

**EFFECTIVENESS OF USING WEB-BASED MATERIALS IN TEACHING
SIMPLE HARMONIC MOTION FOR GCE (A/L) STUDENTS:
A CASE STUDY IN GAMPAHA DISTRICT, SRI LANKA**

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In the Sri Lankan education system, traditional lecture methods are used to teach Combined Mathematics. Simple Harmonic Motion is one such lesson taught in Combined Mathematics for GCE (A/L) students. The primary purpose of this study is to develop a new teaching material to improve the performance level of students who are attempting simple harmonic motion questions at the GCE (A/L) examination. Past research revealed that computer-assisted teaching and learning processes encourage students' performance in mathematics. Students (206) and teachers (15) were selected from four schools through a convenience sampling technique in the Gampaha District in the Western Province, Sri Lanka. In this study, both qualitative and quantitative data were used. A pre-test, a post-test, a questionnaire, and semi-structured interview schedules were used to collect data. Quantitative data were analysed using SPSS 22.0, and qualitative data were analysed using thematic analysis. Using pre-test results, students were assigned into two homogeneous groups, an experimental group and a control group. The experimental group was instructed with web-based assisted material with structured essay-type questions, while the control group was taught using the lecture method. The results revealed that there was no significant difference between the pre-test marks in the control (51.8 ± 32.3) and experimental (52.6 ± 31.8) groups: $t_{(204)} = 0.185$, $p = 0.854$. However, the findings showed that there was a significant difference in the mean values of post-test marks for control (56.6 ± 26.1) and experimental (69.8 ± 23.3) groups; $t_{(204)} = 3.835$, $p = 0.0001$ after the intervention. As such, the new teaching material developed using web-based resources and the structured type problems positively affect the student performance level in simple harmonic motion lessons. Thus, it is suggested to use such strategies to enhance student performance through meaningful learning.

Keywords: Computer-assisted learning, Simple harmonic motion, Teaching materials