DEMONSTRATION EXPERIMENTS FOR TEACHING MAGNETIC PHENOMENA FOR G.C.E. (ADVANCED LEVEL) STUDENTS

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As students step into the wider society after their Advanced Level examinations, they face a complex and competitive world of work. The diverse equipment and machinery used in different fields make wide use of magnetic field of some sort. Therefore, it is quite advantageous for those who enter tomorrow's job market to have an understanding of such uses and also of developing such equipment. Even in the environment, we commonly see natural phenomena that have magnetic field involved in them. To explore these also we need to know the concepts of magnetism.

But, as we consider the syllabus of Physics for A/L and other relevant materials, it has been identified that there is a need for an enhanced practical teaching – learning process in order to make them understand the concepts related to magnetic fields, as they are complicated and hard to understand.

An effort has been made to identify the difficulties faced by students and teachers involved in the process of learning and teaching this unit. In addition, considering the weaknesses of the prevailing educational methods in our country and being inspired by the new findings in the field of education. It is important to introduce new teaching-

involvement of both the teacher and the students through a process of student centered activities and interactive learning methods are very useful to teaching-learning process of magnetic field in Advanced Level Physics.

The main objective of this thesis is designing and construction of laboratory and demonstration experiments as activities. Furthermore, a Unit Plan has been designed in order to implement the new method to teach the above sub-unit in the classroom.
In order to assess the success of the teaching –learning process with new laboratory and demonstration experiment, a series of introductory workshops have been conducted separately for teachers and students. The feedback from the teachers and the students at the end of the workshops also has been made use of.

The first laboratory experiment uses an apparatus named 'Magnetic Field Balance' which is capable of measuring the intensity of a magnetic field. In this activity, one can calculate the field intensity of a horse-shoe magnet accurately. It is also suitable to demonstrate inverse square low of magnetic fields and to demonstrate attractive and repulsive forces between two parallel current carrying conductors.

The second and third experiments are to calculate the intensity of the earth magnetic field using the features of the resultant magnetic field between the earth magnetic field and the magnetic field around a straight and vertical current carrying conductor.

In addition, a series of model experiments have been designed to consolidate the relevant concepts. All these experiment kits have been designed in a way that they can be fabricated easily using cheaply available common materials.

The materials needed, instructions for setting up of the apparatus, operating instructions and principles, instructions for calculations in the case of laboratory experiments and a discussion which can be useful to make the experiments more successful are also included.

The interviews conducted with the teachers and students at the end of workshops meant for introducing the new teaching method to the field, have revealed that the newly introduced method is more effective in comparison to the traditional method in providing the necessary skills regarding magnetic fields.