The Ranking of Science, Technology and Society (STS) Issues by Students and Physics Teachers in Secondary School, Yemen

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ABSTRACT

Science, Technology and Society (STS) issues encompass social dilemmas with conceptual or technological links to science. Investigating the ranking STS issues that given by secondary school students and their teachers in Yemen is the major aim of this paper. It reviews the literature in order to seek for STS issues that should be infused in physics curriculum in Yemen. Then, it reports the results of the survey that measure the ranking of Science, Technology and Society issues. A valid and reliable questionnaire containing STS issues is administered on a sample of 465 students and 34 teachers from 15 schools in Sana’a city. The results of the study revealed that human health and disease, water supplies, air pollution, and energy shortages are the most important issues that should be infused in physics curriculum in Yemen. When the mean scores of students and teachers were compared, the results showed no significant differences. Implications for research and development in science education are discussed.

Keywords: Physics Curriculum, Science, Secondary School, Science-Technology-Society (STS), STS Issues

INTRODUCTION

In the midst of discussion and debate concerning educational reform, Science-Technology-Society (S-T-S) has been suggested as a new conceptual organization for science education (Bybee & Mau, 1986). STS education provides the students with a real-world connection between the classroom and society. It helps the students practise identifying potential problems, collect data with regard to the problem, consider alternative solutions and the consequences of a particular decision (Yager, 1990). STS approach
become one of the current goals for science education, it attempts to place as much emphasis on technology and society as on science in presenting a coherent view of the relationship between these three strands. Figure 1 symbolizes the relationships between science, technology, and society (Rubba et al., 1995; Waks, 1992).

STS means starting with students, their questions, using resources available to work for their resolution, and wherever possible, advancing to the stage of taking actual actions individually and in groups to resolve actual issues.

STS approach is expected to increase general interest and understanding of science. It is also expected to fill a critical void in the traditional curriculum. Harms and Yager (1993) further derive four main purposes of the STS approach, namely:

1. Preparing students to use science for improving their own lives and as a corollary to be able to better understand and cope with an increasingly technological society.
2. Enabling students as they progress through life to deal with STS issues in a responsible manner.
3. Identifying a body of knowledge that would enable them to deal with STS issues.
4. Acquiring knowledge and understanding about career opportunities in the field. Enabling the students plan for their careers by comprehending the possible job opportunities available in their job market.

This allows students to relate the scientific concepts to problems they may have already encountered, makes science curricula to be closely related to their life in order to strengthen their understanding of the concepts, reaction of STS, and develops self-learning in the future in order to be good citizens and have the ability to make use of science as well as technology to help contribute to their societies. Yager and Lutz (1995) point out that there is an increasing interest in the infusion of STS issues in science curriculum. They give the following reasons for including social issues in school science courses:

1. It justifies information included in science courses.
2. It allows students to find science classes relevant to their daily lives.
3. It enables teachers to evaluate students’ success at application and synthesis of ideas.
4. It redefines the teacher’s role to be “facilitator,” and relegates the textbook status to “information source.
5. It may allow for increased scientific understanding of concepts based on cognitive theories of learning.
6. It provides a vehicle for tying the whole school program together.

STS science content is dealing mainly with social issues that connect science with a societal problem; it derived from students and teachers constructing problems and investigations from real-world issues and concerns. Therefore, the starting point for STS content is a list of possible social issues that might interest the students. However, there are two types of social issues in STS science:
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