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Transition to Technology Education: A Major Shift in the Secondary Curriculum

In Bernardsville, New Jersey, technology education is moving out of vocational education classes into the general education curriculum, away from projects and into problem solving.

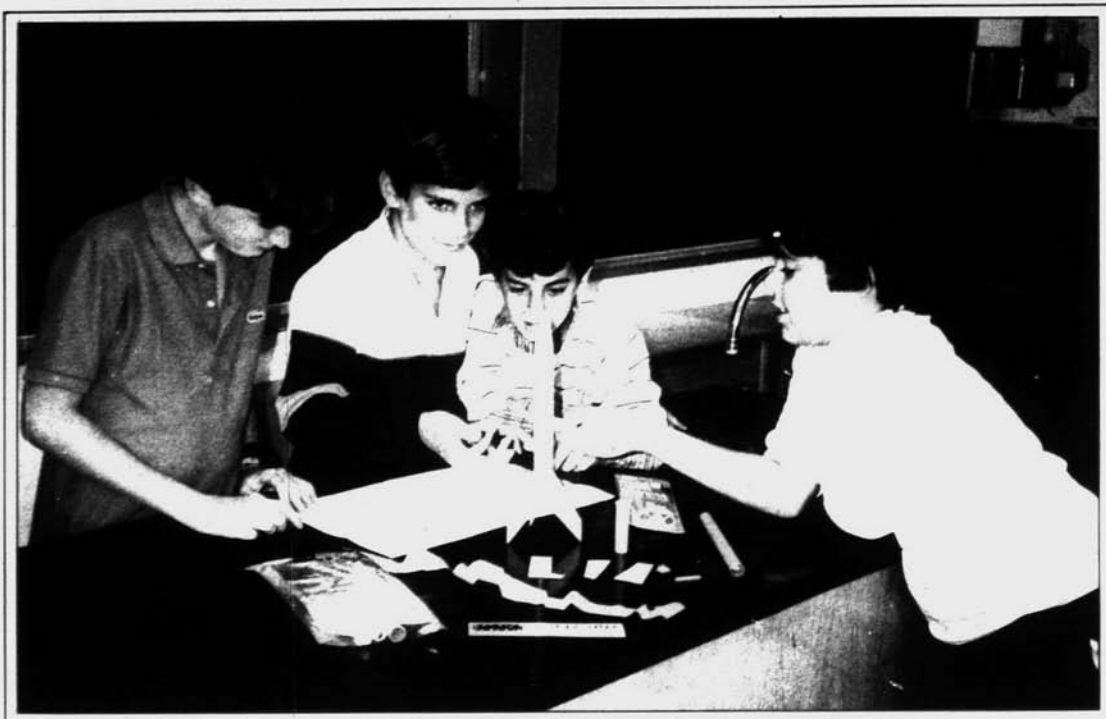
During the past several years, at least four highly respected national reports[1] have recommended key shifts in the traditional high school curriculum, particularly in the areas referred to as industrial arts, vocational education, or practical and applied arts. The thrust of these recommendations is that both the academic and vocational or job-preparatory aspects of the curriculum need to be strengthened and vocational courses enriched and diversified to make them attractive to *all* students.

In harmony with the national reports, many states have been reviewing and revising their industrial arts curriculums. In New Jersey, the Commission on Industrial Arts Education concluded that "the traditional industrial arts program no longer fulfills the needs of students in the latter part of the twentieth century. . . . A new direction is clearly required. That new direction may be technology education."[2] In broad terms, technology education requires a shift from the specific, project-oriented content of the past to a more universal and process-oriented approach. It also requires up-to-date equipment; the integration of computers into the courses; and a continuous interaction between the knowledge base and the political,



Technology education seeks to develop in all students an understanding of technological processes and products, such as the process of constructing a robotic arm in this Robotics Design and Application course.

Photographs by Ken Lundy



Students launch their study of technology in an aerodynamic design project, using problem-solving techniques to design and test their own rocket system.

social, and technical components of our environment. Its major goal is to provide instruction for lifelong learning, decision making, and adapting to change. Technology education, according to the New Jersey report, seeks to "develop in all students an understanding and appreciation of technological processes and products, and the impact these developments have on our lives." The technology education curriculum is designed to be action based and to provide students with the opportunity to "apply creative problem-solving techniques for the solution of technical problems."

Revamping Industrial Arts

In light of this seemingly incontrovertible imperative for change, how could the small Bernardsville, New Jersey, school district begin to undertake the mammoth task of revamping its industrial arts curriculum? We began by enumerating a set of general needs:

1. to provide a program for *all* students—those interested in various vocations; college-bound technically and nontechnically oriented students; or simply those who wished to increase their skills, competencies, and problem-solving abilities;
2. to close the gap between what is taking place in industry and what is being taught in our schools;
3. to phase out the project-oriented curriculum and move toward more creativity and problem-solving techniques;
4. to improve the attractiveness of the course offerings to appeal to a broader range of students;
5. to provide greater choices among elective courses in light of the increased number of credits (120) required for graduation;
6. to integrate the courses more fully into the total school curriculum and to show students how various subjects and skills relate to one another; and
7. to provide more inservice training opportunities for staff members.

