

Title: **National Standards on Technology Education Released.**

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Source: [Education Week](#); 04/12/2000, Vol. 19 Issue 31, p18, 2/3p

Document Type: Article

Subject Terms: *[TECHNOLOGY -- Study & teaching](#)
*[STANDARDS](#)

Geographic Terms: [UNITED States](#)

Company/Entity: [INTERNATIONAL Technology Education Association](#)

Abstract: Deals with the *standards* for *technology education* in the United States released by the International *Technology Education* Association (ITEA). Purpose of the *standards* according to Steve Mikulski, a member of ITEA; Topics covered by the *standards*; Role of the National Science Foundation and the National Aeronautics and Space Administration in financing the creation of the *standards*; Criticisms on the *standards*. INSET: Understanding *Technology's* Impact.


Full Text Word Count: 1323

ISSN: 0277-4232

Accession Number: 3173140

Persistent link to this record: <http://search.epnet.com/login.aspx?direct=true&db=aph&an=3173140>

Database: Academic Search Premier

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National Standards on Technology Education Released

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Building towers out of toothpicks and glue, and then destroying them, might not sound like an assignment that belongs in a "*technology*" class.

But that's what Steve Mikulski, a *technology* teacher at Roberto W. Clemente Middle School in Germantown, Md., is asking his 6th graders to do.

"We're going to put them in this machine and smash them," Mr. Mikulski said, pointing to the school's \$5,000 structural-stress analyzer.

He challenges the students to a contest in which they will try to construct the most "efficient" tower, light yet sturdy. The machine--after applying pressure on each tower until it breaks--will churn out a digital reading analyzing its strength.

It's activities like these--which spur children to use their hands and minds together to solve problems--that schools should embrace more often, according to the Reston, Va.-based International *Technology Education* Association. Last week, the group released the first national *standards* for *technology education*.

Technology education, at least in name, has been replacing industrial arts courses in middle and high schools since the mid-1980s. Mr. Mikulski, a member of the ITEA, believes the new **standards** will help speed the transition.

"It's going to put everybody on the same page, doing the same activities," he said. "That isn't happening now."

But the organization also hopes the **standards** will encourage educators in all subjects to think about **technology** as a subject worth teaching in itself.

"It's a new subject--**technology**--that we're striving for in the **standards**," said William E. Dugger Jr., a professor emeritus of **technology education** at Virginia Polytechnic Institute and State University in Blacksburg, Va., who directed the five-year **standards** project for the ITEA.

When Mr. Dugger uses the word "**technology**," he doesn't just mean computers. He's talking about virtually everything made by humans--from airplanes to artificial fabrics to medicine.

"**Technology** wakes us up in the morning, gets us to our workplace and school, provides food for us, and helps us to live better and longer," Mr. Dugger said. People need to understand how to make decisions about **technology** based on something more than emotion or a gut-level feeling, he added.

The **standards** cover a broad range of topics, including engineering design and "the role of society in the development and use of **technology**."

The ITEA calls them "**technology** literacy **standards**," which differ from the "educational **technology standards**" published in 1998 by the Eugene, Ore.-based International Society for **Technology in Education**. The ISTE **standards** focus primarily on instructional **technology**, particularly computers.

Limited Effect?

Written with funding from the National Science Foundation and the National Aeronautics and Space Administration, the **standards** were reviewed by the National Academy of Engineering and National Research Council. The ITEA plans to urge states to infuse them throughout all the core subjects of the K-12 curriculum, not just separate **technology education** classes. But Larry Cuban, a professor of **education** at Stanford University, described that idea as "dead on arrival."

"The current frenzy for testing and accountability is so extreme that the idea of squeezing something else into the core curriculum ... is highly unlikely," said Mr. Cuban, who has written extensively about the history of curriculum and instruction in American schools.

Dennis W. Cheek, the director of information services and research for the Rhode Island Department of **Education** and a member of the review panel of the National Research Council, said full-fledged adoption would be a "very steep climb."

