

Technology Education in the U.S.: A Status Report

There are major movements being made at the local level for establishing technology education as an important subject in pre-college programs.

With reform movements of the last 20 years, many subjects have been impacted by the need to meet standards. Many states have moved to mandate a core set of subjects, such as mathematics, science, history, and reading that all students are required to take and also require students to pass achievement tests at different grade levels. This movement's purpose is to demonstrate that schools are adequately preparing their students for their future endeavors. Many elective subjects have been impacted greatly because of this movement. You may ask, what do the educators in technology education report about their field?

A survey was conducted in order to determine the status of technology education in the U.S. This survey provides data that are vital to understanding how technology education is increasing in importance in our public schools. This data will help us to better understand how technology education is being affected by the increased academic

requirements. Ongoing research such as this provides us with an opportunity to identify new trends as well as longevity patterns. The research was conducted by the International Technology Education Association's Technology for All Americans Project (ITEA-TfAAP) in cooperation with the ITEA Council for State Supervisors for the 2000–2001 school year.

by Pamela B. Newberry

The survey instrument used for this study was sent to all state supervisors in the U.S. and as well as territorial supervisors of technology education. In the states where a supervisor for technology education is not available, other contacts were made, such as the state technology education association's president or collegiate representative. The survey included three questions: (1) Is technology education in your state framework? (2) Is technology education required in your state, and

if so, at what grade levels? (3) How many technology education teachers are in your state? In addition, the number of teacher educator programs was identified and included in the data. This data was compiled from *Industrial Teacher Education Directory (ITED)*, 2000-01, 39th edition.

Who Responded?

Each U.S. state was contacted as well as the District of Columbia and Puerto Rico. As of the 5th of April 2001, the District of Columbia, Puerto Rico, and 47 out of 50 states have responded. There was no response from Montana, Rhode Island, or Vermont, and data is missing in responses from the District of Columbia, Hawaii, Maryland, Oregon, and Puerto Rico (See Table 1). During the time of the survey, four states either had state supervisors change positions or they retired.

Technology Education in the State Frameworks?

The first question asked in the questionnaire was "Is technology education in your state framework?" (See Table 1) A surprising number of those surveyed, 30 (57.7%), reported that technology education is in the state framework of education. This framework typically reports the subject matter which states believe to

be important for students to experience in order to have a well-rounded education. In addition, of those surveyed, 18 (34.6%) reported that technology education was not in their state framework, with 12 of those respondents providing additional clarifications to the response being recorded as “No.”

From the 49 responses received, many provided additional insights to the status of technology education in their respective states. Five respondents (10.2%) acknowledged that their states placed technology education in the vocational or tech prep frameworks of the state. Respondents from 11 states (22.4%) reported significant movement toward incorporating technology education more fully in the state curriculum frameworks. Alabama is currently integrating technology education into the science course of study and it will be part of the Career/Technical course of study. Arizona is currently working on a curriculum-integrated project that will enhance the placement of technology education with other subjects. Technology education and educational technology in Colorado are combined, and they are coordinated with the Colorado K-12 Content Standards and *Standards for Technological Literacy: Content for the Study of Technology (STL)* (ITEA, 2000). The Colorado Department of Education has placed full information regarding their standards on the Internet (see http://www.cde.state.co.us/cdetech/et_stand.htm). Though Idaho currently shows technology education as a vocational subject, the state has adopted *STL*, and some districts

are working to incorporate technology education more fully into the public schools. Louisiana is making plans to work during the summer of 2001 on state standards and to revise their local curriculum to reflect the standards and *STL*. Missouri is currently conducting a study on the student population and tactile learning. It is hoped that the results of this study will help to increase the awareness and need for technology education for all students. Technology education in Nebraska is not currently in the state framework; however, the traditional clusters (i.e., construction, manufacturing, transportation, and communication) are in the framework. Nebraska hopes to revise those clusters to align more completely with *STL*. New Jersey currently lists technology education as industrial arts, next to woods and leather crafts. In 1996, the Technology Education Association of New Jersey (TEANJ) developed standards. The New Jersey Department of Education did use some of the TEANJ standards and scattered them throughout other core subject areas. The TEANJ is working to bring *STL* to New Jersey and to enlighten many in the field of education. Technology education in Ohio has a framework recognized as one of the ways students may achieve a technology experience. Currently, legislation is pending on the education of students in Ohio, and it is not clear how it will evolve and where technology education may be placed. In Oregon, technology education is in the state framework, but it is more of a placeholder and does not rise to the level of technological literacy as advo-

cated in *STL*. The state of Washington adopted *STL* as their skill standards for technology education. The state has also adapted the standards for the program standards for technology teacher education programs in Washington.

