

**A SUITABLE APPROACH TO INTRODUCE
ENVIRONMENTAL ASPECTS IN LABORATORY
EDUCATION**

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Abstract

The overall economic stability of a country depends to a great extent on the development of industries. In order to achieve sustainable development in the industrial sector, it is necessary that these development projects are well planned. Development projects which are not planned properly tend to create crucial environmental problems. To minimise the environmental damage, these development activities should be handled by experts in these fields. Tertiary level education plays a vital role in producing professionals and experts in different fields. It is the responsibility of relevant authorities to make sure that those passing out from the universities are well aware of the sources of environmental pollution and the cleaner technologies of pollution prevention.

The present tertiary education system related to environmental aspects, in Sri Lankan universities offers very few courses in undergraduate teaching programmes. However, major improvements related to environmental education need to be done in undergraduate teaching programmes, in order to educate those passing out from these institutions on these aspects.

The main objective of this project is to introduce suitable approaches to teach environmental aspects as part of the laboratory education at tertiary level. In order to achieve this objective several undergraduate teaching methods have been designed. In this programme, it is suggested to link the environmental aspects to undergraduate courses in an integrated manner.

The entire programme is mostly based on the concept called 3A's and 3R's. Development of Awareness, Attitude, Ability of students is the initial step. Practicing Recycling, Reusing and Rendering methods within the laboratory is the implementation process of the resource management programme.

Awareness programmes have been designed using different methods. Information related to good laboratory practices, safety in laboratory, and laboratory management techniques are included in safety manuals and in leaflets. As a new approach, a software package has been introduced, which consists of descriptive information on chemical industries, their manufacturing processes, associated environmental problems and waste treatment methods.

Undergraduate programmes on laboratory management and environmental management, based on the latest quality management systems have been designed. The programmes proposed can be introduced to undergraduates in any academic stream. It is necessary to educate undergraduates on the quality management systems; ISO Guide 25, ISO 9000 and ISO 14001 to gear them to face challenges in the next millenium.

The resource management programme designed, has already been introduced to students in the inorganic chemistry laboratory. The laboratory arrangement was modified as the initial step. All the experiments were re-designed; eliminating hazardous chemicals, minimising the cost and the waste produced. Designing of a

small scale wastewater treatment plant to treat laboratory wastewater is another approach to educate students on the application of waste treatment methods. When introducing environmental aspects in laboratory education, it is essential to relate those to the experiments conducted in the laboratory. Therefore, several model experiments on sample analysis based on spectrophotometry have been designed. This approach is based on a special experimental scheme and is more directed towards changing the attitude of students and make them responsible for their studies in the laboratory.