ED 454 811   IR 020 789

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TITLE   Report of the 2000 Texas Public School Technology Survey
                    Prepared for the Telecommunications Infrastructure Fund
                    Board and Texas Public Schools.
PUB DATE   2000-04-16
NOTE   15p.
PUB TYPE   Reports - Research (143)
EDRS PRICE   MF01/PC01 Plus Postage.
DESCRIPTORS   *Computer Uses in Education; Educational Development;
                    Educational Resources; Elementary Secondary Education;
                    Public Schools; School Surveys; State Aid
IDENTIFIERS   *Technology Integration; Texas

ABSTRACT
            Over the past three legislative sessions, the Texas State
Legislature enacted laws that have accelerated the integration of technology
into public education. Significant efforts to build technology infrastructure
in Texas are evident through the thousands of public school awards provided
by the Telecommunications Infrastructure Fund Board (TIF), the Technology
Literacy Challenge Fund grants, and the E-Rate discounts. With such an influx
of funding into technology education, the following question was posed to
guide this Texas Public School Technology Survey for the year 2000: "What
technology resources have been put in place in schools as a result of these
awards?" The telecommunications infrastructure in public schools across Texas
has changed significantly across the past 5 years, with over 96% of
classrooms in Texas public schools having Internet access. Also, technology
professional development activities for Texas classroom teachers have
received additional support. Much still needs to be accomplished, because
only 18% of the school districts surveyed indicated that their teachers use
online resources in their instruction. (AEF)

Report of the 2000 Texas Public School Technology Survey
Prepared for the Telecommunications Infrastructure Fund Board
and Texas Public Schools

April 16, 2001

Jon Denton, Trina Davis and Arlen Strader – Texas A&M University

In 1994, the *Goals 2000: Educate America Act* became law. This act contained a number of provisions designed to foster instructional applications of technology in classrooms across the nation (President's Committee of Advisors on Science and Technology, 1997). The technology infrastructure and staff development to use the technology for classroom applications have become important sources of benchmarks to mark progress with the integration of technology into our classrooms.

Over the past three legislative sessions, the Texas State Legislature enacted laws that have accelerated the integration of technology into public education. Significant efforts to build technology infrastructure in Texas is evident through the 2,300 public school awards provided by the Telecommunications Infrastructure Fund (TIF) Board by the end of the Fiscal year 1999 (TIF website, 2001); the 113 competitive Technology In Education (TIE) grants also called the Technology Literacy Challenge Fund grants that have provided 1,963 awards to school districts from 1997 through 2000 (TEA, 2000); and the 812 district technology plans certified by the Texas Education Agency for E-Rate discounts in year one of the program (TEA, 2000). With such an influx of funding into technology education, the following two questions were posed to guide this inquiry. What technology resources have been put in place in schools as a result of these awards? And second, what professional development activities are being provided to educators to use these technology resources?

Few states invest adequately in either pre-service or in-service technology professional development for educators. As a result, most teachers have little direct experience in observing and learning about the wide range of computer-telecommunications applications for classrooms. An Education Commission of the States document (ECS, 1998) states that only 15 percent of the K-12 teachers in the nation have received as much as 9 hours of training in technology. Further, this report notes that the average school district expenditures for technology devoted to teacher training is reported to be 6% while the recommended level is 30%. These expenditures are beginning to rise; an annual survey by Market Data Retrieval notes that 17% of public school technology spending in FY00 went to teacher professional development (Web-based Education Commission, December 2000). The Web-based Education Commission's report to the President and the Congress of the United States includes the admonishment, "not enough is being done to assure that today's educators have the skills and knowledge needed for effective web-based teaching." The report goes on to state, that if this situation is not remedied immediately, "we will have lost an opportunity to enhance the performance of a whole generation of new teachers, and the students they teach."