Since the members of the industrial and related arts department were the ones who perceived these needs, they clearly had a vested interest in meeting them. Under the direction of the department chair, they eagerly set about redesigning courses in their individual areas of expertise. This "grass-roots" collaborative effort ensured both the knowledge base and staff support needed for the entire endeavor.

A New Curriculum

Bernard High School, which comprises grades 7–12, offers the ideal setting for a totally articulated technology education program. The new sequence, to become effective in September 1987, will replace the traditional industrial arts program, which typically offers a seventh and eighth grade exploratory cycle (construction, foods, clothing, and design) followed by high school level courses in cooking, sewing, woodworking, mechanical drawing, and electricity.

The new curriculum will offer introduction to technology at the junior high level. This survey course will give students an overall background in design, manufacture, and repair; orient them toward technological concepts; and develop their technical problem-

solving skills, career awareness, and work habits. It will expose students to a range of skills and materials from which they can progress into areas of personal interest and ability. Subsequent courses, such as drafting design; engineering, architectural, and computer-assisted drafting; electronics; robotics; introduction to cabinetmaking and manufacturing; photography; and electrical wiring fundamentals will continue to develop and apply students' technical and problem-solving skills. Some courses will prepare students to pursue engineering and scientific education in colleges or universities. Other courses will lay the foundation for students' subsequent career preparation at the secondary or postsecondary levels. Still other courses will expose students to lifelong leisure and creative outlets. Several home economics courses also have been redesigned to reflect changing technologies and shifts in patterns of work, leisure, and family life.

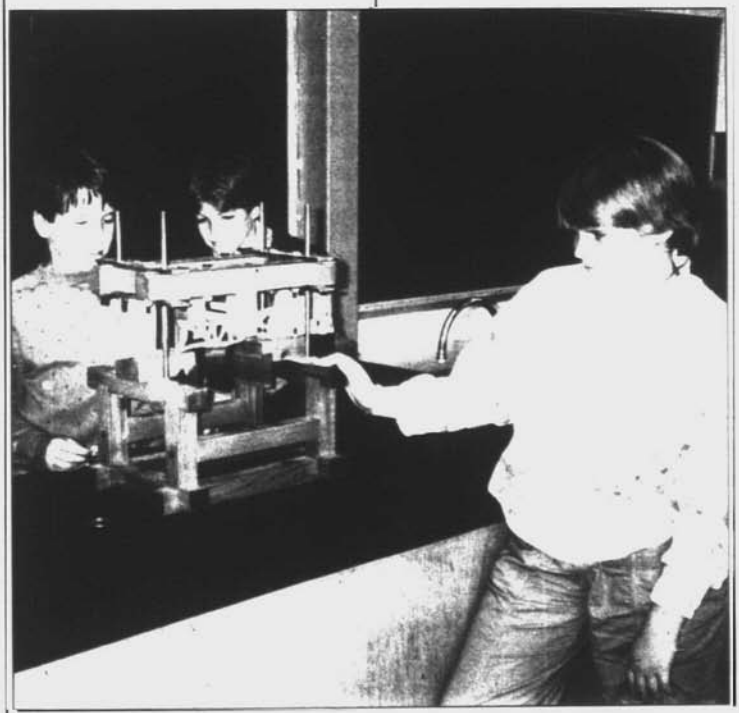


The new curriculum applies concepts from science, mathematics, humanities, and the arts to current technology.

Students will be better prepared to make intelligent, informed decisions as consumers and controllers of technology. Skills relating to fashion and home design, merchandising, advertising, child growth and development, and career planning will be enhanced through an experiential approach.

In all courses, the emphasis is on developing transferable skills and understandings so that students who will spend the major portion of their lives in the twenty-first century will be able to apply their knowledge to rapidly changing situations. Within this new curriculum, concepts of science, mathematics, humanities, and the arts will come together as they are applied to current technology. Wherever necessary or desirable, teachers will have the opportunity to update their skills and enhance their knowledge through workshops, conferences, and graduate work.

As our small, predominantly academic school district ventures into new territory, we are demonstrating a sound approach to curriculum revision: capitalizing on faculty expertise to address local student and staff needs in accord with national and state recommendations.□



Just as these seventh and eighth graders are learning to design and support structures, so too is the expertise of individual faculty members supporting a revised curriculum.

1. E. L. Boyer, *High School: A Report on Secondary Education in America* (New York: Harper & Row, 1983); Task Force on Education for Economic Growth, *Action for Excellence: A Comprehensive Plan to Improve Our Nation's Schools* (Denver: Education Commission of the States, 1983); Commission on Precollege Education in Mathematics, Science, and Technology, *Educating Americans for the 21st Century* (Washington, D.C.: National Science Board, 1983); and the National Commission on Secondary Vocational Education, *The Unfinished Agenda: The Role of Vocational Education in the High School* (Columbus: National Center for Research in Vocational Education, Ohio State University, 1984).

2. *Report of the Commission on Industrial Arts Education in Transition: The Emergence of Technology Education* (Trenton: New Jersey Department of Education, 1985).

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