The data indicates that there is more movement towards acknowledging technology education as a means to provide more students with an opportunity to learn about technology beyond computers. With the emphasis of science and technology expressed in both *National Science Education Standards* (NRC, 1996) and Project 2061's *Benchmarks for Science Literacy* (AAAS, 1993) and the publication of *STL*, many states are forging new ground for the study of technology.

For a summary of the data to “Is technology education in the state framework?” refer to Figure 1.

Technology Education Required?

The second question in the survey, “Is technology education required in your state, and if so, at what grade levels?” provided data that showed interesting trends in the study of technology and the place of technology education in public schools. (See Table 1) Fourteen (27%) of the states reported that technology education is required (in some form) in their states. In six additional states (11.5%) where technology education is under local school district control, the requirement of technology education is left to the localities. Two states (3.8%) are waiting on pending legislation regarding the status of technology education or are in the process of writing standards to meet

Technology Education in State Frameworks

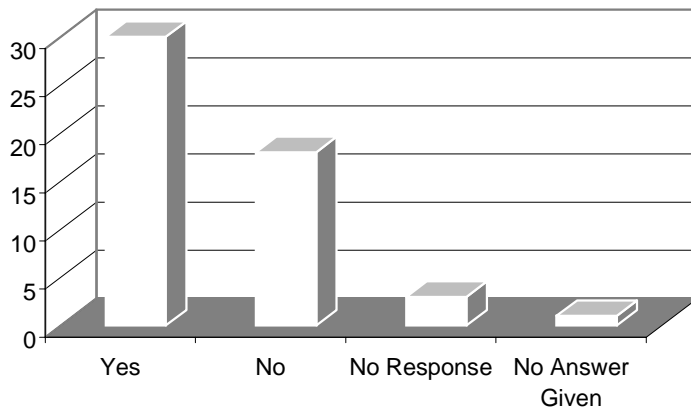


Figure 1: Summary of Responses to "Is technology education in the state framework?"

a requirement. Of the 52 states and territories sampled, 16 states (30.8%) still consider technology education an elective, while ten other states (19.2%) simply responded "No" to it being a requirement.

Of the states that responded "Yes" to the requirement of technology education, Michigan actually recommends that students take technology education. However, 95% of Michigan's districts participate in using technology education as part of their Career Preparation System, resulting in most of the school districts requiring that all students take some courses in technology education during their school career. In contrast, Massachusetts requires technology education for grades 5 and 8 as part of the Massachusetts CAS – Science/Technology Engineering Framework. Students in the 9th grade who attend a Tech Prep high school are required to take Technology Discovery, a basic course in technology

education. Of the Tech Prep high schools, 95% require the Technology Discovery course. Likewise, Colorado requires technology education at least nine weeks of a student's time during the 7th through 9th grade experience. Hawaii states that all standards are required and, since technology education falls under the Career and Life Skills of the state's curriculum frameworks, then technology education is required of all students. In February 2000, the State Board of Education in Indiana passed the following change in minimum credits for graduation to reflect the addition of technology:

The change creates an option for a student to earn two credits in technology competency in meeting the number of credits required in prescribed academic areas. Board members would have liked to require technology competency, but did not do so because it would be an unfunded mandate to school corporations.