Context

In 1996 and again in 1998, the Texas Association of School Administrators (TASA) with technical support from the South Central Regional Technology in Education Consortia-Texas (SCR*TEC-TX) at Texas A&M University (TAMU) conducted surveys of the technology infrastructure in all public schools in Texas. Between 76% and 82% of the 1043 school districts in Texas participated in those survey efforts. Results of these Technology surveys are available at http://eEducation.tamu.edu/. This site provides an electronic file and associated software, *Web Survey Builder* that enable data to be electronically collected with the added feature of allowing school personnel to partially complete the instrument and return at later times to complete and submit their responses. The collected data are then partitioned and analyzed with respect to different geographic and school size classifications enabling customized reports for each reader. Anecdotal evidence indicates this site has been frequently accessed and used in developing proposals for technology support by schools across the state. With the recognition of the service TAMU provided to school districts and state agencies with these Technology Infrastructure Surveys, a decision was readily made to undertake another technology survey. It is hoped this effort conducted in conjunction with the beginning of the 77th Texas Legislative session, will provide valued information to schools and legislators regarding technology integration into the public schools of Texas.

Method

Instrument Development: An initial draft of the survey instrument was developed at a meeting on August 17, 2000 held at TASA headquarters in Austin. This draft was based on the 1998 instrument, with new items presented at this meeting linked to the Texas STaR Chart (TEA, 2001). Participants at this meeting included Johnny Veselka and Ellen Bell from TASA, Anita Givens from the Texas Education Agency (TEA); Gary Grogin from the Telecommunications Infrastructure Fund Board (TIFB) and Jon Denton, Trina Davis and Arlen Strader from TAMU. The instrument subsequently underwent revisions to incorporate suggestions from these individuals resulting in the final version that contains 49 items organized into the following seven sections [District Demographics (3 items), District Policies (6 items), District Technology Infrastructure (11 items), Technology Support and Sustainability (8 items), Technology Integration and Use (8 items), Professional Development (7 items), Outreach/Communication (6 items)]. The instrument and data collection procedures were submitted to and approved by the Texas A&M University Institutional Review Board for research involving human subjects. The items were then integrated with the *Web Survey Builder,* enabling the TASA-TEA-TIFB-TAMU supported effort entitled, **2000 Texas Pubic School Technology Infrastructure and Implementation Survey** to be conducted and instantaneously analyzed over the Internet.

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Data Collection

Data collection began on Friday, October 27, 2000 when a letter from Johnny Veselka, Executive Director of TASA, was mailed to all 1043 Texas school superintendents. The letter contained the following directions to complete the survey. "The survey is available on-line at the Web site, http://eEducation.tamu.edu/TechSurvey2000/ so that you or your assigned staff can complete it in a short time. Use your county-district number to log in; do not put a "dash" between the two numbers. Use "texas1" as the password. As always, data gathered from the 2000 survey will be available to any district, ESC or other interested party, and data from the 1996 and 1998 surveys also are available to you for comparison purposes." On Monday, December 4, 2000 a reminder e-mail message was sent to superintendents, whose districts had not responded to the survey. This e-mail message, that encouraged completion of the survey, resulted in over 100 surveys being submitted over the following two weeks.

A second e-mail message that included another request to complete the survey online with an attached descriptive statistical summary of the initial 388 responses for the survey was sent to non-responding school districts on Friday, January 5, 2001. An e-mail message was also sent to district officials who submitted a completed survey thanking them for their participation. This message included an attached preliminary summary of survey results. A third e-mail request was sent on Friday, January 26, 2001 and telephone follow-up calls to districts who had partially completed the on-line survey and other districts were contacted that had not logged-on to the survey during the final weeks of data collection, mid-February through the end of March. The closing date for receipt of surveys was Friday, March 30, 2001 enabling five months for data collection. With the exception of the initial letter from Dr. Veselka to superintendents, all communications and data collection processes were conducted electronically.

At the conclusion of the data collection phase, 708 districts had accessed the survey with 638 districts (61%) completing all or portions of the survey. A review of districts responding to the survey from the twenty Educational Service Center regions was made. All regional service center regions were represented with the response ratio ranging from 38% (Region 19) to 77% (Region 3). Table 1 provides a regional breakdown of the number of participating districts.

