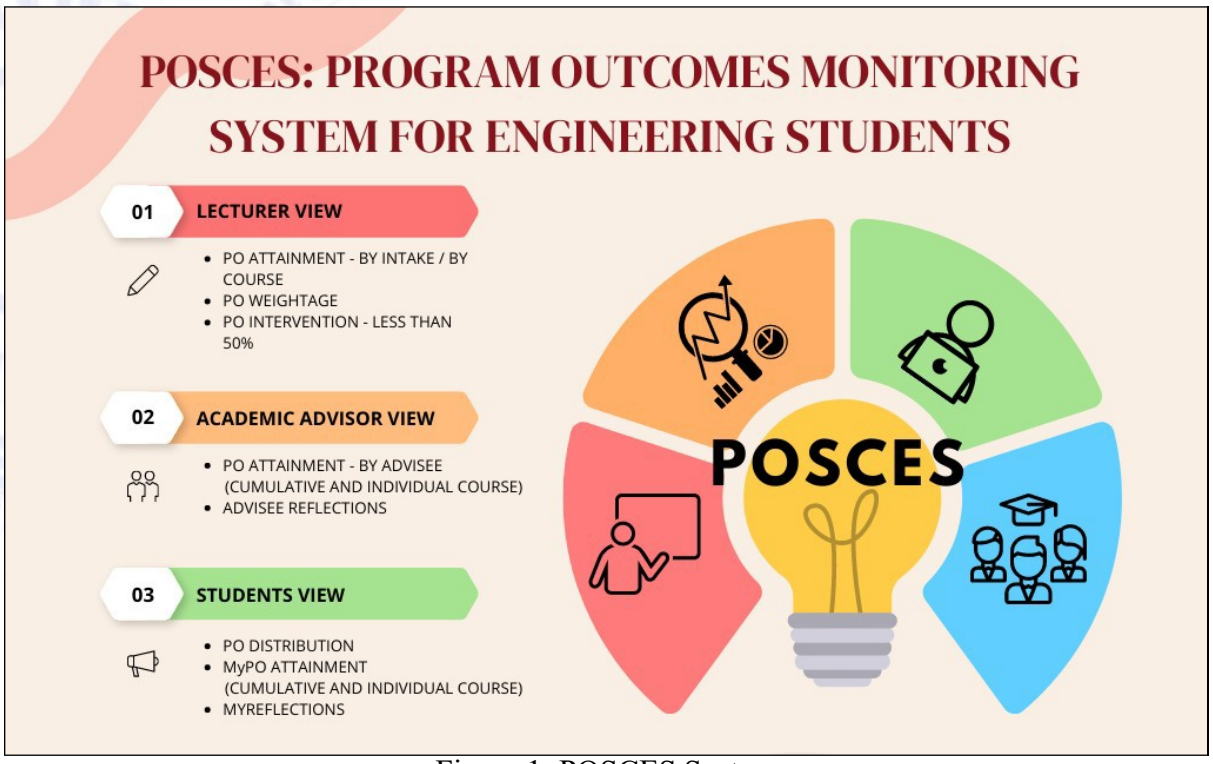

Figure 1: POSCES System

NOVELTY AND UNIQUENESS

POSCES is a paperless and effective integrated system that allows a systematic analysis of the Program Outcome attainment for engineering institutions. It is a system that not only involve the centre of study but also engage the students which are the primary stakeholder of higher learning institutions. POSCES is a web-based system that is accessible anytime and anywhere from the comfort of all parties involved.

This POSCES system is beneficial for:

a) Engineering centre of study (OBE Committee) - To analyse the PO attainment of each student individually and by intake fulfilling the monitoring concept of the Outcome Based Education.
b) Lecturers - allows lecturers to monitor the overall PO attainment of students for their respective courses.
c) Academic advisors - monitor the PO performance of their advisees for each semester and cumulatively at the end of their study years. Can interact with their advisees through the web and can set related meetings based on the data.
d) Students - User friendly for the students to access and monitor their PO attainments for each course and their cumulative PO attainment throughout their study years. Allowed to reflect and give feedbacks to the centre of study.

POTENTIAL COMMERCIALIZATION

POSCES is system that can be applied for various engineering programme across the engineering faculties as well as across higher learning institutions. It is a data management system that can be seen as a compulsory for the engineering courses in fulfilling the requirements of the Engineering Accreditation Council (EAC) for degree programs and the Engineering Technology Accreditation Council (ETAC).

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