LEARNING DIFFICULTIES OF G.C.E. (A/L) COMBINED MATHEMATICS STUDENTS IN NEWTON'S LAWS OF MOTION

A PROJECT REPORT PRESENTED BY

SINNARAJAH KANDEEPAN

to the Board of Study in Science Education of the

POSTGRADUATE INSTITUTE OF SCIENCE

in partial fulfillment of the requirement

for the award of the degree of

MASTER OF SCIENCE IN SEIENCE EDUCATION

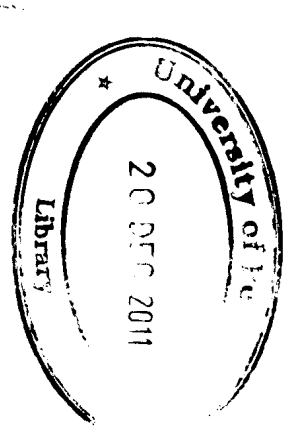
of the

UNIVERSITY OF PERADENIYA

SRI LANKA

2011

LEARNING DIFFICULTIES OF G.C.E. (A/L) COMBINED MATHEMATICS STUDENTS IN NEWTON'S LAWS OF MOTION



S. Kandeepan

Postgraduate Institute of Science
University of Peradeniya
Peradeniya
Sri Lanka

Abstract

Newton's laws of motion is one of the most important sections in the Combined Mathematics syllabus. A total of 25 periods are allocated for teaching *Newton's laws of motion.* Though this section is not difficult, a large number of students face difficulties in answering questions due to misunderstanding and misconceptions. Inability to draw the force diagram correctly, failure to use the appropriate equations and incorrect approaches to solving problems also contribute towards students' performance at the examinations.

The purpose of this study is to identify the learning difficulties in the study of Newton's laws of motion in the G.C.E (A/L) Combined Mathematics subject and then to suggest remedial measures to eliminate the identified learning difficulties.

The content boundaries considered are based on the objectives outlined in the G.C.E (A/L) Combined Mathematics syllabus which includes the study of Newton's laws of motion. A diagnostic test was administered to 83 G.C.E. Advanced level students from four national schools in the Trincomalee district to identify learning difficulties. The responses of the students to the diagnostic test were scrutinized to find out the difficulties faced by the students in learning Newton's laws of motion. A questionnaire was

administered to 10 teachers from various schools in the Trincomalee Zone to obtain views of teachers on the difficulties encountered in the teaching and learning process. The responses to the questionnaire were studied and the teachers were personally interviewed with a view to make suggestions to overcome the learning difficulties of students.

Thirty two students who scored low marks in the Diagnostic test were selected and remedial teaching was done using the worksheets method by dividing them into six groups. Later a posttest was conducted and the results were obtained. After administering the post test, a statistical analysis was used to compare their performance in the pretest and the post test.

The abstract nature of the concepts involved in Newton's laws of motion seems to be the cause of difficulties experienced by most students. The results of this research shows that the methods adapted here are well-suited for the study of Newton's laws of motion. Other remedial measures are also suggested based on the findings of our study.