Table 1. Percent of Districts by ESC Regions Participating in Survey																			
ESC Region	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
# Districts Responding	16	24	31	39	22	33	57	28	20	54	52	45	34	27	32	45	43	24	5	36
Percent Responding	40	52	77	54	74	58	59	58	49	61	67	54	53	63	74	69	73	73	38	58

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A review of the responding districts with enrollments of 50,000 or more students revealed that 9 of 12 districts responded to the survey. The cumulative student enrollment of the districts that responded to the survey represents 67% of the total student public school enrollment in Texas. Table 2 provides a breakdown by district size of the number of participating districts.

Table 2. Percent of Districts by District Size Participating in Survey			
District Size	Total Enroll	# Districts Respond.	Percent Respond.
50,000 and Over	929,714	9	75
25,000-49,999	838,583	15	63
10,000-24,999	737,630	32	68
5,000-9,999	443,071	39	59
3,000-4,999	332,575	59	69
1,600-2,999	284,887	88	68
1,000-1,599	152,735	77	65
500-999	169,401	138	59
Under 500	103,783	191	41
	3,991,783		

Data Analysis & Findings

Once submitted, data were verified with respect to the district name and/or district-county identification number and a TAMU staff member reviewed each item response. If item responses appeared unusual or questionable, the district was e-mailed to check and confirm responses to particular items. Once this validation process was completed, the district's data were concatenated with other district data and saved as Microsoft Excel files. The attached Report 2000 Texas Public School Technology Survey represents a snapshot of data obtained and validated through March 30, 2001.

While this information is useful from a state-wide perspective, we encourage readers to refer to http://eEducation.tamu.edu/ for electronic renderings of the results of this survey effort that can be specialized for particular information needs. Summaries can be requested by: size of enrollment or Educational Service Center Region. In mid-April 2001, a final report will be e-mailed to all Texas school districts.

Summary of Survey Items

The following table presents a cumulative response for each survey item. A few items requested textual responses that are not summarized in the table.

Table 1. Texas Public School Technology Infrastructure Survey Findings – March 31, 2001

Item	
II. District Policies	
1. Has your district benefited from HB2128 (TIF Board funding)? [% responding Yes]	86%
2. Has your district applied for an E-Rate (federal) rebate? [% responding Yes]	92%
3a. What has been reimbursed by E-Rate rebate? [% responding - Telecommunication Services]	78%
3b. What has been reimbursed by E-Rate rebate? [% responding - Internal Wiring]	35%
4. Does your district use Internet filtering software? [% responding Yes]	88%
5a. Does your district have an "acceptable Internet use policy?" - for students [% responding Yes]	96%
5b. Does your district have an "acceptable Internet use policy?" - for staff [% responding Yes]	88%
5c. Does your district have an "acceptable Internet use policy?" - for parents if access provided [% responding Yes]	40%
6a. Desired technology assistance [% responding staff development on technology integration in class]	80%
6b. Desired technology assistance - [% responding developing grant applications for technology support]	65%
6c. Desired technology assistance - [% responding establishing a technology consortium]	41%
6d. Desired technology assistance - [% responding conducting a district/school technology audit]	38%
III. District Technology Infrastructure	
7a. How many Internet-accessible computers are located in your elem classrooms? [Average #]	2.1
7a. How many Internet-accessible computers are located in your M.S. classrooms? [Average #]	2.1
7a. How many Internet-accessible computers are located in your H.S. classrooms? [Average #]	2.2
items 8 & 9 related to item 7 & 10	
10a. What percentage of Elementary classrooms have internet access?	94%
10b. What percentage of Middle School classrooms have internet access?	97%
10c. What percentage of High School classrooms have internet access?	96%
11. What is the bandwidth of your districts main Internet connection? [% of reporting districts with T1 or greater bandwidth]	94%
12. How many of your district's campuses have 2-way videoconferencing capabilities? [Average #]	1
13. How many of your campuses have video distribution from a central source? [Average #]	2
14. How often do you replace old technology? 4-5 years [% of reporting districts]	47%
15. What percentage of your teachers has home access to Internet? [half to all teachers]	45%
16. What percentage of your students has home access to Internet? [half to all students]	16%
17. What is your greatest need in technology infrastructure? [highest % "more classroom computers"]	45%
IV. Technology Support and Sustainability	
18. Last year, what did you spend on technology? [Average $ reported]	$596,490
19. Last year, what did you spend for professional development on technology? [Average $ reported]	$101,879
20. Number of on-site technical support personnel [% of districts reporting support provided from central office]	59%
21. Number of on-site instructional technology support personnel [% of districts reporting support provided from central office]	46%
22. Average Response time for technical support [cumulative % reported " within 2 hrs and same day"]	35%
23. Average Response time for instructional support [cumulative % reported "within 2 hrs and same day"]	46%
24. What is your greatest need in technology support and sustainability? [highest % reported - more technical support personnel]	49%
25a. Does your district make laptops available for checkout to faculty? [% of districts reporting Yes]	37%
25b. Does your district make laptops available for checkout to students? [% of districts reporting Yes]	8%

