

## **Relationship between the Dimensions of the Flipped Classroom Instructional Approach towards Students' Knowledge Enhancement in an Engineering Course at University of Malaya**

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A study has been conducted to investigate the relationship between various dimensions of flipped classroom instructional approach towards Knowledge Enhancement (KE) by the students of an engineering course at Universiti Malaya. The dimensions of flipped classroom being investigated were Course Content (CC), Learning Activities (LA), Collaboration (C) and Formative Assessment (FA). The course was specially designed to include all the flipped classroom dimensions, which included the specially developed CC mostly in the form of video and uploaded into Universiti Malaya's Learning Management System (LMS) - Spectrum. The online LAs were carefully designed with appropriate FAs so that students could undertake effective online learning before the attending the face-to-face classroom. In face-to-face classroom, active learning environment including group collaboration (C), facilitative and reflective activities were conducted so that meaningful and engaging learning took place. A total of 53 students enrolled in KEEE231 - Circuit Analysis were involved in this study. The questionnaire for this study was suitably adopted from Habibah et al (2015) and consisted a total of 44 items. The questionnaires were administered to the students as soon as they completed the 7-weeks course delivery via flipped classroom. The reliabilities study of the variables of the questionnaire shows high internal consistencies with Cronbach Alpha > 0.90. In this study, we treated the CC, LA, C and FA as independent variables and KE as dependent variables. Inter-items correlation study of between the independent variables and dependent variables shows that they are significantly correlated at 1% level. The subsequent multiple regression analysis revealed that they are highly correlated with  $R^2 = 0.858$ . The appropriateness of the regression model was subsequently tested with ANOVA analysis. The multiple regression results show that the CC ( $p=0.000$ ) and LA ( $p=0.035$ ) are the significant predictors towards KE attained by the students. The significant findings of the study are that the effort must be taken to ensure that CC developed must be of the highest quality to ensure that knowledge is being transferred to the students. At the same time, the learning activities must be carefully designed to align with the learning objectives so that students could attain the learning outcomes successfully.

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