STUDENTS' CONCEPTUAL UNDERSTANDING AND MISCONCEPTIONS ON FORCE AND MOTION THROUGH DIFFERENT INSTRUMENTS COMBINED WITH CERTAINTY RESPONSE INDEX (CRI)

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The main purpose of this study was to investigate the misconceptions among G.C.E. (A/L) students using different instruments. The Force Concept Inventory (FCI), Mechanics Baseline Test (MBT) and Force and Motion Conceptual Evaluation (FMCE) were the instruments combined with Certainty of Response Index (CRI) administered in this study to assess students' misconceptions and conceptual understanding. The Effects of gender on different categories of G.C.E. (A/L) students' misconceptions about force and motion were further analyzed. This study was conducted with 5 schools; 8 classes; total of 115 of G.C.E. (A/L) high school students in the academic year of 2011-2012. There were nine dependent students' total scores on the FCI and their scores on eight misconception categories (Kinematics, Impetus, Active Force, Action/Reaction Pairs, Concatenation of Influences, Other Influences on Motion, Resistance and Gravity) and five independent (students' gender, school type, MBT scores, FMCE scores, CRI values) variables involved in this study.

The results indicated that students have relatively low conceptual understanding on force and motion which is around 30% percent of the students gave correct answer respectively for FCI, MBT and FMCE tests. Furthermore, they have misconceptions in many concepts when interpreting force and motion. Therefore a well planed improvement is necessary to be conducted for replacing misconceptions. Also the statistically analyzed results using ANOVA indicated that gender difference is not effective on students' misconceptions in force and motion of the tested population and when consider the school type there is no significant effect on misconceptions of tested population for MBT and FMCE tests except for FCI.