V. Technology Integration and Use	
26. What % of your teachers use technology productivity software? [% of districts reporting .75 to all teachers]	53%
27. What % of your teachers use instructional software in support of the TEKS? [% of districts reporting .75 to all teachers]	19%
28a. What % of your teachers use the Internet for e-mail/online forums [% of districts reporting .75 to all teachers]	57%
28b. What % of your teachers use the Internet for accessing Web-based curricula [% of districts reporting .75 to all teachers]	10%
28c. What % of your teachers use the Internet for collaborative learning projects [% of districts reporting .75 to all teachers]	2%
28d. What % of your teachers use the Internet for research [% of districts reporting .75 to all teachers]	21%
29. What % of your teachers have integrated technology into their teaching? [% of districts reporting .75 to all teachers]	16%
30a. What % of your teachers are just beginning to learn technology applications [Average %]	12%
30b. What % of your teachers know the basics and use computer for e-mail [Average %]	37%
30c. What % of your teachers are beginning to use Internet for instruction [Average %]	24%
30d. What % of your teachers are using on-line resources and using Internet tools in student assignments [Average %]	18%
31a. Indicate the average number of hours per week elementary students use computers for learning. [highest % - 2 to 4 hrs]	57%
31b. Indicate the average number of hours per week M.S. students use computers for learning. [highest % - 2 to 4 hrs]	41%
31c. Indicate the average number of hours per week H.S. students use computers for learning. [highest % - 5 to 9 hrs]	37%
32a. What % of your students use computers for productivity applications? [% of districts reporting .75 to all students]	13%
32b. What % of your students use computers for on-line research on topics? [% of districts reporting .75 to all students]	18%
32c. What % of your students use computers for accessing Web-based curricula? [% of districts reporting .75 to all students]	1%

VI. Professional Development	
33. What is your district's greatest need in the area of technology integration and use [highest % reported - staff development in technology applications]	55%
34. What % of your teachers use professional development ideas to design lessons [% of districts reporting .75 to all teachers]	10%
35a. Who are the technology professional development providers in your district? [highest % reported - ESC personnel]	73%
35b. Who are the technology professional development providers in your district? [next highest % reported - full time teacher]	45%
36. How is your district's technology professional development delivered? [highest % reported - face to face]	90%
37. What type of technology professional development is needed most? [highest % reported - curriculum integration]	54%
38. What is your greatest need for administrators' technology professional development [highest % reported - strategic planning, and evaluation and identification of best practices]	33%
39. Estimate the hours of campus-based technology professional development using technology for communications (e-mail,LISTSERVE@) offered per year [highest % reported for 1-6 hrs]	61%
40. Average hours of professional development completed for each teacher each year [highest % reported for 1-6 hrs]	34%

