



EFFECT OF A DEVELOPED PHYSICS LABORATORY MANUAL ON THE CONCEPTUAL UNDERSTANDING OF INDUSTRIAL TECHNOLOGY STUDENTS

FAITH CELESTE B. OLE

0000-0001-6248-4168

faith.celeste29@gmail.com, faith.celeste.ole@chmsc.edu.ph

Carlos Hilado Memorial State College, Talisay City, Negros Occidental, Philippines

ABSTRACT

The importance of instructional materials serves as a primary source of science learning content for both students and teachers. Due to the need of the institution to develop instructional materials as recommended during its AACCUP visit and similarly supported by CHED's Memorandum Order 46 s. 2012. This research endeavor aims to find out the effect of a developed laboratory manual in Physics on the conceptual understanding of Industrial Technology students. A pretest-posttest matched group design with experimental and control groups, each consisted of 21 students underwent matching procedures are used in the conduct of this study. A t-test for matched pairs reveals that both groups have a significant difference between pre-test and post-test wherein the experimental and control group obtained t-values of 11.16 and 10.80, respectively. Cohen's d effect size measure is also employed to measure the practical significance of the instructional material. This effect size can be operationally defined as learning gains due to experimental treatment. The results reveal that the administration of the laboratory manual in Physics as part of classroom instruction gained a large effect ($d = 2.435$) in making students understand the concepts in General Physics. Numerically, the experimental group has a greater effect size of 0.077 as compared to the control group. However, we cannot also deny the large effect brought by the conventional method of the control group ($d = 2.358$) in enhancing the conceptual understanding. Based on these results, the developed laboratory manual in Physics is found to be more effective in enhancing the conceptual understanding in its Physics laboratory class than the conventional or lecture method only. Thus, this positive result of evaluating the learning material strongly supports the utilization of such material for institutional use.

Keywords: Physics education, instructional material and conceptual understanding, quasi-experimental quantitative research, Philippines