

530
KUM

**DEVELOPING AND TESTING THE INFLUENCE OF
DEMONSTRATIONS IN TEACHING ELECTROSTATIC UNIT FOR
G. C. E. A/L STUDENTS**

A PROJECT REPORT PRESENTED BY

B. A. SANATH KUMARA

to the Board of Study in Science Education of the
POSTGRADUATE INSTITUTE OF SCIENCE

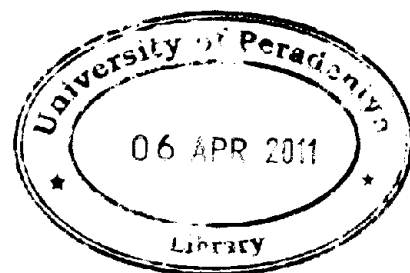
In partial fulfillment of the requirement
for the award of the degree of

MASTER OF SCIENCE IN SCIENCE EDUCATION

of the

**UNIVERSITY OF PERADENIYA
SRILANKA
2010**

645736



**DEVELOPING AND TESTING THE INFLUENCE OF
DEMONSTRATIONS IN TEACHING ELECTROSTATIC UNIT FOR
G. C. E. A/L STUDENTS**

B. A. S. Kumara

Postgraduate Institute of Science

University of Peradeniya

Peradeniya

Sri Lanka

Among the most effective learning methods, active based learning helps students to achieve through knowledge. Especially when teaching Physics, there are more chances to make students active. Demonstration experiments can be used for this purpose. The factors like vast syllabus of Physics, lack of time to be spent to get ready for the experiments, lack of the students' attendances do not permit to cover all the experiments given. By giving a questionnaire to students as well as Physics teachers, it was identified that electrostatic sub unit is relatively difficult. So the teachers show lukewarm interest to do these experiments. It reduces the problem solving ability in Physics and causes to show much weakness when they are given problems with day to day activities.

In this study a set of demonstration experiments were introduced because there are lack of experiments for electrostatic sub unit in the experiment list recommended for A/L Physics syllabus. The demonstrations are aimed at comprehension and application of a general principle to specific instances. The demonstration instruments which are commonly available in school laboratory as well as the low cost materials from the surrounding were utilized. These demonstrations can be used to give a thorough understanding about the concepts in flux lines, repulsive and attractive forces among electrical charges, dielectricity, momentum, action and reaction, equipotential surfaces, as well as the action of the smoke precipitator and the action of the gold leaf electroscope. They can be used not only for giving knowledge but also for creating pleasant environment in the classroom and enhances student –teacher interaction.

The demonstration, smoke precipitator gives an idea about the scientific process behind a smoke precipitation. Bob oscillator demonstration has been designed to demonstrate attractive and repulsive forces among charged bodies. Particle charger shows the way of charging the bodies by friction. Electric field line demonstration experiment demonstrates the characteristics of flux lines. A demonstration was designed to calibrate a gold leaf electroscope to measure the high voltages and another demonstration was produced to demonstrate equipotential surfaces around a point charge, around a charged metallic sphere and around a charged plate with the help of the calibrated gold leaf electroscope. Finally a simple electric charge detector was introduced to identify the charged objects.

Results of these demonstrations were highly agreed with the theories. The demonstrations were tested with an experimental and a control group of students to study the effectiveness of the experiments towards the teaching-learning process.