

STATE OF THE STATE

AN ANALYSIS OF TECHNOLOGY IN WASHINGTON SCHOOLS

*Smart Tools for Tomorrow's Schools Executive Summary September
1998*

Martha Ann Cepress
A Report for the Technology Alliance

Overview

In April 1998, the Technology Alliance mailed a fax-back survey to Washington State's 296 school districts. The survey had two goals: to provide a snapshot of the status of technology in public schools and; to build a reliable source of data that will enable educators and decision-makers to track progress, measure success, and identify areas in need of improvement over time. (This survey will be used in subsequent studies sponsored by the Technology Alliance and conducted by the Office of the Superintendent of Public Instruction).

To this end, the survey included questions regarding spending, sources of funding, technology plans, "connectivity" and hardware demographics, bonds and levies, and also provided an opportunity to share both pressing issues as well as success stories. A copy of the questionnaire distributed to the school districts can be found at the end of this report.

In a concerted effort with the Office of the Superintendent of Public Instruction (OSPI), the Technology Alliance achieved a response rate of 78 percent, or 227 districts.¹ These districts represent approximately 82 percent of the state's students.

Data from the responding districts, including "poverty variables" such as per-pupil property assessment, and percentage of participation in a free or reduced lunch program obtained from OSPI, were then compiled and analyzed. The results of these analyses can be found within the subsequent six sections of this Executive Summary: Key Findings, Funding and Expenditures, Demographics, Equity, Pressing Issues, and Success Stories.

For simplicity, some analysis was conducted by comparing the state's nine Educational Service Districts (ESDs) which include; Spokane (ESD 101); Yakima (ESD 105); Vancouver (ESD 112); Olympia (ESD 113); Bremerton (ESD 114); Puget Sound (121); Walla Walla (123); and Wenatchee (ESD 171). Full data reports comparing individual districts with the overall state findings can be found at www.technology-alliance.com, or by contacting the Technology Alliance at 206-389-7348.

Results are assumed to be statistically significant within ± 3 percentage points at the 95 percent confidence interval. That is, 95 times out of 100, the results will differ by no more than three percent from what would have been obtained by surveying all 297 districts.

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Key Findings

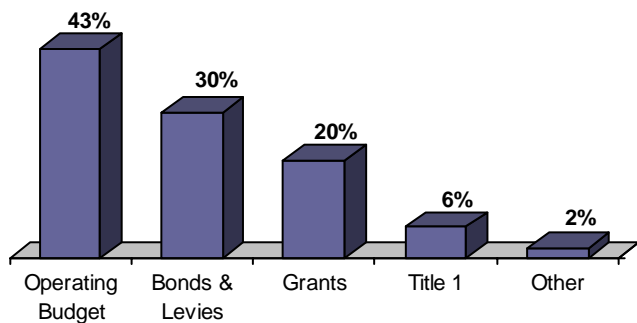
- Spending on technology in Washington State during the 1997-98 school year averaged approximately \$133 per student
- Bonds and Levies provide the second largest source of money for technology (after district operating budgets)
- About 95 percent of districts have a formal technology plan that includes a program for training teachers and integrating technology into the curriculum
- Students have access to approximately 163,000 computers, or one computer for every five students
- About 42 percent of these computers are considered “networkable”, i.e., purchased after 1994
- Overall, there is about one “networkable” computer for about every 13 students
- Just under two-thirds (64%) of classrooms have Internet access
- Districts with higher per-pupil property assessments are likely to spend more per student than those with lower per-pupil property assessments
- Training, and time for training emerged from the survey results as the two most pressing issues related to the effective use of technology in the classroom

Funding

One of the target questions of the Technology Alliance survey was how much money is spent currently on technology by schools districts. Results show that 1997-98 technology expenditures in the responding districts total approximately \$107 million. If pro-rated to all 296 districts, this figure would total about \$132 million, or about \$133 per student. Findings suggest, however, that few schools are in a “fully funded” position and spending varies dramatically—from a low of about \$5 per student in Cle Elum-Roslyn, to a high of \$650 per student in Brinnon.

Findings from the survey also reveal that no single source of money provides the majority of funds for technology-related expenses in schools. While the largest source of funding—about 43 percent—comes from district operating budgets, bonds and levies also play a vital role; just under one-third (30%) of all districts’ technology monies come from bonds and levies. In fact, bonds and levies passed in fiscal year 1997-98 will provide an additional \$204 per student in the affected district over the life of the bond/levy.