Indiana's specific language for requiring the study of technology may be viewed on the Internet (see <http://web.indstate.edu/soe/iseas/5-sbh.html>). Maryland states specifically that technology education is a 1-credit requirement for high school graduation. Nevada is one of the few states that encourages technology education in the elementary years. Nevada also requires technology education to be completed before the 8th grade. The time allocated for the study of technology in the elementary classes is a locally controlled aspect. Texas is a state with a mixed bag of opportunities for students. Portions of the standards listed in STL are required of all students under technology applications. These are standards 8 through 13 and standard 17 (See Table 2). Technology education in Texas is recommended for grades 6 through 8 and is an elective for grades 9 through 12. However, it is required in the enrichment curriculum for all students. All seventh grade students must take the Technology Life and Careers class for one credit, which is a technology education course. Virginia requires all students to complete one fine or practical arts course for graduation. Technology education courses may be taken to satisfy this requirement for grades 9 through 12. In West Virginia students are required to take Career Exploration at the middle school level, and technology education meets this requirement.

The local control aspect of the responses highlights what can be accomplished, if not on a state level. From the data collected, the local control may be the most hidden

asset for improving the status of technology education. Local control is the hallmark of Minnesota and the requirement of technology education varies across the state. The Minnesota Technology Education Association (MTEA) is working closely with the Sci-Math Minnesota Consortium to improve the recognition and value added of technology education in public schools. Nebraska has local district control. Each student must have 80 units, of which Career and Technical Education must be two of those units. Technology education can be a part of those 80 units, yet there is no state requirement. Tennessee currently requires the study of technology in grades 5 through 8, yet some systems in the state require it for all students. There is an effort underway to encourage the state board to require all 9th graders to acquire a course in technology education. Technology education is not required in Wisconsin, yet 90% of the local systems offer technology education as an option at the middle level (grades 6-8).

For the 16 states reporting that technology education is an elective, 81.3% provided a clarification to technology education being an elective. For example, in Arizona, technology education is an elective, yet 70% of the local districts require technology education. There are no statewide requirements for any subject in Arizona. Alabama offers technology education as an elective, but it is available for grades 7 through 10 only. In Illinois, technology education is an option (elective). Approximately 90% of Illinois students take technology education in the 9th and 10th grades as an option.

However, despite it being an elective, many of the high school students are required to study technology. In Iowa, technology education is an elective, but it is required at the local level in most of the middle and junior high schools, and a few dozen high schools across the state require it for graduation. New Mexico currently cites technology education as an elective; however, the Technology Education Association of New Mexico (TEANM) is preparing to officially endorse *STL* and begin to move technology education forward in the public schools. Ohio allows students to take technology education in the middle school, and they may use one to two and a half units of the technology education courses they take towards their 21-credit diploma. In Oklahoma, recent legislation requires that one-half to one credit of technology be completed, depending on the diploma students pursue. However, technology education is still an elective, and it is administered by local discretion. Many local districts in the state are choosing to use technology education as a means to meet the one-half to one credit requirement. In Oregon, some performance benchmarks, such as those in the Certificate of Advanced Mastery programs based on 'career pathways' imply technology education; however, it is still an elective there. Pennsylvania regards technology education as an elective at the high school level; however, it is required at the middle school and elementary school in order to meet state standards. Credit for taking a technology education course in South Dakota may be used toward the core requirements, yet

technology education is still considered an elective.

Of the ten states responding "No" to technology education being required, one-half of them gave written clarifications to the "No" response. These responses are as follows: Arkansas does not require technology education at the high school level; however, the state does ask that it be taught at grades 7 through 9. The respondent did not make it clear whether the requirement of technology education at those grades is required of all students in all three grades or rather that it will be required over time. In Delaware, technology education is not required; however, at the high school level students may select technology education as a career pathway (pathway program). In the pathway program, they must take three sequential years.

Some states use innovative methods to encourage students to take non-required courses. For example, if a student in Florida takes three technology education courses and maintains a 3.0 or higher grade point average, the student qualifies for a four-year college scholarship. New Jersey does not have state mandates. There is a ten-credit requirement at the high school level for visual, performing, and/or practical arts. Technology education is under the practical arts along with business and home economics. At present, there is no requirement for technology education in Wyoming. State standards for Wyoming will be implemented in technology education in the 2001–2002 school year.

