

Effect of Instructional Method on Physics Concept Achievement at Grade Six

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Concepts of Physics, Chemistry and Biology are included in the curriculum of grades six to eleven. It is assumed that the Physics-based concepts are relatively difficult to be understood. Therefore, this study was conducted to investigate the effect of instructional methods on the achievement level of Physics-based concepts of Force, Energy and Work. Two common instructional methods, 5E and Traditional, and a method combining these two which is practically used by teachers were used. The combined method is a teacher-adapted method from the 5E model in which the exploration in 5E is done by the teacher, leaving the rest of the steps as they are. In addition, a summary note of the content is also given by the teacher for future reference. The study was conducted using 78 female students in grade 6. They were randomly divided into three classes and one experienced teacher for each instructional method was employed for the classroom teaching process of the selected Physics unit. Two specially formulated tests; namely 'Force, Energy and Work Concept Achievement Test' (FEWCAT) comprising questions with equal weights; were administered as the pre-test for assessing their prior knowledge and as the post-test for assessing the achievement level. The reliability of test items had a Cronbach α estimate of above 0.7. Classroom observations were also conducted to further investigate the teaching-learning process. The quantitative data were statistically analysed using the Analysis of Covariance test (ANCOVA) and Tukey's test in which pretest scores were considered as the covariate.

The statistical analyses revealed that the combined method of instruction was better than two other methods in achieving abstract concepts of Physics. Further, the effectiveness of the traditional and the 5E instructional methods are found to be the same. The qualitative data revealed that the students were very active under 5E method but they learn the content limited to their group and had no written materials for refreshing their knowledge. In the traditional method, students were passive but had a very good content note. The combined method provided active learning while receiving a systematic content note at the end of the lesson. This combination was more effective for scientific concept achievement than traditional style instruction or 5E model.