

**TECHNOLOGICAL
STUDIES:
*AN IMPERATIVE
FOR VIRGINIA***

VIRGINIA

TECHNOLOGY EDUCATION ASSOCIATION

TECHNOLOGICAL STUDIES: AN IMPERATIVE FOR VIRGINIA

From the use of hieroglyphics in the Stone Age to the development of the Internet during the current information age, technology has characterized the human experience and the advance of civilization. People have used technology as their principle means to create, modify, and understand their world around them in order to satisfy their needs and wants.

Today, technology has become so complicated and widespread that few people truly have a clear understanding of it. Whether or not individuals realize it, everyone is involved in the creation, use, and control of technology. As a result, Virginians have increasing reasons — and a critical need — to have a coherent understanding of technology.

WHAT IS TECHNOLOGY?

Technology, human innovation in action, is the principle means by which systems are developed to solve problems and extend capabilities. Technology is more than physical products such as, the computer; rather, technology encompasses:

- *Processes* - human activities, including creating, inventing, drawing, designing, developing, utilizing, and assessing;
- *Knowledge* - the nature and history of technology; technological concepts and principles; and the relationships with other disciplines, society, and the environment; and
- *Contexts* - large organizational systems of technology.

(Technology for All Americans Project, 1997).

WHAT IS TECHNOLOGICAL STUDIES?

Technological studies provides the opportunity for students to learn about the knowledge and processes related to technology that are needed to solve problems and extend human capabilities and to develop technological literacy.

Technological literacy for all Virginians means each person has knowledge and understanding of:

- Creating technological devices, means, and systems;
- Utilizing technological means to achieve a goal;

- Understanding the interaction of technological systems; and
- Realizing the impacts of technology upon people, society, and the environment.

To achieve technological literacy, technological studies must be a continuous long-term effort in a student's education from grades K-12.

Technological literacy cannot be accomplished through ad hoc

approaches to education, but must be delivered through a well-planned and designed experiential program.

In technological studies, learning is brought to life through concrete, hands-on learning experiences in laboratory environments. This type of learning bridges the gap between the seemingly artificial setting of the school and the realities of everyday life. Technological studies gives all students, regardless of ability level, the opportunity to research, experiment, invent, and solve practical problems through the control and application of technology. Students work in group settings to search for better ways to implement technology and assess its impact on themselves and society. This activity-based and problem-solving learning develops teamwork and critical thinking skills.

Technological studies should not be confused with "educational technology," which is the use of computers and audiovisual equipment for the enhancement of teaching and learning.

Technological studies is a school subject requiring continuous long-term effort, from K-12.

ESSENTIAL NEED

Growth in technology, its applications in industry and society, and the changing nature of the workforce makes it imperative for all Virginians to be technologically literate and confident. No matter what a person's occupation - whether it be a newspaper reporter, homemaker, engineer, salesperson, or architect, he or she will be faced with a variety of technological decisions each day. To prosper in this environment, they must be equipped with the skills to maintain control over their daily life and to make responsible decisions in a democracy influenced by technology. Technological studies must be a major partner in meeting the essential needs of citizens and in securing the economic prosperity of Virginia.

Technological literacy is the ability to use, manage, and understand technology.

TECHNOLOGICAL STUDIES IN ELEMENTARY SCHOOL

Technology should be integrated throughout the elementary curriculum. At this level, students learn about the fundamentals of technology and how it relates to their family and neighborhoods. Through drawing, planning, designing, problem solving, building, and testing, students become involved in the kind of active learning that they need *and* enjoy. These experiences enable them to apply their

technological knowledge to real life experiences and to develop critical thinking skills.

TECHNOLOGICAL STUDIES IN MIDDLE SCHOOL

Throughout middle school, students will continue to develop an understanding of the breadth of technology in their society. They will study technology from a systems perspective through the application of resources to create processes to solve a problem or meet a need. Students will simulate, model, or sometimes create real technological solutions. They will learn to rely on principles of engineering, design, problem solving, and knowledge to synthesize a technological understanding. Studying the breadth of technology allows the early adolescent to begin

Technological studies teaches teamwork, problem solving, design, and communication.

forming ideas about work, careers, and consumerism. Middle school students will have experiences in units of study like Inventions

and Innovations and Technological Systems.

TECHNOLOGICAL STUDIES IN HIGH SCHOOL

During high school, students in technological studies should develop the capacity to make responsible judgements about technology's use.

Curriculum options should allow individual students

to extend their technological knowledge in specific processes and technological courses, such as Technology Transfer, Introduction to Engineering, or Technology Assessment.

CURRICULUM INTEGRATION

Technological studies promotes an interdisciplinary learning environment. It enriches all aspects of a student's educational experience - from science to the humanities. It helps students to understand and apply concepts learned in mathematics and principles studied in science, as well as communication skills developed in humanities with concepts and principles of technology. The results are students who are able to address the important question of "Why do I need to learn this?"

Technological studies brings abstract ideas to life through concrete, hands-on experiences.

Technology is inherently linked to mathematics and science and is viewed as essential in preparing the engineers, architects, and scientists of the future. "It

is the union of science, mathematics, and technology that forms the scientific endeavor and that makes it so successful. Although each of these human enterprises has a character and history of its own, each is dependent on and reinforces the others," stated the American Association for the Advancement of Science (Rutherford, 1990, p.1) in its Benchmarks for Science Literacy. Of course, language arts is vitally linked to all of these.

COMMITMENT AND RESPONSIBILITY TO A MISSION

All citizens of the Commonwealth have a responsibility for improving our - and our future generation's - quality of life and Virginia's economic prosperity. To achieve this, it is imperative that every Virginian have the opportunity to gain a technology education that will help prepare them to be a successful and productive citizen. The rapidly changing nature of the workplace, industry and commerce, and technological innovation mandates implementing a specific plan in which all Virginia students receive a quality education.

A united effort is required to ensure that all students receive a technology education.

To achieve this goal of technological studies for all Virginia students, a commitment is needed from industry leaders, governmental decision-makers, and educators. Leaders in industry have a firsthand stake in the preparation of the future workforce. Politicians and government officials through service to their constituents must formally expand the role of technological studies. Educators should also apply their expertise in implementing this initiative.

Each of these groups of Virginians must unite around the goal that technological studies must become a part of every student's education. Comprehensive programs from preschool through adulthood must provide

instruction that ensures all students have the opportunity to achieve technological literacy and focus on life long learning.

This effort must be sustained over a period of years through the united effort of individuals from many sectors of our society. Funding, consultation, advocacy, and curriculum development require a concerted effort for a difference to be made. Our citizens of the Commonwealth deserve no less. Our students deserve much more.

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TECHNOLOGY EDUCATION ASSOCIATION

Virginia Technology Education Association (VTEA), a nonprofit organization, is Virginia's leading advocate in educating citizens to be technologically literate. VTEA envisions a citizenry which is technologically literate, where each person is prepared to function effectively in and contribute to a technological society and global economy.

VTEA serves and represents more than one thousand Virginia teachers. The association sponsors regional staff development programs, publishes a quarterly newsletter, and conducts an annual statewide technology teachers conference for the purpose of advancing technological studies in Virginia.

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