



Science/Technology Education in Church-Related Colleges and Universities

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Developments in Science/Technology/Society Curricula at the Secondary Level and How Colleges Can Connect and Continue

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Developments in Science/Technology/Society Curricula at the Secondary Level and How Colleges Can Connect and Continue

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Secondary schools, with their required courses, are really good examples of a “liberal arts core curriculum,” since they usually require English, History, Mathematics, Social Studies, Science, Fine Arts, Practical Arts, Foreign Language and Physical Education, plus Religion, if the school is religion-affiliated. Most require at least one year of science and two of math, though many require 2-3 units of science and 2-3 of math, and these are certainly recommended for college-bound students. However, each topic was often taught without any connection to the others, and seldom in the context of societal implications, the effects of technology on our society, or of the ethical values involved.

STS issues obviously need to be emphasized in high school science classes because:

- (1) For many students, these are the only sciences they will take.
- (2) Many colleges have not arranged special courses emphasizing STS issues for non-science or science majors. Just because a student is a science major does not mean that he or she has been alerted to or forced to consider the implications of science/engineering/technology for society. In fact, just the opposite is probably true: science, computer, medicine, engineering majors are usually so deeply involved in content courses that they don't take time to think of the future effects on society of their science, their computer, their medicine or their engineering careers.
- (3) Some secondary administrators and teachers pay pious lip service to the ideal of team teaching theology/science or social studies/ecology or biology/ethics. However, because of scheduling difficulties, lack of released time for the involved faculty and other nitty-gritty problems, in actual practice these efforts and courses are minuscule in number.

In the past ten years or so, a number of so-called “STS” courses have been developed in most areas of secondary science. A few of these developments are:

Chemistry: The American Chemical Society's ChemCom curriculum which stresses the interrelation of chemicals, the environment and society; CEPUP (Chemical Education for Public Understanding Program) from the Lawrence Hall of Science; Chemical Manufacturing Association's ChemEcology magazine; the TIE (Teachers, Industry and the Environment) program which originated with the Chemical Council of Missouri.

Biology: The Monsanto Fund has made a commitment of at least \$150,000 for biotechnology education at the secondary, junior high and elementary level, starting first in St. Louis and then moving across the nation; Cold Spring Harbor has a group of scientists crossing the U.S. in a van, giving genetic engineering programs to secondary teachers, one week in each location; the University of Wisconsin has pioneered a kind of “fast plants” which can be used by elementary students in the study of genetics; the BSCS group has funded summer internships in immunology, with the pilot program having been held at Washington University this past summer.

Physics: Physics publications have emphasized in the last year such issues as the cold-fusion confusion, nuclear waste storage, super-collider expenditures, Star Wars and Space Lab plans; the recent success of the space probes to Neptune; atmospheric problems with the ozone hole and the greenhouse effect.

Medicine: All the above-mentioned sciences, plus engineering and computers/math converge upon ethics in the medical field, (and it appears to be a collision course!) with some terrible decisions facing our descendants in the years 2000 and beyond.

From the vantage point of a secondary teacher, I would also like to encourage colleges to:

- (1) Develop out-reach activities for their science students and professors, to get them out into the community to explain science to Mr. and Mrs. Average and their kids in the schools and in the shopping malls; to give talks and demonstrations for Senior Citizen groups and civic clubs;
- (2) Create coalitions between area scientists, engineers and mathematicians and the local college faculties, to address STS-community issues such as recycling, water pollution, biomedical ethics and biotechnology issues; involve secondary teachers in these programs.
- (3) Establish formal liaisons between college faculties and their counterparts in the high schools, junior highs and elementary schools; some programs like this already exist, such as the Partnership and Bridge Programs at UMSL (University of Missouri-St. Louis), but they need to be expanded.
- (4) Encourage more women and minorities to go into science/technology careers; until we get this under-utilized portion of the population into the mainstream of modern society, we will be unable even to communicate with them on STS issues.

This paper is meant to be a rather informal and incomplete listing, so that any of the participants at the conference who are not familiar with secondary programs can get a feel for what is going on. The author notes that, for the sake of brevity, she has not included many STS programs such as the one sponsored by Rustum Roy at Penn State.

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