

ed States has been amazingly high given the conditions under which educators have worked. American teachers ought to be proud that we have done the most difficult and important job in the world as well as we have. But, given the deterioration documented here, quality is degenerating quickly at a time when education is becoming more essential for individuals and for nations. Future failure cannot reasonably be blamed on overworked, undervalued, dedicated teacher, nor can it be blamed on schools of education, nor even on commercial

textbook publishers. The future quality of education in this country depends *directly* on the actions taken, or not taken, by political leaders and their constituencies at the federal, state, and local level.

¹Trevor G. Howe and Jack A. Gerlovich, "National Study of the Estimated Supply and Demand of Secondary Science and Mathematics Teachers," paper presented at the High School Chemistry Teacher Conference, Columbia, Missouri, November 1981.

²From *Education Week*, March 31, 1982.

³Report of the Rand Corporation, *Beyond the Commission Reports* (Santa Moni-

ca, Calif.: The Rand Corporation, 1984).

⁴Ibid.

⁵From *Education Week*, March 31, 1982.

⁶*Profiles, College-Bound Seniors* (New York: College Entrance Examination Board, 1984), p. 100.

⁷The College Placement Council, *Final Report* (Bethlehem, Pa.: The College Placement Council, 1984).

⁸"Periscope: Passing the Tax Buck," *Newsweek*, November 21, 1983, p. 37.

⁹Ibid.

¹⁰Statements 17, 18, 19, and 20 came from the Fifth International Congress on Mathematics Education, Adelaide, Australia, August 1984.

Science

ROBERT E. YAGER AND JOHN E. PENICK

Taking New Goals for School Science Seriously

A new trend in science education is emerging. School leaders are planning science programs to include features from four general goal areas:

1. *Science for Meeting Personal Needs.* Science education should help students use science to improve their lives and cope with an increasingly technological world. Students must identify and deal with problems; they may not "solve" any. They must also learn to make decisions and take actions based on information and evidence. School science must be viewed as practical as well as intellectual. It should affect the way individuals live their lives.

2. *Science for Resolving Societal Problems.* Science education should produce informed citizens who can deal responsibly with science-related societal issues. To prepare for this, students must be introduced to issues and arguments. They must study the views of others while taking and justifying their own positions. They need to identify and involve themselves with current issues, even when using traditional content to help resolve those issues.

3. *Science for Career Awareness.* Science education should make all

students aware of the assortment of science and technology-related careers open to students with varying aptitudes and interests. This is especially true today, when one considers the many careers related to science and technology. Resource persons should be invited into the classroom, and students should study the community as they would a natural habitat.

4. *Science as Preparation for Further Study.* Students who are likely to pursue science academically, as well as professionally, must acquire appropriate academic interests, knowledge, and skills. This does not mean acceleration or college level courses. We must provide options ensuring success. Students need opportunities to study in depth, experiment, explain, and test. (Unfortunately, this is the *only* goal area considered in typical science programs.)

Science Literacy. Although national science leaders do not agree on the relative importance of these four goal areas, there is consensus that all must be included in K-12 science offerings designed to meet general education requirements. While some grade levels or courses emphasize goals in one of the areas, a total school program must be balanced to include all four

components to achieve true science literacy.

Examples of Meeting New Goals

Project Life Lab, an exemplary elementary school program in Santa Cruz, California, uses a garden as a laboratory where nutrition, environmental concerns, and science applications are emphasized. Students experience science in a way that affects their daily lives, focuses on major societal issues, and involves people in the community whose careers are associated with science and technology.

The *Human Ecology* program at Brandywine High School in Delaware focuses on problems and issues in the local community. Topics include health-related issues, such as drug abuse, teenage suicide, proper nutrition, and genetics. Students participate in a community service activity concentrating on a variety of careers and providing direct experience with community improvement.

Topics in Applied Science, a middle-school program in the Jefferson County Schools in Colorado, provides experiences with energy audits, the accuracy of advertising, personal rele-

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vance, and community service. Again, the emphasis is on meaningful content designed to affect practices involved with daily living, environmental issues, community, and career choices (Penick and Meinhard-Pellens, 1984).

School science can be more than academic preparation. These notable programs¹ represent major efforts undertaken in three goal areas rarely included in typical programs.

¹*Project Life Lab, Human Ecology, and Topics in Applied Science* were identified

in the Search for Excellence program of the National Science Teachers Association.

References

Helgeson, S. L.; Blosser, P. E.; and Howe, R. W. *The Status of Pre-College Science, Mathematics, and Social Science Education, 1955-75*. The Center for Science and Mathematics Education, Ohio State University, Columbus. Washington, D.C.: U.S. Government Printing Office, 1977, Stock No. 038-000-00362-3.

Penick, J. E., and Meinhard-Pellens, R., eds. *Focus on Excellence: Science/Technol-*

ogy/Society 1, 5. Washington, D.C.: National Science Teachers Association, 1984.

Stake, R. E., and Easley, J. *Case Studies in Science Education, Volumes I and II*. Center for Instructional Research and Curriculum Evaluation, University of Illinois at Urbana-Champaign. Washington, D.C.: U.S. Government Printing Office, 1978, Stock No. 038-000-00376-3.

Weiss, I. R. *Report of the 1977 National Survey of Science, Mathematics, and Social Studies Education*. Center for Educational Research and Evaluation, Research Triangle Park, North Carolina. Washington, D.C.: U.S. Government Printing Office, 1978, Stock No. 038-000-00364.

Social Studies

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Community Inquiry

The essence of social studies, as the name implies, is the study of society. Social studies programs, however, often ask students not to study society but merely to listen to or read the

results of studies conducted by others (especially their teachers and the authors of their texts). To revive the notion of social studies as active inquiry into social life, many schools are creating firsthand opportunities for

students to study their own communities.

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