Sources of Technology Funding



A key problem with this type of funding, however, is the fact that capital bonds and levies have major limitations as funding sources, and not all districts are or can be successful at passing them. For example, in the past five years, 26 districts, representing 14 percent of students, have failed at all attempts at passing a levy.

Nearly all of these “non-passing” districts are small (only four have student populations greater than 10,000) and most have slightly lower than average property assessment values—\$324,000 compared to about \$356,000 statewide. Yet, one of the most noteworthy characteristics of these districts is the fact that they spend, on average, less per student per year than those that have been successful at passing a bond or levy, \$101 versus \$133.

Technology Plans

What we know from practice is that costs of integrating technology as an effective learning tool are far greater than what schools can currently spend. Many components add to the cost of getting up-to-date technology and training into classrooms. Among the most obvious are hardware and software costs; connections within schools and to the Internet; the initial training and long-term support of teachers; and infrastructure improvements. The difficulty, however, is arriving at reliable estimates of what it will cost to meet such goals.

To this end, the State of Washington requires that each district submit a technology plan that outlines needs and the estimated costs of how schools will be ultimately outfitted. At the time of this reporting, 216 of the 227 responding districts have submitted such plans to OSPI.

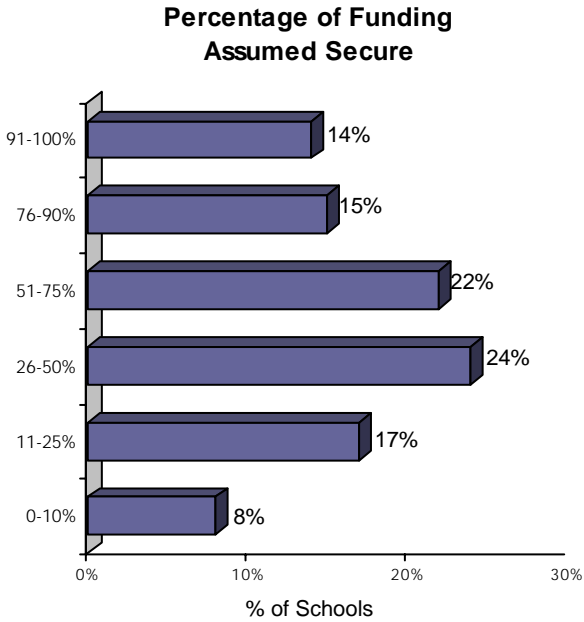
While some districts have submitted plans based on full needs, others included only those program elements with *guaranteed* funding. This implies that costs projected on a per-student basis vary widely; from a low of approximately \$2 per student *per year*, to a high of \$5,000 per student year over the plan's targeted time frame. Nevertheless, of the districts that have submitted a technology plan:

95% have a program aimed at training teachers in the use of technology

97% have a program to assist teachers with integrating technology into the curriculum

64% include a 5-year depreciation and replacement program for equipment

If fully implemented, combined costs of these technology plans total approximately \$604 million to be spent over the next four years, or about \$759 per student. However, as the graph shows, less than 14 percent of districts assume a full level of funding to implement their technology plans (see graph).



Hardware

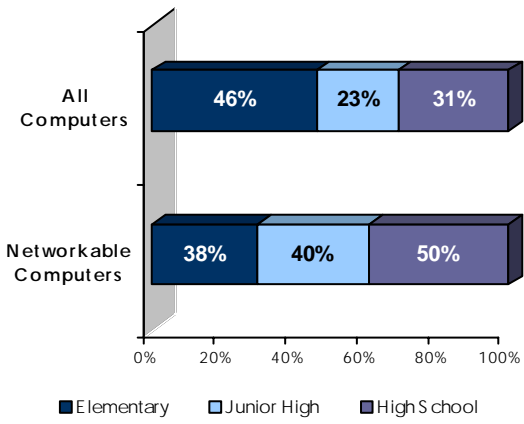
To make technology a viable instructional tool requires schools to have enough computers available to all students. Across the State of Washington, students face a ratio of one computer for every five students, or about 200,000 computers.

Integrating technology fully into students' learning experiences, also requires a high density of multimedia computers able to run the latest software or access the Internet—ideally a 1-to-5 ratio of student-to-“networkable” computer (equipment purchased after 1994).