For a summary of "Is technology education required in your state,

and if so, at what grade levels?” refer to Figure 2.

Technology Education Teachers

The third question in the survey, “How many technology education teachers are in your state?” resulted in the states responding with varied numbers of teachers teaching technology education. Many states include their teachers under a vocational heading, while others identify them separately. A total of 38,537 teachers are reported to be teaching technology education in the middle grades and high school (see Table 1 for a breakdown by state and territory). There is no complete record of the number of elementary teachers in the U.S. that are certified to teach technology education or incorporate technology education concepts and principles into their curriculum throughout the school year. “The term ‘elementary school

technology education’ (ESTE) is used to include all forms of elementary level activities that involve children from grades K-5 in hands-on, experiential activities that promote their understanding of the technological world in which they live” (Kirkwood, 2000). It is believed that the number of ESTE teachers is steadily growing and expanding as elementary teachers learn about the value of the study of technology. Brusic found “a majority (59%) of the ESTE teachers reported that the most significant benefit of ESTE is building lifelong skills, such as problem solving, creative thinking, and self-directed learning” (2001, p.3). A study of ESTE would be an important research project to determine to what extent the study of technology is being used in the elementary classrooms around the country.

In a recent study about technology education in the U.S., Sanders

(2001) reports about the characteristics of current technology education programs including faculty demographics and professional activity, the current content being taught and methods employed, and the typical course titles being used across the country. These questions were not addressed in this survey (see Sanders, 2001, for more on these topics).

For a summary of the approximate number of teachers of technology education in the U.S. refer to Figure 3.

Technology Education Educator Programs

The number of technology education educator programs in the U.S. was not a part of the survey. In order to determine the status of technology education teacher preparation programs, a review of *Industrial Teacher Education Directory (ITED)*, 2000-01, 39th edition was conducted.

The colleges and universities identified in this study (see Table 1) were the ones that listed possible majors for technology education, technology education certification, or industrial arts education in the *ITED*. Other listings were not considered. According to the *ITED*, there are approximately 105 teacher education programs for technology education, of which 14 provide elementary preparation. During the 1999–2000 school year, approximately 1077 graduates were prepared to teach technology education. Based on prior reports from the *ITED*, the findings reflected a decline in the number of graduates in technology education.

For a summary of the number

Requirement Status of Technology Education

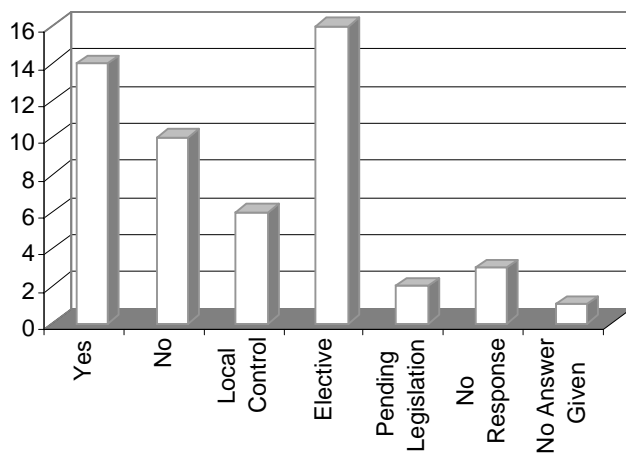


Figure 2: Summary of Responses to “Is technology education required in the state?”

Number of Technology Education Teachers and 1999-2000 Technology Education Graduates

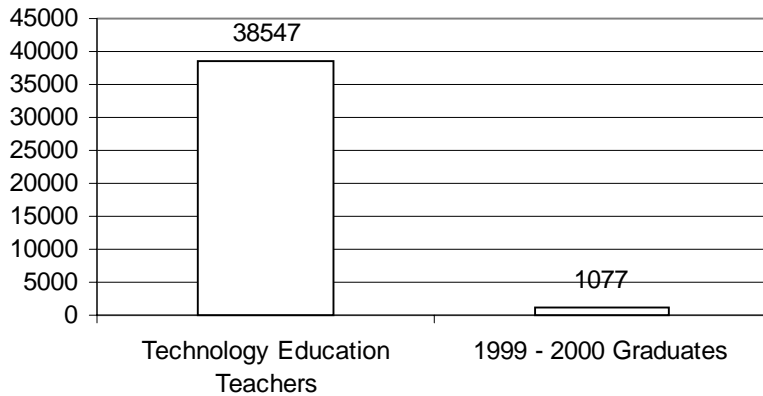


Figure 3: The approximate number of technology education teachers in the U.S. for school year 2000-2001 and the approximate number of graduates in technology education for 1999-2000.

of technology education educator programs refer to Figure 4.

