Trends

Science

ROBERT E. YAGER AND JOHN E. PENICK

Technology—A New Connection in Science Education

During the twenty years after Sputnik was launched in 1957, one of the changes characterizing the new science programs was the omission of all applied science and an emphasis on pure science. This split has been a major schism. Technology—the applications of science for human betterment—was rarely found in programs or in textbooks. Health was relegated to physical education, nutrition to home economics, transportation and communication to industrial arts, and social implications or problems to social studies. With this systematic purge of technology, applications, and issues, school science was destined to be pure, suitable for all, and inherently interesting. But few students saw themselves as scientists, and, in reality, it has proven to be inappropriate for most.

During the '80s, the most significant trend has been the emergence of technology as a dominant part of science programs. A curriculum emphasizing the study of technology has been developed by the Agency for Instructional Technology and the Center for Occupational Research and Development. "Principles of Technology" is a two-year sequence recommended for eleventh and twelfth grades. In some states science/technology/society (S/T/S) programs are being developed for grades seven through twelve. Major projects have emerged in Colorado, Iowa, Pennsylvania, Utah, and Wisconsin. In many instances these new programs are developed cooperatively with funds from the state, industry, and community organizations. S/T/S is worldwide—with significant efforts in Australia, India, Israel, Thailand, and the U.K. Only during the past four years have these efforts been prominent in the U.S.

The Science Education Directorate of The National Science Foundation, the federal agency supporting our efforts in science education since Sputnik, has been renamed the Directorate for Science and Engineering Education. The directorate has funded major projects to emphasize technology as a vital part of school science. The American Association for the Advancement of Science has long had an Office of Science Education, now titled the Office of Science and Technology Education—another indication of the growing importance of technology as a central ingredient in school science. During 1981, the U.S. House of Representatives approved a Technology Education Act to encourage colleges and schools to promote technology education projects.

Efforts in most states for improving science education now include an introduction of techology and a focus on societal issues. In New York and many other places, technology has long been a primary focus for the junior high years. This is consistent with the recommendations of the National Science Board's expert task force that elementary schools focus on science that affects individuals and communities, followed by a required course in ninth and tenth grades that interrelates science, technology, and society.

Technology—including all the advances that affect every human being daily and all the problems it creates—gives meaning and relevance to science. Technology further provides a connection for students to the real world and may be our greatest hope for providing appropriate science for all.□

Robert E. Yager and **John E. Penick** are Professors of Science Education, University of Iowa, Iowa City, IA 52242.

Business Education

CALFREY C. CALHOUN

National Standards Reflect Technological Change

For the first time business education at the secondary, postsecondary, and adult levels has nationally validated standards for excellence.[1] Developed under a contract between the Office of Vocational and Adult Education of the U.S. Department of Education and the School of Technology at East Carolina University, the standards have implications for developing or revising courses, updating programs, and identifying information processing competencies needed by business educators. The standards booklet includes directions for assessment and identification of areas needing improvement as well as a procedure for using that information to plan and systematically implement corrective measures.

Since the standards are generic, they are adaptable to any school or system's needs. For instance, they may be used to update the content of a business program by focusing on revision of the objectives of information processing courses. As an evaluation instrument, they may be used to develop a profile of a program's strengths and weaknesses. A department, system, or state might develop its own profile along with a list of improvements needed and procedures for implementation. Teachers can use the standards to prepare a personal plan for professional growth, and teacher trainers can compare their curriculums against competencies needed by business teachers.

Nationally developed standards signify that business education is of