VII. Outreach/Community	
41. Does your district use the web to communicate general information to the public? [% responding Yes to providing district calendar]	74%
42. Percent of teachers with inst. Web pages to communicate with parents/students [% of districts reporting .5 to all teachers]	2%
43. Do you provide computer access to community members outside of school day? [% responding Yes]	47%
44. Average number of individuals using district computer resources. [highest % reported this service 1-9 individuals]	23%
45. What organizations do you collaborate with in your community to share tech resources [highest % reported –public library]	56%
Item 46. provided text data	

Highlights from these item summaries include:
- High level of participation in E-Rate telecommunications rebate program. (86%)
- High use of district use of Internet filtering software. (88%)
- High level of acceptable use policies for technology resources. (96% for students)
- Internet-linked computers to classroom ratio (2.1)
- High level of classrooms with Internet access (96%)
- Average of one (1) two-way videoconferencing system per district.
- Most cited technology replacement cycle by districts is 4 to 5 years.
- Greatest infrastructure need cited by districts: more classroom computers.
- Fifty-nine to forty-six percent of districts report providing technical support personnel and instructional technology support personnel at the district level
- Average response for technical support is same day (35%) or next day (25%).
- Slightly more than one-third of the districts provide laptops for check-out to their teachers.
- Low use of technology tools by teachers for instruction related to TEKS(19%)

Technology Trends

A number of comparisons are offered from information collected across the three state-wide surveys. Financial support, professional development, technology infrastructure, and use of technology are examined to determine the trends across this five-year period.

Technology Infrastructure Support
Similar questions were posed across surveys about expenditures targeted for technology. The following question from the '00 survey captures the essence of the items posed. *"During the ... school year, what amount (in dollars) of your total annual expenditures was dedicated to technical and instructional technology support? (Include salaries, hardware, software, development activities, etc.)"* Although the items were expressed similarly across the surveys, the response option changed for the "00 survey, preventing a direct comparison across this period for average expenditures, except for the "00 survey.

Table 2. Financial Support for Technology Infrastructure Reported by ISDs			
Amount	1996*	1998*	2000*
Less than $250,000	553	497	411
Between $250,000 and $500,000	80	118	82
Between $500,000 and $1,000,000	13	43	44
Between $1,000,000 and $10,000,000	64	76	60
Above $10,000,000		11	6
Average expenditure			$ 596,490
* number of ISDs reporting	710	745	603

The source of funds was not asked in these questions, but it is reasonable that state and federal funds have augmented local funds and influenced the trend of greater technology expenditures by schools. A question on personnel costs associated with technical support and instructional support provided by the school district was introduced in the "00 survey. An average of $101,879 was reported across 603 districts to provide technical and instructional support each year.

Professional Development on Technology

Although the three surveys posed a number of questions about staff development related to technology, items were sufficiently different permitting just two direct comparisons. The topic of professional development and the number of sessions provided by the districts each year did offer bases for comparison across time. Table 3 provides a summary of district responses to these common variables. Across the five years covered by these surveys, the emphasis placed on professional staff development in schools across Texas has increased. The two ends of the continuum, (i.e., more that 10 sessions and no sessions offered) reflect the shift toward greater emphasis on technology training to professional staff across the schools.

The topic noted by 80% of the respondents to the ' 00 survey is a need for teacher development on technology integration in classrooms, while for school administrators, strategic planning for technology and identification of best technology practices are important needs..

Over the past three years, the most cited staff development providers were identified by the participating districts as district staff (89.8% in '98 and 73% in '00) and Educational Service Center staff (86.3% in '98 and 73% in '00). Trade association staff (5.2% in '98 and 11% in '00) and higher education personnel (12.5% in '98 and 10% in '00) were cited far less frequently as resources for technology training to schools districts. Ninety percent of the school districts reported in the '00 survey that technology professional development is delivered in a face-to-face mode.