SUMMARY

The responses to the survey provided many new insights into the status of technology education in U.S. public schools. In particular, the responses revealed that there are major movements being made at the local level for establishing technology education as an important subject in the pre-college programs. Many states are using the efforts of their localities to build support for the study of technology at the state level. In addition, many states are working to move the study of technology forward into the mainstream in order to afford all students the opportunity to experience technology education.

Several states reported that with the publication of *STL*, they now have a document that adds support to their state and local efforts and provides them with corroboration

and the needed support to continue to make the case for all students to be technologically literate. All states and territories are working to position technology education as a means for preparing their youth as

future citizens who live in a technological world, who will also be producers and consumers of the new technologies of the future. If the vision of *STL* is to be realized, the momentum must continue.

Technology Education Educator Programs

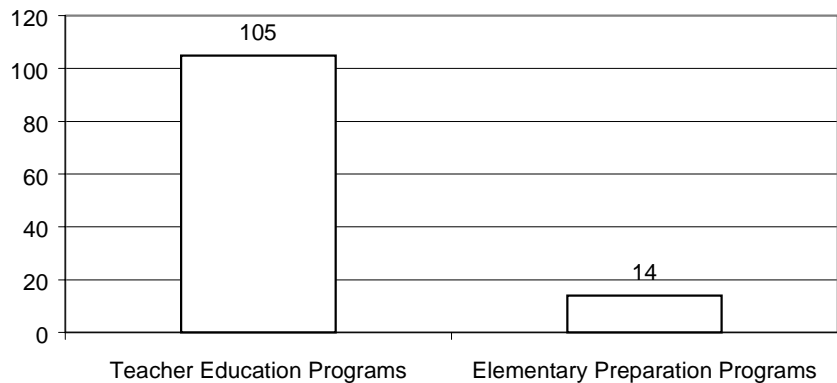


Figure 4: Estimated number of technology education teacher educator programs in the U.S. based on review of *ITED*.

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Table 1: Data Reflecting the Status of Technology Education in the U.S. 2000-2001

States	TE in State Framework?	TE Required, grades?	Number of Tech Ed Teachers?	Tech Ed Training Programs?‡
Alabama	Currently being integrated into the science course of study and will be part of the Career/ Technical course of study	Elective, available for grades 7 - 10	197	1 University of West Alabama - 0
Alaska	No	No	50	None
Arizona	No Currently working on a curriculum integrated project	Elective – 70% of the local districts require technology education (No statewide requirements for any subject)	3,000	1 Northern Arizona University - 16
Arkansas	Yes, Curriculum Content for Exploring Technology Education	No, but ask that it be taught at grades 7-9.	65	1 University of Arkansas at Pine Bluff - 0
California	Yes, Recommended in state curriculum guide	Elective	578	4 CSU-Fresno - 0 CSU- LA - 6 San Fran State - 155 San Jose State - 4
Colorado	Yes, Educational Technology and Technology Education are combined and coordinate both Colorado K-12 Content Standards and ITEA <i>STL</i> . See: http://www.cde.state.co.us/cdetech/et_stand.htm	Junior High requires at least 9 weeks of technology during students' 7-9 grade experience	2036	1 Colorado State University - 9
Connecticut	Yes	Recommendation before State Board	700	1 w/Elem Central Connecticut State - 19
Delaware	Yes, formerly approved by Board of Education February 2000 Adapted <i>STL</i> – Written into state frameworks	Not required – high school level may select TE as a career pathway and take for 3 sequential years	105	None

