Trends

Science

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Local Communities Affect Science Programs

Although American schools are often described as unique because of their control by local boards of education, all science programs tend to be almost identical. The National Science Foundation reports (Helgeson and others, 1977; Stake and Easley, 1978; Weiss, 1978) that:

1. The typical science taught in most elementary schools is no science at all.

2. One-third of science programs in junior high school are discipline-oriented at a given grade level; that is, life, earth, or physical science are usually specified while only half use a general science sequence. Only a third of the schools offer a required three-year program.

3. In nearly all high schools biology is a low-level elective for noncollege students, followed by chemistry and physics for college preparatory students, and, in nearly a third of the schools, a senior seminar, research project, and advanced biology for the science-prone.

4. Science courses across grade levels demonstrate only about 10 percent variation, even though there are several text series available and full local control as to what might be included. We have a national science curriculum.

This need not be. The Curriculum Task Force advising the special Commission of the National Science Board suggested science in K-6 with local relevance and a concern for the unique local resources and needs of students in a given community. Consumer science, health, environment, transportation, communication, and nutrition were prominently recommended subjects. The Task Force focused on a required Science/Technology/Society (STS) sequence at 9th and 10th grades, with follow-up electives for general students in 11th and 12th grades.

The Task Force recommended that science programs focus on basic science as a unifying feature through the grades. George Gaylord Simpson (Brandwein, 1981) defines science broadly with implications for teaching.

> Science is an exploration of the material universe in order to seek orderly explanations (generalizable knowledge) of objects and events: but these explanations must be testable.

By definition, the vehicles chosen to experience real world science would be unique to a given locality since the real world for students is their own community. Geography, community, people, and local issues would affect the nature of the programs as students explore, explain, and test their own explanations in their own community. Many STS exemplars identified by the NSTA Search for Excellence (Penick and Meinhard-Pellens, 1984), the National STS Network (Jarcho, 1984), and the new S-STS project (Roy, 1984) illustrate this trend toward local uniqueness of school science.

Bringing Science Home

Marshalltown, Iowa, like any city in America, has many retired senior citizens. But in Marshalltown these retirees are actively producing materials in classroom quantities at a reduced cost. Helping with bulletin boards, preparing for the first day of class, acting as lab assistants, and designing artwork to enhance curriculum units, these retired citizens, many of whom are former teachers, provide a valuable resource that would not be otherwise available.

Brevard County, Florida, home of the Kennedy Space Center, has a high concentration of technological businesses. Students from county junior and senior high schools work closely with research scientists and engineers in these community enterprises. As business leaders come to know students, they feel more comfortable working with them in the schools, allowing students to use the equipment at the industrial site and loaning equipment to schools. Many students find summer and after school employment in these local businesses.

Parents in Mansfield, Illinois, and Boyboro, South Carolina, are actively involved in classrooms, field trips, and community endeavors supporting schools. These parents are finding their assistance is not only wanted but needed to ensure the high quality academic program these schools and communities desire.

Many communities have access to amusement parks, but few use them for educational purposes. Students from Imperial, Missouri, and the Iowa Junior Academy of Science have eagerly participated in science curriculums designed around amusement parks. Studying the physics of park activities involves considerable planning, mathematics, and decision making. These

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students will no longer view such parks as mere amusement.

Almost all communities have scientists, engineers, or technicians available as human resources for their classrooms. In Iowa City, Iowa, research scientists are presenting ethical, moral, and technological issues related to science as part of a monthly seminar series for teachers. Many teachers are realizing that these same discussions can be carried out in their classrooms.

In Jamestown, Rhode Island, 7th graders study classical concepts of ecology in science and, in social studies, analyze their community socially, economically, and geographically. A significant portion of the course engages students in comparing their outdoor ecology study with their study of the community. By drawing parallels and relationships, students learn that their community functions much like a national environment. During the 8th grade, each student teaches a short unit on ecology to students in lower grades. Here students can move beyond their own classrooms into a different role in their community.

In other locations, students are becoming involved in actual decision-making and governmental bodies. For instance, in Casper, Wyoming, and Imperial, Missouri, students have made presentations before senate subcommittees, city councils, and school boards, and have testified in court. These students know firsthand how science extends throughout their environment.

Benefits of Community Involvement

Students in these programs grow up as part of the community and feel strongly that they have decision-making power and influence over their environment. In the process, they are working with people in all facets of the science field. What better way to understand career alternatives than to work shoulder to shoulder with people in the field. Working with adults, students improve their own ability to communicate, understand, and relate. Everyone profits when students and adults work closer together.

One benefit of this local involvement is a movement away from the de facto national science curriculum. Since each community is unique, widespread community involvement in the science curriculum will, by necessity, produce an indelible stamp of that community on the school curriculum, the students, and teachers. Such a stamp does much to increase a community's pride in its schools, the school's pride in its community, and students' feelings of belonging and self-esteem.□

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Reading

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Developing Inferential Comprehension

Reading is an inferential process. We make inferences constantly as we read, by combining prior knowledge with information from the page. If we read that the cowboy rode off into the sunset, we know immediately that he is going west. This inference is made by combining a piece of information from the text—into the sunset—with a piece of information from our prior knowledge store—the sun sets in the west. Imagine that you read that Mercury is the smallest planet; in another part of the text you read that Pluto probably is the size of Mercury. From

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