Table 3. Staff Development on Technology Reported by ISDs			
Number of Sessions	1996	1998	2000
	%	%	%
More than 10	8.6	29.7	26
7 to 10	2.6	18.6	25
3 to 6	20.2	31	17
1 to 2	48.8	17.4	17
No sessions	19.6	3.5	4
Total Responses	847	781	638

Assistance Needs of ISDs			
Grant procurement	68.4	75.7	65
Conducting technology audits	43.8	45.7	38
Forming a technology consortium	48.2	43.6	41
Developing a technology use plan	55.8	45.8	36
Staff Dev on technology integration	78.2	88.7	80
Total Responses	847	727	638

Current technology infrastructure

 Internet classroom access was addressed across the surveys and is summarized in Table 4. Access increased dramatically at the campus level, illustrated by high percentages of campuses with "No Internet Access" in 1996, while the percentage of campus classrooms having "75% or More" Internet Access in 2000 had increased substantially.

Table 4. Number of Classrooms with Internet Access				
	# of ISDs Reporting		No Access	75% or More
Elementary				
	199	841	70.70%	12.40%
	199	568		59.20%
	200	638		94.00%
Middle School				
	199	841	77.20%	8.80%
	199	497		64.30%
	200			97.00%
High School				
	199	841	71.20%	9.40%
	199	562		65.80%
	200	638		96.00%
One-campus ISD				
	199	201		79.80%

While all three surveys address the number of computers per student, only the 2000 survey asked how many internet-accessible computers are located in the classroom. The responses across elementary, middle and secondary schools range from 2.1 to 2.2 internet-linked computers per classroom.

Use of technology

Comparable items across the surveys included classroom use of Internet by students and the type of Internet applications. Table 5 presents these data although the nature of the

presented information varies due to the nature of the response opportunities provided on the surveys.

Table 5. Percentage of Students Using Internet in Classroom Instruction						
		Number of ISDs	No Access	1- 49%	50 - 75%	75% or more
Elementary						
	1996	840	80%	19%	0%	0%
	1998	776		76%	14%	10%
	2000	638	11%			81%*
Middle School						
	1996	841	78%	21%	0%	1%
	1998	727		66%	20%	15%
	2000	638	13%			80%*
High School						
	1996	839	63%	35%	0%	1%
	1998	734		56%	24%	20%
	2000	638	11%			80%*

Student Applications of Internet				
	1996	1998	2000	
Number of ISDs Reporting	841	727	638	
E-mail/ on-line forums	13%	31%		
Accessing web-based curricula	3%	47%	66% for .01 to .25 time	
Exploring (web-browsing)	29%	84%		
Research for class assignments	34%	77%	44% for .51 to 1.0 time	
As part of course work	22%			
Uploading/downloading data		37%		
Collaborative learning multiple sites		17%	65% for .01 to .25 time	
Problem solving			63% for .01 to .25 time	
Drill/Practice			37% for .51 to 1.0 time	
Productivity applications (word processing and spreadsheets)			39% for .51 to 1.0 time	

* Percent values do not total 100% due to non-responses to this item.

The increasing use of the Internet for instruction is very evident across the type of school (elementary, middle or high school). It appears that a shift from roughly 70% of the students with no access to the Internet for instructional applications jumped to 80% of the students using the Internet across this five-year period.

Comparing the kinds of Internet applications by students across the past five years is difficult due to the types of response opportunities provided on the surveys. A number of different applications were provided across the surveys and the response options changed on the 2000 survey. In general, applications such as, drill and practice, productivity applications and on-line information gathering for research are used fairly widely by students, while collaborative learning projects, problem solving and decision making exercises, and accessing web-based curricula are just beginning to occur.

Discussion and Conclusions

The telecommunications infrastructure in the public schools across Texas has changed significantly across the past five years. Financial support for technology to schools has been substantial, resulting in dramatic changes in classroom connectivity and classroom technology equipment. The level of connectivity recorded in 1996 was modest with over 70% of the districts reporting **no** classroom access to the Internet, while in 2000, over 96% of classrooms in Texas public schools participating in this survey reported having Internet access. These percentages, compare very favorably with national values, that report classroom connectivity soared from 14% in 1996 to 63% in 1999 (Web-based Education Commission, December 2000). These dramatic changes in connectivity in Texas public schools have been impacted substantially by the 2,300 awards provided by the TIF Board (TIF Website, 2001); the 1,963 awards of the Technology Literacy Challenge Fund (TEA, 2000); and the high level of participation in the E-Rate program (TEA, 2000).