States	TE in State Framework?	TE Required, grades?	Number of Tech Ed Teachers?	Tech Ed Training Programs?‡
District of Columbia	No	No	NA	None
Florida	Yes Adopted <i>STL</i> – URL: http://technologyeducation.net	Not required – if a student takes 3 TE classes with 3.0 or higher average ...qualifies for 4 year college scholarship	2000	2 Florida International University -2 Univ. of South Florida - 40
Georgia	Yes	Yes – grades 6 - 8	550	2- 1w/Elem GA Southern Univ-35 The Univ of GA - 15
Hawaii	Yes...new set of standards one of which is “Career and Life Skills”	All standards are required for all students K-12	NA	1 Univ. of Hawaii - 0
Idaho	No – Vocational Ed Adopted <i>STL</i>	Elective – some districts do	245	1 Univ. of Idaho - 12
Illinois	Yes	Option – however 90% + do take it in the 9 th & 10 th grades as an option	1636	5 Chicago State - 14 E. Illinois - 12 Illinois State - 18 Univ of Illinois - 0 W. Illinois - 6
Indiana	Yes	Yes...see http://web.indstate.edu/soe/iseas/5-sbh.html	1200	2- 1w/Elem Ball State - 20 Indiana State - 4
Iowa	Yes	Elective – required at the local level for most middle/jr. high and at a few dozen high schools required for graduation	800	1 University of Northern Iowa - 17
Kansas	No	In progress of writing standards	800	3 Fort Hays State - 4 McPherson Coll - 0 Pittsburg St - 7

States	TE in State Framework?	TE Required, grades?	Number of Tech Ed Teachers?	Tech Ed Training Programs?‡
Kentucky	Yes	Elective, not required	400	5 Berea College - 1 E. Kentucky - 1 Morehead State - 2 Murray State - 0 W. Kentucky - 2
Louisiana	Working on state stds this summer...local curriculum will be developed based on the stds.	Elective	213	3 Grambling State - 0 Northwestern State - 0 Univ. of Louisiana de Lafayette - 0
Maine	No, offered primarily at the middle school	No	250	1 Univ. of Southern Maine - 1
Maryland	Yes, curriculum frameworks	1 credit in HS required for graduation	NA	1 Univ of MD-Eastern Shore - 1
Massachusetts	Yes, K-12 URL: http://www.doe.mass.edu/frameworks/updates.html	Yes, grades 5 & 8 - Part of MCAS – Science/Technology Engineering Framework	800	1 Fitchburg State - 11
Michigan	Yes	Yes, but with clarification. The state recommends, but it is required as part of Career Preparation System – 95% districts participate	1394	3-1 w/Elem Andrews Univ - 1 Central Michigan - 0 E. Michigan - 7
Minnesota	Local control with no state-wide rules to follow. Technology education is not in the frameworks, but Federal mandates are followed, such as Perkins III and others	Local control, varies across the state – Working with Sci-Math Minnesota and supporting with a \$25,000 grant to promote the standards	1148	4-1w/Elem Bemidji St - 7 Minnesota St - 3 St. Cloud - 14 Univ. of Minnesota - 8

States	TE in State Framework?	TE Required, grades?	Number of Tech Ed Teachers?	Tech Ed Training Programs?‡
Mississippi	Yes, in the Tech-Prep Framework	9 th graders who attend Tech Prep HS (95%) are required to take Technology Discovery	401	2 Jackson State - 4 Mississippi State - 0
Missouri	No, not yet Study in progress on population and tactile learning	Elective – some localities require at the middle school level	774	4 Central Missouri - 0 Coll. of the Ozarks - 1 Southeast MO St - 1
Montana	NR	NR	NR	2 Montana St - 18 N. Montana State - 3
Nebraska	No, but the ITEA clusters are part of the framework – need to revise according to the Stds. Doc	Local districts control. Each student must have 80 units, of which CTE must be two, tech ed could be a part of that. Not state required	504	1 Wayne State - 2
Nevada	Yes, have state standards for technology	Yes, before complete 8 th grade – time in courses determined locally.	85	None
New Hampshire	No – not formally Working on new curriculum guide and incorporating <i>STL</i>	Set hours required in grades 7-8, HS must meet a cluster, which includes tech ed, for graduation	210	1 Keene State - 2
New Jersey	No. TE is listed as an IA program next to woods and leather craft. IA is listed under Voc ed. In 1996 TEANJ developed standards. The NJDOE did take some of TEANJ standards and scattered them throughout other subject core areas.	NO STATE MANDATES There is a 10 credit requirement at HS for Visual, Performing and/or Practical arts (TE is under PA with business and home ec.)	2500	3 Kean Univ - 7 Montclair State - 0 The College of New Jersey - 20

