Chapter 11
Science, Technology, and Society (STS) Issues:
A Survey of Secondary Students in Sana'a, Yemen

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ABSTRACT

This chapter discusses the results of a survey of secondary school students in Sana'a city regarding Science, Technology, and Society (STS) issues. Firstly, the chapter reviews the literature in order to seek for STS issues that should be infused into the science curriculum in Yemen. Secondly, it reports the results of the survey ranking Science, Technology, and Society issues. A valid and reliable questionnaire containing STS issues is administered to a sample of 418 students from 14 schools in Sana'a city. The results of the study reveal that the most salient issues that must be infused into the science curriculum are human health and disease, water supplies, air pollution, and energy shortages. Comparing the mean scores of males and female students, the results show significant differences in 5 themes. Implications for research and development in science education are discussed.

INTRODUCTION

With the rapid development of science and its technical applications changes the human's lifestyle and their ways of thinking both negatively and positively. This rapid changing society need for the educational system to harmonize with those changes. Therefore, students must be prepared to understand technological innovation, the produc-tivity of technology, the impact of the products of technology on the quality of life, and the need for a critical evaluation of societal matters involving the consequences of technology (Bybee et al., 1991). To achieve this, science education should describe the role of science and technology as a way of solving current problems in light of the advantages and disadvantages of science and technology (Bakar, Bal, & Akcay, 2006).

Hence, many scholars of education believed in using constructivism practices in education in general and science education in particular. The features of constructivism contribute to the production of a scientifically literate person. From the constructivist perspective, that occurs when new experiences are related to what students already know and by encouraging student discussion, social negotiation and cooperative learning. Likewise, making responsible decisions for resolving problems related to science and technology address one of the most important goals for future citizens and leaders. The STS approach serves an excellent way to achieve this aim (Bakar, Bal, & Akcay, 2006). In addition to the building of scientifically literate citizens, various researchers have found that the study of STS or using social and technological issues as the context of the study of school science affects the attitudes and achievement of students. Learning science in an STS context enhances creativity, improves attitudes, increases academic achievement, and expands the use of science in daily life (Pedersen & Totten, 2001).

STS is one of a modern trend of constructivism, it 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 practice identifying potential problems, collect data with regard to the problem, consider alternative solutions and the consequences of a particular decision (Yager, 1990). 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 and to fill a critical void in the traditional curriculum. Harms and Yager (Yager, 1993) further derive four main purposes of the STS approach, namely:

1. Preparing students 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 and make science curricula to be closely related to their life. Schools today, and especially science curricula, have an obligation to immerse students in the rigorous study of the interrelationship of STS and to assist them in understanding the varied and significant ramifications of such social issues. Many science educators propose that STS issues are an appropriate avenue by which controversial social technological issues should be incorporated into the classroom (Pedersen & Totten, 2001).

RATIONALE

The goal of science education is to develop students' capacities to function as responsible citizens in a world increasingly affected by science and technology. Thus, students will need to understand the interactions between science-technology and their society (Aikenhead, 2005). Consequently, science curriculum might be able to create citizens who understand science in ways that will enable them to participate intelligently and to make decisions on how science and technology can change the society. Such science curriculum is human and society focused, problem centered, and responsive

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