

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 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 technology 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. □

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Business Education

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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 compe-

tenencies 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

sound quality and deserving of public support. Schools subscribing to the standards are meeting their broader social responsibility by promoting the pursuit of excellence in a major component of education. □

1. *Standards of Excellence in Business Education* is available from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402 (Stock No. 065-000-00236-1, \$4.75).

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Reading

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How Should Reading Be Taught in Kindergarten?

The issue of reading instruction's place in kindergarten classrooms sparks immediate and often emotional response from supervisors, administrators, teachers, and parents. Those who are against reading in kindergarten argue that most five-year-olds are not ready for it and that the primary responsibility of kindergartens is to develop social, physical, conceptual, and language abilities. The advocates point out that many children are ready, especially those who have attended preschool programs that teach some traditional kindergarten skills.

A common compromise is to begin instruction with children who are ready and not push the others. This seemingly simple solution is difficult if not impossible to carry out in practice. First, the decision as to which kindergarten children are prepared is a complex one. Many children who can indeed begin reading are unable to complete the traditional workbook and skill sheet assignments that are part and parcel of most beginning programs. They often have six-year-old brains but five-year-old attention spans. Second, once parents realize that their child is not in a reading group, they exert tremendous pressure on teachers to begin instruction

prematurely. Third, carrying out reading instruction with children who are ready leaves teachers little time and energy for planning and conducting crucial readiness activities for the other students.

A more appropriate question than, "Should reading be taught in kindergarten?" is, "How should reading be taught in kindergarten?" A whole body of research under the umbrella term, emergent literacy, shows that children who come from homes in which reading and writing are promoted and valued begin reading before they come to school. In addition to being read to, these children have "pretend reading" experiences with favorite books in which they figure out how reading works, learn to track print, and grasp some important words. They also have picked up many words such as "McDonald's" and "Pepsi" from the logo print in their environment. The other distinguishing characteristic of children who come to school ready to read is that they usually have experimented with writing by copying words and inventing spellings. The research appears clear that young children whose home experiences immerse them in reading and writing become successful school readers (Teale and Sulzby 1986).

Reading should be taught in kinder-

garten in a way that closely mirrors the natural reading and writing experiences fortunate children have before entering school. In classrooms in which shared reading of big books, language experience, writing with invented spellings, and word banks are a large part of daily instruction, the decision of which children are ready and which are not does not have to be made. Children who come to school lacking readiness develop it by being immersed in reading and writing. Those who come to class ready or actually reading continue their growth as they learn large numbers of words and letter-sound associations through shared reading and writing experiences. For an excellent discussion of kindergarten activities that follow this approach and further readings on this topic, see Mason and Au (1986). □

References

- Mason, J. M., and K. H. Au. "Reading in Kindergarten." In *Reading Instruction for Today*. Glenview, Ill.: Scott Foresman, 1986.
- Teale, W., and E. Sulzby, eds. *Emergent Literacy: Writing and Reading*. Norwood, N.J.: Ablex, 1986.

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Curriculum Capsules

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Software Improves Access to Special Education Data

Special education teachers and administrators are finding computer soft-

ware programs to help them manage the cumbersome data bases characteristic of programs and services for students with handicapping conditions.

Triennial evaluation of programs that meet the requirements of Public Law 94-142 entails the effective processing of large amounts of data through well-

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