States	TE in State Framework?	TE Required, grades?	Number of Tech Ed Teachers?	Tech Ed Training Programs?‡
New Mexico	No	Elective – TEANM is preparing to officially endorse the Stds doc	300	1 NM Highlands U - 0
New York	Yes	Mandates 1 unit by grade 8, some confusion with IT	3278	4 NY Technical Coll. - 3 NY U-Wash. Sq. - 3 SUC at Buffalo - 17 SUNY at Oswego -76
North Carolina	Yes, state’s Standard Course of Study	No	650	4 Appalachian State - 5 Elizabeth City State - 1 NCAT Univ - 20 NC State - 29
North Dakota	Yes, state’s Vocational framework – North Dakota Technology Education Office has adopted <i>STL</i>	Locally controlled. Jr. High. 7-8-9, a course is required; High school is still an Elective	115	2 - 1w/Elem Univ of ND - 3 Valley City State - 3
Ohio	No – Technology education has a framework and it is recognized as one of the ways students may achieve a technology experience. Legislation is pending and it is not clear how it will evolve.	Elective – middle school may take and it may be used for one to two and ½ units towards the 21 credit diploma	1900	4-1w/Elem Bowling Green St. - 9 Kent State - 0 Ohio N. Univ. - 4 Ohio State - 28
Oklahoma	Elective	Elective - recent legislation requires ½ to 1 credit of Technology depending on diploma pursued and is administered by local discretion; many are using technology education to fill the requirement	230	3 Northeastern State - 2 N. Oklahoma State - 0 S. Oklahoma State - 3

States	TE in State Framework?	TE Required, grades?	Number of Tech Ed Teachers?	Tech Ed Training Programs?‡
Oregon	Yes, as a placeholder, but not to the level of technological literacy	Elective — some performance benchmarks imply tech ed (i.e., Certificate of Advanced Mastery programs based on 'career pathways' include tech education)	NA	1 Oregon State Univ - 4
Pennsylvania	Local autonomy – http://www.pde.psu.edu/ – appears to be mainly vocational	Elective – high school, middle school, and elementary – required in order to meet state standards	2050	2 - with Elem Calif. Univ. of PA - 38 Millersville Univ - 50
Puerto Rico	NA	NA	465	NA
Rhode Island	NR	NR	NR	1 Rhode Island Coll - 18
South Carolina	No	No	275	1 w/Elem Clemson Univ - 5
South Dakota	Yes	Elective – not required; however, credit for tech ed may be used toward core requirements	230	1 Black Hills State - 28
Tennessee	Yes	Grades 5 - 8, some systems in state require. In process of working with State Board to require all 9 th graders acquire a course in tech education	325	3 E Tenn State - 7 Middle Tenn State - 0 Univ. of Tennessee - 7
Texas	Yes, see http://www.tea.state.tx.us/rules/tac/ch123toc.html Also see http://www.tea.state.tx.us/rules/tac/chapter074/ch074a.html and www.texastechnology.com	Portion required of all students as Technology applications (Covers Stds 8-13 & 17) Recommended grades 6-8; Elective 9-12; Required in the enrichment curriculum for all	1983	5 Abilene Christian U - 0 Sam Houston State - 0 Tarlatan State Univ - 1 Texas A&M - 0 U of Texas at Tyler - 2

