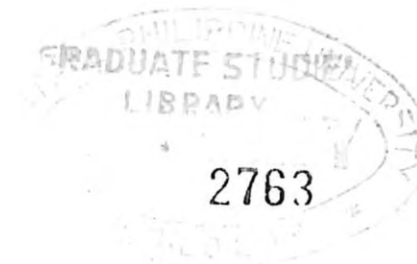


**THE EFFECT OF THE USE OF ULTRASONIC SENSORS INTERFACED WITH
COMPUTER ON THE PERFORMANCE OF SOPHOMORE STUDENTS
IN COLLEGE PHYSICS AT CENTRAL PHILIPPINE UNIVERSITY**



A Thesis

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MASTER OF ARTS IN EDUCATION
(Major in Physics)**

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March, 2010**

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by

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ABSTRACT

This study aimed to compare the effect of the use of ultrasonic sensors interfaced with computer and traditional lecture-discussion method on the performance of sophomore students in College Physics at Central Philippine University during the academic year 2009 - 2010. The population of this study was the AHSE Sophomore students enrolled in College Physics for Health Sciences at Central Philippine University during the second semester of academic year 2009-2010. Two (2) sections assigned to the researcher were considered in the study. One section comprised the experimental group and the other section as controlled group. The subject of this study was limited only to the level two students of the College of Nursing enrolled in College Physics for Health Sciences during the second semester of academic year 2009 – 2010. The variables of this study included traditional lecture-demonstration and the use of ultrasonic sensor interfaced with computer as independent variable and performance in College Physics specifically in Motion and Free Falling Body as the dependent variable. The study was conducted at Central Philippine University and utilized a teacher-made test prepared by the researcher coupled with the PASCO Scientific Lab prepared questions on the activities such as (a) Understanding Motion (Position and Time) (b) Understanding

Motion (Velocity and Time) (c) Acceleration on an Incline, (d) Acceleration of a Free Falling Picket Fence (Photogate) and (e) Acceleration Due to Gravity. The materials and equipment used for the experimental group utilized the purchased variety of interfaces and sensors (probes) bundled with computer from the PASCO Scientific, the global leader in developing technology-based solutions for hands-on science. The teacher-made questions included definition of terms, comprehension and application (30%), discussion and analysis (20%) and PASCO Lab Report graph on the analysis of experimental data (50%). The data gathered from the sources were coded and encoded for computer processing. The Statistical Package for Social Sciences (SPSS) for Windows was used for the statistical analysis of the study. Analysis of all data was done using descriptive-comparative analysis. Frequency distribution, mean and standard deviations were used to measure central tendencies and dispersion of data respectively. To determine the significance of the differences between means, the t-test were computed and analyzed. Significance level was set at .05 using two-tailed tests. Students who were grouped into control and experimental groups perform almost the same in college physics pretest. Students who were grouped into control and experimental groups perform almost the same in college physics posttest. Performance of students in the control group does not vary with the performance of students in the experimental group before the treatment. Performance of students in the control group before the treatment differs from the performance after the treatment. Performance of students in the experimental group before the treatment differs from the performance after the treatment. Performance of the students in college physics in the control group does not vary with the performance of the students in the experimental group after the treatment. The change in performance of

students in the experimental group does not vary with the change in performance of students in the control group. The use of ultrasonic sensors interfaced with computer in teaching physics has no bearing on the performance of students in college physics. Methods of teaching used in college physics have no bearing on the performance of students in college physics. From the result of the study, it can be concluded that the use of ultrasonic sensors interfaced with computer in teaching physics has no effect in the performance of students in college physics. Based on the above findings, the following are recommended: (1.) Although the use of ultrasonic sensors interfaced with computer in teaching college physics has no bearing on the performance of students from the College of Nursing, it is recommended that assessment of teacher's presentation be made for possible improvement for those who will conduct similar study. (2.) Since the performance of students who were taught college physics using ultrasonic sensors interfaced with computer does not vary with the performance of students using traditional lecture-discussion method, it is recommended that another study be conducted to determine better strategies to improve the performance of the students. (3.) The use of PASCO bundles (interfaces and sensors) is used in teaching physics for the purpose of keeping abreast with the advance technology. Exposure to learning experiences using this technology will make students gain confidence in future work places; be it in hospitals, business establishments, industries, educational institutions including research and many others. It is recommended therefore that trainings not only on the operations of the sensors but also presentation of the lessons be conducted to serve the purpose, to attain the learning objectives and hopefully improve students' performances. (4.) Considering the limitation of this study, the following are recommended for further verification of the

effectiveness of the use of ultrasonic sensors interfaced with computer: (a.) The experimental group should be exposed to more topics, not just two. (b.) Pretest-posttest for every topic should be conducted. (c.) More set of bundles should be used by students to develop skills in the operations and analytical thinking. (d.) Additional information about the respondents like high school physics grade should be considered in the pairing. This may have bearing on the performance in college physics. (5.) A similar study be conducted to considering other group of students from the other colleges like computer and IT students, engineering and Arts students as population.