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Implementation of Complex Engineering Problem Solving (CEP) and Complex Engineering Activities (CEA) in Malaysian Engineering Curriculum: A Pilot Study

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Abstract

Complex problem solving is identified as a top skill required to thrive in the 4th Industrial Revolution, and it is emphasized in the Engineering Accreditation Council (EAC) Standard 12 Graduate Attributes. However, in many cases, engineering programmes lack a clear understanding of the requirements of complex engineering problems, hindering the students' mastery of problem-solving skills for real-world readiness. This paper aims to study the current implementation of complex problem solving (CEP) and complex engineering activities (CEA) in Malaysian engineering programmes. Survey questionnaires were designed to gather feedback from academicians across various institutes of higher learning (IHLs) that offer engineering programmes. The conducted test indicates that the survey instrument is reliable (Cronbach Alpha value of 0.800). The initial findings from a pilot study involving 30 respondents from 10 IHLs show that common courses chosen to address CEP and CEA are the final year project, integrated design project, and other design courses. The majority of CEP and CEA assessments are conducted on a semesterly basis, utilizing project-based assessment. Problem-based learning (PBL) is the most widely chosen teaching and learning strategy, engaging students in solving real-world problems, encouraging active participation, critical thinking, and the application of knowledge. Further research could explore the effectiveness and impact of these teaching and learning strategies on students' learning outcomes, problem-solving abilities, and their abilities to apply CEPS and CEA principles in real-world scenarios. © 2023 IEEE.

Author Keywords

assessment tools; complex engineering activities; complex engineering problems skills; engineering programmes

Index Keywords

Curricula, Engineering education, Learning systems, Teaching; Assessment tool, Complex engineering, Complex engineering activity, Complex engineering problem skill, Complex engineering problems, Engineering activities, Engineering problem solving, Engineering program, Malaysians, Pilot studies; Students

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