

INTERNATIONAL  
TECHNOLOGY  
EDUCATION  
ASSOCIATION

# TECHNOLOGY FOR ALL AMERICANS

A PROJECT OF THE  
INTERNATIONAL TECHNOLOGY EDUCATION ASSOCIATION  
TO DEVELOP STANDARDS FOR K-12 TECHNOLOGY EDUCATION

May 1997

Funded by NASA and NSF

## *Letter from the Director*

### A Call For Action: What Everyone Can Do

Americans never tire of telling themselves that they have created a technological society. We even seem to be delighted about this and many believe that the pathway to improved life is through continuous technological innovation. Whether this is true or not is debatable, but I think we can all agree that technological literacy is as important as cultural literacy in our modern world. Without a good grounding in the study of technology, we will become technopeasants in the new millennium of the 21st century. If this is so, then why isn't every child in American school systems given a solid basis in technology education from kindergarten through the twelfth grade? Why are we allowing such an important and vital component of education to be left to an ad hoc approach which children may get in the classroom, but often are left to glean for themselves?

There is a vital need to inform others about the importance of the study of technology in our schools. School officials, teachers, community members, and parents should all be aware of what technology education is and what it means to be technologically literate. They need to learn that what we are talking about is much more than just learning computers or teaching with technology. And, lastly, each one of them needs to become an advocate for technology education in their own community so more and more school systems begin to include technology education as part of their core curriculum.

But how do we inform others about the importance of the study of technology in our schools? What resources are available to each of us to spread the word about the need for technology education for everyone? How can we inform others that we must not confuse the study of technology (technology education) with the teaching of how to use technology (educational technology) exclusively? In a nutshell, where do we begin?

Each of us has a vested interest in the success of technology education, as citizens and as professionals. We are the ones best equipped to inform others and we should be the leaders in spreading the word about technology education and technology education standards to those we come in contact with. There are many resources available that we can use to educate ourselves for this task. One of the richest resources for the promotion of the study of technology is a new document which the Technology for All Americans Project has recently produced called *Technology for All Americans: A Rationale and Structure for the Study of Technology*. It is currently available for purchase through the International Technology Education Association (ITEA).

In addition to the *Rationale and Structure*, the Technology for All Americans Project homepage is available for anyone to look at and gain more information. The URL is: <http://scholar.lib.vt.edu/TAA/TAA.html>. Also, ITEA has a number of publications and videos available for purchase that deal with technology education. *The Technology Teacher* and *Technology and Children* are two of the current journals printed throughout the school year. In cooperation with Thompson Learning Tools, ITEA recently produced a video titled, "Technology Education — A New Paradigm." Using a selection of powerful images shot at schools across the country, the video provides an excellent overview of the study of technology and the need for Standards for Technology Education.

We all need to promote technology education as a crucial core subject in schools. The critical message to be told to others is that the study of technology is important to everyone. It is as vital to a "liberal education" as knowing how to read, to write, or to calculate. The message is clear, now is the time to deliver it.

William E. Dugger, Jr.

# Organizational Structure for the Standards for Technology Education

One important aspect of any complex and comprehensive development effort has to do with structure and organization. The Technology for All Americans Project is no exception. The challenges associated with defining and organizing the content of technology are extremely difficult given the complex and dynamic nature of the concept. The following paragraphs are designed to provide a brief overview of the organizational structure that is being used by the Standards Team to accomplish this process.

The foundational structure for the standards has been provided in the document *Technology for All Americans: A Rationale and Structure for the Study of Technology* which was developed during Phase I of the project. In that document, a conceptual framework, based on three Universals, is presented and described. These Universals include Processes, Knowledge, and Contexts (see Figure 1). These Universals represent the largest conceptual

components in the structure and are designed to be inclusive of the study of technology.

Dimensions of Technology represent the next level of detail. The Processes Universal contains four Dimensions while the Knowledge and Context Universals both contain three Dimensions (see Figure 1). Taken collectively, the Universals and Dimensions represent the conceptual foundation and framework presented in the *Rationale and Structure*.

The work of the Phase II Standards Team is to build on this foundation by refining and detailing the Universals and Dimensions into content standards for the grades K-2, 3-5, 6-8, and 9-12. Writing the standards consists of an overarching set of principles that underlie the vision of technological literacy. The Team has developed an outline to guide the writing of the standards that reflect the thinking of the *Rationale and Structure*.

