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# **Student teachers' perceptions about education for sustainable development (ESD) in secondary science education**

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## **Background**

Nowadays Sri Lanka faces lot of sustainability issues. To provide a proper education and awareness to the community and general public is one of the more effective strategies to solve these problems. ESD-enriched Education forms the foundations for these initiatives. Out of the subjects in the secondary curriculum, Science is the most relevant subject to impart knowledge, attitudes, skills and values regarding ESD to the students.

## **Research Problem**

Student teachers are the leading actors in the process of developing ESD, (Kilinc & Aydin 2013) and they would be vital for educational change (Bursjoo 2011). But in Sri Lanka science teacher education programmes do not have enough ESD opportunities and as a result, student teachers also do not have an adequate understanding regarding ESD, in comparison to other developed and developing countries. An evaluation of their perceptions regarding ESD is important for the implementation process of ESD into the Sri Lankan general education to achieve UNESCO's of Sustainable Development (2005 to 2014).

## Objectives of the Study

The objective of the study is to identify student-teacher perceptions about

- the concept of Sustainable Development;
- ESD components in secondary science curriculum, pedagogy and teacher training;
- Constraints and challenges in the implementation process and strategies for addressing these challenges.

## Research Methodology

The study is planned to follow a survey research method, using both quantitative and qualitative approaches. Questionnaire and interview methods are employed for data collection. Questionnaire was adopted from the earlier studies (Zachariou & Kadji-Beltran 2009, Summers, Corney, Childs 2004). The study sample consists of 18 PGDE students of the University of the Jaffna and 18 BEd students of the NIE at the Jaffna regional centre. All student teachers in the study sample are teaching science in secondary classes. Data was analyzed quantitatively and qualitatively. Simple statistical techniques such as mean and standard deviation are used to explain quantitative data.

## Key Findings

The results show that a majority of student teachers have poor understanding about the concept of Sustainable Development. Notable findings were that substantial numbers recognized the centrality of environmental (46.66%), economic (26.66%) and social (26.66%) factors, but just 11.11% highlighted all three. They addressed much importance to the sustainability issues of health education, road safety and environmental education. And also they showed low importance to multicultural education, voluntarism and consumer education. Various sustainable development issues have been addressed at different levels in their schools during the past year.

Looking a little further into the findings, the relationships of perceptions with regard to gender and the category of student teachers in the study sample was examined. The results suggest significant difference between males and

females in their perception of the concept of Sustainable Development. And also significant difference was observed between PGDE and BEd students for the same aspect.

All in the study sample agreed that there are opportunities to develop ESD concepts in the secondary science curriculum, and 91% of student teachers agreed that there is vertical and horizontal integration of ESD related topics.

Their perceptions about ESD aspects in secondary science syllabus varied in respect of the themes found in the respective grades. Elaborating further, all student teachers have perceived the existence of the themes of "Usage of modern technical apparatus", and "Sustainable food production" in all the grades from 6 to 11. Existence of the themes of "Awareness about disaster management", and "Biodiversity protection" found in grades 6 to 9 too have been perceived well. While theme on "Renewable energy" is included in grades 7 and 9, themes "Waste management", "Human diseases", "Effective usage of natural resources" and "Industrial Productions" are each found only in a single grade respectively in grades 9, 10 and 11.

Student teachers' occasionally used the ESD related teaching learning processes such as field trips, visit to school garden, and practical work, and rarely engaged the methods of science exhibitions, science club activities and educational tours.

There are several constraints and challenges faced by schools in the implementation process of ESD. None had received training regarding ESD directly, but they had obtained training regarding ESD related subtopics such as first aid, child rights, human rights, family health, prevention from dengue and disaster management which were organized by Ministry of Education, NIE and NGO's. They perceived a lack of support within the school community and the immediate environment outside the school. Few principals, teachers, students, and parents have exhibited negative attitudes about implementation of ESD within the school.

They also made recommendations for strategies for addressing the above challenges such as; enrichment of the secondary science curriculum with further ESD components, inclusion of more practical work and out of school science activities in pedagogy, more involvement by the government and

non- Government organizations in providing proper training and support in ESD . Finally they suggest that Science teacher education programs should also include the ESD aspects in their contents.

## Conclusions

A majority of student teachers had little understanding about the concepts of Sustainable development. Sustainable development issues have been approached at different levels in their schools during the past year. Schools faced lot of problems in the implementation of ESD.

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