States	TE in State Framework?	TE Required, grades?	Number of Tech Ed Teachers?	Tech Ed Training Programs?‡
Utah	Yes	Yes, all 7 th graders must take Technology Life and Careers class for one credit	500	3 - 1w/Elem Brigham Young - 16 Southern Utah - 19 Utah State - 5
Vermont	NR	NR	NR	None
Virginia	Yes	Yes, students are required to complete one (1) fine or practical arts course for graduation. Technology education courses may be taken to satisfy this requirement. Grades 9-12	1100	5-2w/Elem James Madison - 1 Norfolk St - 5 Old Dominion - 40 VPI&SU - 20 VA State - 3
Washington	Vocational URL: http://www.k12.wa.us/techindustry/ The State of Washington has adopted <i>STL</i> as their skill standards for technology education. Also, they have adapted the standards for the program standards for technology teacher education programs in Washington.	Elective	760 Used URL	3 E. Washington U - 2 Walla Walla College - 0 W. Washington U - 9
West Virginia	No	Career Exploration required at middle school – Tech ed meets	237	2 Fairmont State - 0 W. VA Univ - 9
Wisconsin	Yes	No - Middle level (6-8) local discretion and 90% offer as an option	1300	2-1w/Elem U of WI-Platteville - 1 U of W-Stout - 53
Wyoming	Yes	No requirement, state standards will be implement in technology education in 2001-2002 school year	198	None

TE in State Framework?	Totals:	Percentages:	Number of Tech Ed Teachers? 38,537
Yes	30	57.7%	
No	18	34.6%	
No Response	3	5.8%	
No Answer	1	1.9%	
TE Required, grades?	Totals:	Percentages:	Tech Ed Training Programs?‡ 106 Progs. [14 (Elem)] 1079 graduates 1999-2000
Yes	14	27%	
No	10	19.2%	
Local	6	11.5%	
Elect	16	30.8%	
Pending	2	3.8%	
No Response	3	5.8%	
No Answer	1	1.9%	

NOTE:

Data collected as of 04/05/2001 from 47 out of 50 states contacted as well as the District of Columbia and Puerto Rico, of which 46 are complete.

‡ Data collected from Industrial Teacher Education Directory (ITED), 2000-01, 39th edition.

NR: No response from Montana, Rhode Island, and Vermont on all questions.

NA: The District of Columbia, Hawaii, Maryland, and Oregon provided data on technology education in the state framework and if technology education was required. Puerto Rico provided data on the number of teachers only.

The Standards for Technological Literacy

The Nature of Technology

- Standard 1** Students will develop an understanding of the characteristics and scope of technology.
- Standard 2** Students will develop an understanding of the core concepts of technology.
- Standard 3** Students will develop an understanding of the relationships among technologies and the connections between technology and other fields of study.

Technology and Society

- Standard 4** Students will develop an understanding of the cultural, social, economic, and political effects of technology.
- Standard 5** Students will develop an understanding of the effects of technology on the environment.
- Standard 6** Students will develop an understanding of the role of society in the development and use of technology.
- Standard 7** Students will develop an understanding of the influence of technology on history.

Design

- Standard 8** Students will develop an understanding of the attributes of design.
- Standard 9** Students will develop an understanding of engineering design.
- Standard 10** Students will develop an understanding of the role of troubleshooting, research and development, invention and innovation, and experimentation in problem solving.

Abilities for a Technological World

- Standard 11** Students will develop the abilities to apply the design process.
- Standard 12** Students will develop the abilities to use and maintain technological products and systems.
- Standard 13** Students will develop the abilities to assess the impact of products and systems.

The Designed World

- Standard 14** Students will develop an understanding of and be able to select and use medical technologies.
- Standard 15** Students will develop an understanding of and be able to select and use agricultural and related biotechnologies.
- Standard 16** Students will develop an understanding of and be able to select and use energy and power technologies.
- Standard 17** Students will develop an understanding of and be able to select and use information and communication technologies.
- Standard 18** Students will develop an understanding of and be able to select and use transportation technologies.
- Standard 19** Students will develop an understanding of and be able to select and use manufacturing technologies.
- Standard 20** Students will develop an understanding of and be able to select and use construction technologies.

Table 2: Listing of the twenty standards for technological literacy (ITEA, 2000)