The outline of the standards aids in building a language that describes what every person is expected to know and do in technology. The context of technology involves the many practical reasons why technology is developed, applied, and studied. Those three contexts -- Physical Systems, Information Systems, and Biological/Chemical Systems -- are therefore being used as the settings of the Content Standards. Physical systems are those that are tangible and made of physical resources and/or transport people and things. Informational Systems are concerned with processing, storing, and using data. Such systems provide the foundation for today's "information age." Finally,

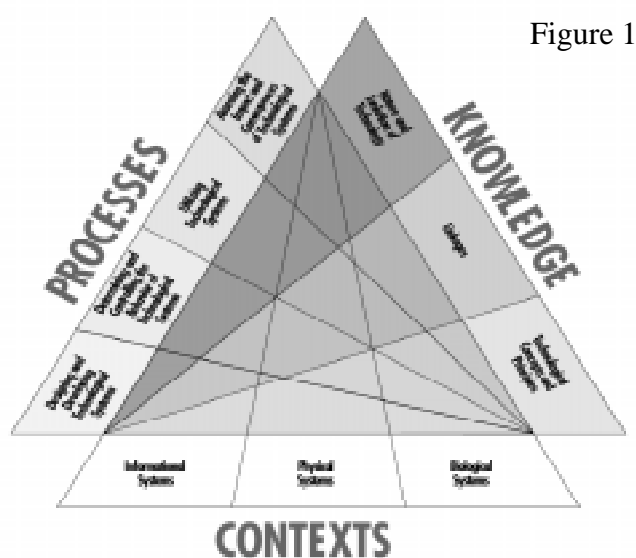


Figure 1

The *Technology for All Americans Project* (TAA) is a project of the International Technology Education Association (ITEA) and funded by the National Science Foundation (NSF) and the National Aeronautics and Space Administration (NASA). All inquiries should be addressed to:



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Biological/Chemical Systems are being used in such fields as agriculture, medicine, sports, and genetics to make or modify products, to improve humans, plants, and animals, and to develop micro/macro systems for specific use.

Built into the development of the standards are three points checking the progress students are making in technological literacy at the twelfth grade and at the end of the second, fifth, and eighth grade. Each standard will state, as the result of all activities leading up to and including the grade level discussed, the content that is recommended to be understood or developed.

Under the Universal of *Processes* and the Dimension of *Designing and Developing Technological Systems* a standard may look like the following:

1.1 In designing and developing, at the twelfth grade level, the technologically literate student in a physical, informational, or biological/chemical setting is able

- to identify the need or purpose of a design.
- to engage in ideation to develop the design.
- to select and clarify the criteria necessary to complete the design.
- to choose appropriate design media.
- to choose the appropriate design tools/machines to help develop the design.

The first draft of the Standards for Technology Education will be ready to view during the consensus workshops starting in October 1997.

By: Dr. Rodney Custer  
*Standards Team Leader: Grades 9-12*

## New Staff for Phase II

**T**echnology for All Americans Project hired four new staff members for Phase II of the project, including filling two new positions. The new members join **Dr. William Dugger, Jr.**, Director, and **Jodie Altice**, Administrative Assistant, in helping to create and establish Standards for Technology Education.

**Pamela "Pam" Brooks Newberry**, a 1996 Albert Einstein Distinguished Educator Fellow, is the project's senior research associate. She is responsible for researching and contributing to the development and promotion of the Standards for Technology Education. For nine years, Pam taught technology and mathematics education. She has won several awards, including being named the 1994 William C. Lowery Virginia Teacher of the Year and receiving the 1993 Presidential Award for excellence in teaching Mathematics and Science.

**Kenneth Singletary** and **Amy Kinser** have been hired for the new positions of research assistant and public relations/dissemination assistant, respectively. Ken, whose duties include researching and writing project assignments, is a former newspaper reporter, university instructor, and graduate student. Amy Kinser is working part time as the PR/dissemination assistant and is responsible for coordinating project communication activities. Also newly hired is **Diane Kitts**, the project's secretary.

## The Standards Team Leaders

### Grades K-2 and 3-5:

**Jane Wheeler** is the Principal of Monte Vista Elementary School in Rohnert Park, California.

### Grades 6-8:

**Dr. Franzie Loepp** is Distinguished Professor at Illinois State University and a co-director for the Center for Mathematics, Science and Technology.

### Grades 9-12:

**Dr. Rodney Custer** is the program leader of technology and industry education program and Associate Professor at the University of Missouri-Columbia.

Visit ITEA on the Internet at their  
new address:

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*Please contact us with any corrections to your name  
and/or address. Thank you.*

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**See Next Newsletter for More Information  
on Consensus Workshops:  
Due Out August, 1997**

## The Standards Team

The role of the Standards Team is to propose, evaluate, and approve the content of the standards. Representatives from technology, mathematics, and science education, as well as engineering, make up the team.

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*University of Missouri-*  
*Columbia*

\* *Leader*  
\*\* *Recorder*

## The Advisory Group

The Advisory Group will recommend the best practices in standards development and determine ways for the study of technology to be integrated within the total school curriculum.

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*National Research Council*  
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