In terms of Internet-linked workstations for students, the 2000 survey results from participating districts indicate today's classroom holds two networked computers. This ratio corresponds to the student to computer ratio of 8.9:1 value reported for 1999 in the Texas Education Agency's *Progress Report on the Long-range Plan for Technology, 1996-2010* (December, 2000), and the national average of 9 to 1 (Web-based Education Commission, December 2000). While these values are consistent with one another, a substantial gap exists between the current ratio and the recommended student to computer ratio of 3:1 in the *Long Range Plan for Technology, 1996-2010* (TEA, 1996).

Technology professional development activities for Texas classroom teachers have received additional support across time. This is encouraging information, but much still needs to be accomplished, because just 18% of the participating districts indicate their teachers use on-line resources in their instruction. For comparison purposes at the national level *The Power of the Internet for Learning Moving from Promise to Practice* (Web-based Education Commission, December 2000) notes that a recent survey found that most teachers have some facility using computers, but do not know how to apply these computer skills in classroom instruction. Perhaps this is what district technology coordinators were thinking in the 2000 survey, when the most needed technology professional development program cited was for curriculum integration with technology.

Given the responses to the survey and the trend analyses, slightly modified recommendations from a recent national report (Web-based Education Commission, December 2000) appear to be appropriate for concluding this discussion:
- Sustain technology funding for Texas public schools;
- Continue providing reliable safeguards to protect on-line learners and ensure their privacy;
- Increase "on-request" technical and instructional support to teachers for technology problems;
- Continue high quality, on-demand professional development support for teachers and administrators;

- Provide on-line educational content that is affordable and meets the highest standards of educational excellence; and
- Enable universal broadband access at home and school to support learner-centered educational opportunities.

This report provides evidence that Texas schools are "in progress" with respect to attaining each of these recommendations. For the recommendations of broadband access at school, and reliable safeguards to protect on-line learners, Texas districts are approaching the criterion of 100 percent for providing the recommended service and seeking and investing in technology. Providing high quality professional development, and providing rapid technology technical assistance are services that schools are "in-progress" of attaining, but continued effort and additional resources are needed to attain these recommendations. Schools districts in Texas appear to be at the beginning of their journeys for providing broadband access to the students at home, and for developing quality on-line educational content. For these recommendations to be completely met, continuing resources are essential from state and federal sources to schools. The remarkable changes in the technology infrastructure supporting Texas public schools can be directly linked to school leaders attuned to the E-Rate program and the grants and policies of the Telecommunications Infrastructure Fund Board and the Technology Literacy Challenge Fund. These resources are invaluable in integrating technology into classroom activities and must be continued, if our students are to benefit from a digital advantage that our schools now can provide.

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Abstract

Over the past three legislative sessions, the Texas State Legislature enacted laws that have accelerated the integration of technology into public education. Significant efforts to build technology infrastructure in Texas is evident through the thousands of public school awards provided by the Telecommunications Infrastructure Fund Board (TIF), the Technology Literacy Challenge Fund grants and the E-Rate discounts. With such an influx of funding into technology education, the following question was posed to guide this inquiry. What technology resources have been put in place in schools as a result of these awards? The telecommunications infrastructure in the public schools across Texas has changed significantly across the past five years with over 96% of classrooms in Texas public schools having Internet access. Also, technology professional development activities for Texas classroom teachers have received additional support. Yet much still needs to be accomplished, because just 18% of the districts indicate their teachers use on-line resources in their instruction.

April 16, 2001

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Title:	Report of the 2000 Texas Public School Technology Survey Prepared for the Telecommunications Infrastructure Fund Board and Texas Public Schools
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Corporate Source:	Texas A&M University	Publication Date:	April 16, 2001

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