"The problem with **technology education** is it's not even on the radar screen," he said. "It probably has about the same status as something like music."

Daniel M. Hull, the chief executive officer of the Waco, Texas-based Center for Occupational Research and Development, is hopeful that the **standards** might be used in science and social studies classes in elementary or middle school, but he believes they are too "exploratory" to be used in high school.

"I don't think there's enough room in the curriculum," Mr. Hull said.

But at the same time, those experts said they like the **standards** and believe students could benefit from them.

"They've made a good case for the importance of the study of **technology** in and of itself in society," Mr. Cuban said.

"We live in this pervasively technological world, yet there's nothing in the school curriculum about it, and it's appalling," Mr. Cheek added.

Balance Sought

Some observers who have criticized the growing use of computers in schools applauded the ITEA **standards** and said they hoped they would be taken seriously.

William L. Rukeyser, the coordinator of the Woodland, Calif.-based nonprofit group Learning in the Real World, said the **standards** acknowledge that **technology** involves trade-offs. He has argued that schools have been too quick to replace activities that encourage hands-on learning with computer activities.

"The people who put together this report seemed to be going out of their way to be getting rid of the 'gee whiz' evangelical approach that has characterized educational **technology**," Mr. Rukeyser said. Like most of the outside experts interviewed for this story, he had not yet read the entire 248-page **standards** document, but was provided with an introduction and overview. Jane M. Healy, the author of the 1999 book Failure To Connect: How Computers Affect Our Children's Minds: For Better and Worse, called the **standards** "a splendid idea." She opposes the use of computers in schools before the end of the 2nd grade but said, "I've been suggesting in my lectures that we start talking with students very early about the place of **technology** in the culture and its relationship to human behavior."

Douglas M. Sloan, a professor of history and **education** at Teachers College, Columbia University, said the **standards** didn't seem to be critical enough of **technology**. He is a member of the Alliance for Childhood, a group of 45 educators, doctors, and children's advocates formed last year who oppose the use of computers in the early grades.

Mr. Sloan said the chapter that spells out the need for the **standards** "reads like an indoctrination of a child into a technological world."

Mr. Dugger responded that, in the document as a whole, "we feel there's a good balance between the good side of **technology** and the dark side." He added that he wants students to be "objective about its use and neither scared of it or infatuated with it."

FOLLOW-UP: Copies of the **standards** are available for \$30 by calling the International **Technology Education** Association at (703) 860-2100. They are scheduled to be posted online by the end of this month at www.iteawww.org.

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By Mary Ann Zehr

### Understanding *Technology's* Impact

The following is a sample standard in the "**technology** and society" category of the new

national "**Standards** for Technological Literacy," released by the International

**Technology Education** Association:

Students will develop an understanding of the cultural, social, economic, and political

effects of **technology**. Students should learn that...

#### Grades K-2:

- The use of tools and machines can be helpful or harmful.

#### Grades 3-5:

- When using **technology**, results can be good or bad.

- The use of **technology** can have unintended consequences.

### Grades 6-8:

- The use of **technology** affects humans in various ways, including their safety, comfort, choices, and attitudes about **technology's** development and use.
- **Technology**, by itself, is neither good nor bad, but decisions about the use of products and systems can result in desirable or undesirable consequences.
- The development and use of **technology** poses ethical issues. Economic, political, and cultural issues are influenced by the development and use of **technology**.

### Grades 9-12:

- Changes caused by the use of **technology** can range from gradual to rapid and from subtle to obvious.
- Making decisions about the use of **technology** involves weighing the trade-offs between the positive and negative effects.
- Ethical considerations are important in the development, selection, and use of **technologies**.
- The transfer of a **technology** from one society to another can cause cultural, social, economic, and political changes affecting both societies to varying degrees.

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**Source:** Education Week, 04/12/2000, Vol. 19 Issue 31, p18, 1p

**Item:** 3173140