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IDENTIFICATION OF COMPETENCIES DEVELOPED THROUGH PROBLEM BASED STUDENT COMPETITIONS DURING FOUNDATION YEARS: CASE STUDY OF ENGINEERING UNDERGRADUATES

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ABSTRACT

Industry demands engineering graduates to have practical skills which cannot be inculcated through traditional chalk and talk pedagogy. Engineering education today adopts outcome based teaching techniques. Researchers have found that problem based learning can improve graduate qualities such as inquiry and learning process, exposure to new skills, opportunity to practice new skills, developing teamwork and communication skills. In moving with this trend many problem based learning assignments are given to student especially towards the later years of the program. However an outcome based program should include such outcome based assignments from the early years of learning. In moving with this requirement some universities are attempting to introduce such assignments at foundation levels the effectiveness of which is not known. This study attempts to evaluate the effectiveness of such outcome based assignments given to engineering undergraduates within their early years of learning by identifying the different competencies developed within them. Four problem based case study assignments given in two universities were considered in the analysis. Using an open-ended questionnaire 402 student feedback statements were collected. These statements were used to identify different competencies developed in students as identified by the students themselves. By conducting a standard content analysis, a two level hierarchical model was constructed to explain the competencies gained by students. The upper level competencies included theoretical competencies, practical transformation competencies, critical thinking and creativity competencies, constructability competencies, engineering error management competencies, machine operating competencies and personal competencies. These outcomes could be used in planning assignments and in the process of curriculum mapping used for accreditation.

Keywords: PBL, competencies, engineering education, foundation year