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# Continual Quality Improvement in Implementing Complex Engineering Problems and Complex Engineering Activities in Malaysian Engineering Programs

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## Abstract

Complex problem solving is identified as a top skill required to thrive in the 21 st century skills, and it is emphasized in the Board of Engineers Malaysia's engineering program standard. Despite the critical emphasis on complex engineering problems (CEP) and complex engineering activities (CEA) in the engineering curriculum, there is a gap in the effective implementation and operationalization of these requirements in educational settings. This paper focuses on the continual quality improvement (CQI) on the implementation of CEP and CEA in Malaysian various engineering

programs. The instrument reliability has been conducted indicating a Cronbach alpha value of 0.800. The findings based on survey questionnaires responded by 121 academicians from 22 public and private institute of higher learnings (IHLs) in Malaysia show that CQI actions related to the implementation of CEP and CEA are carried out both at course and program levels. Various suggestions for improvement indicate a robust discourse among educators on how best to enhance the teaching and assessment addressing CEP and CEA attributes across engineering curriculum. The emphasis on training, simplification, real-world integration, and student-specific strategies underscores a collective aim to refine engineering education in a way that is both effective and adaptable to current educational and industrial demands. Further research could explore the effectiveness of the CQI actions on lecturers' skills in developing CEP in the assessment, students' learning outcomes, problem-solving abilities, and their abilities to apply CEP and CEA principles in real-world scenarios. © 2024 IEEE.

## Author keywords

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

## Indexed keywords

### Engineering controlled terms

Curricula; Engineering education; Engineering research; Industrial research; Requirements engineering; Teaching

### Engineering uncontrolled terms

Assessment tool; Complex engineering; Complex engineering activity; Complex engineering problem skill; Complex engineering problems; Engineering activities; Engineering program; Malaysia; Malaysians; Quality improvement

### Engineering main heading

Students

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