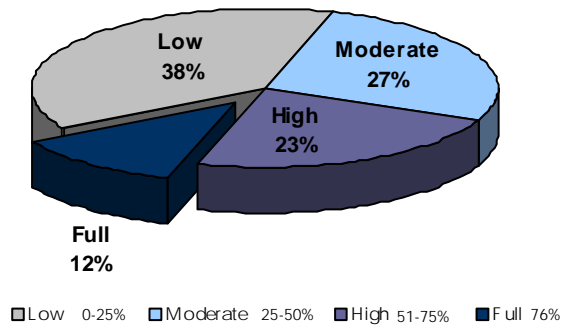
The majority of computers in Washington schools, however, comprises of computers with fewer of these capabilities; about 42 percent have features that allow for network access. By grade level, this translates into a ratio of; one networkable computer for every 11 high school students; one networkable computer for 13 junior high school students; and one networkable computer for 14 elementary school students.

Breaking the survey results down further reveals that, although more than one-third of the districts have a relatively low level of networkable computers (38%), these districts represent approximately 28 percent of all students, whereas districts with a moderate level of networkable computers represent nearly one-third of the state's students. In addition, combined high and full districts represents about 40 percent of the state's students. Nevertheless, seven districts (representing 3 percent of the students) have no networkable computers.

Distribution of Computers by Grade Level



Level of Networkable Computers in Schools



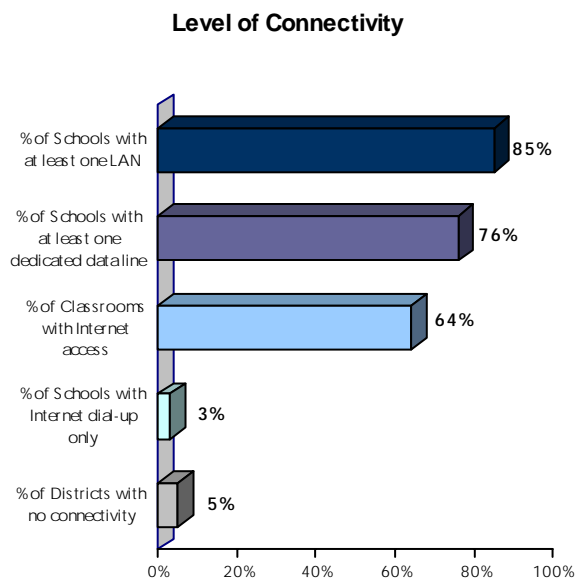
Connectivity

Schools in Washington are well connected; about 64% of the classrooms in the responding districts have Internet access, and 38% of the districts report having Internet access in **all** of their classrooms.

Other types of connectivity include dedicated data lines and Internet dial-up. While the use of these tools continues to fall as they are replaced with direct Internet access, they provide smaller districts, and districts with less funds dedicated to technology with a cost effective way of integrating technology into the curriculum.

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Equity

Identifying funding sources, expenditures and technology demographics provides a framework with which to gauge how technology is distributed across the state's schools. It does not, however, show how equitable the distribution is. Studies suggest that many schools with large concentrations of low-income students are less likely to have access to computers and are less likely to have access to the Internet.

One of the goals of the Technology Alliance survey was to determine if any such inequities exist in Washington schools. To do so, a number of correlation studies were performed, measuring if any relationships emerged between poverty levels² and spending per student, or poverty levels and connectivity in school districts within the state.

While the graph below suggests that levels of connectivity and spending are higher in schools with "less poverty," no *statistically* significant relationship was actually observed.

It is important to note the fact that participation in a reduced or school lunch program is highly correlated with per-pupil property assessments. This is to say that students from households with lower incomes (hence, higher rates of program participation) are more likely to live in areas where property values are lower. Hence, the apparent pattern depicted in the graph reveals the spurious relationship that exists between school lunch program participation and the level connectivity, without controlling for the influence of per student property assessment.

Given this premise, when the level of per-pupil property assessment was correlated with *spending*, a positive relationship did emerge. In other words, one could expect that schools with a lower property assessment base will spend less per student than those districts with a higher assessment.

These findings, however, are inconclusive as to which budget items technology dollars are allocated. No assumption can be made regarding *the level* of connectivity and per student spending; higher per student expenditures do not automatically mean a higher level of Internet connection, for example. While there is something to be said about the efficiency and efficacy in the use of funding, schools invariably are at different stages of upgrading infrastructure. Likewise districts may place more emphasis on program elements that are harder to quantify than hardware and connections.

Such is the case with Seattle, where school districts dedicate a larger portion of technology funds to professional and staff development. Also, costs of implementing technology may vary substantially depending on the area of the state or even the type of building structure involved; some schools may face lower labor costs, others benefit from economies of scale etc.

The conclusion to reach from these correlations, therefore, is how tax dollars are distributed among schools, not how dollars are spent within them.

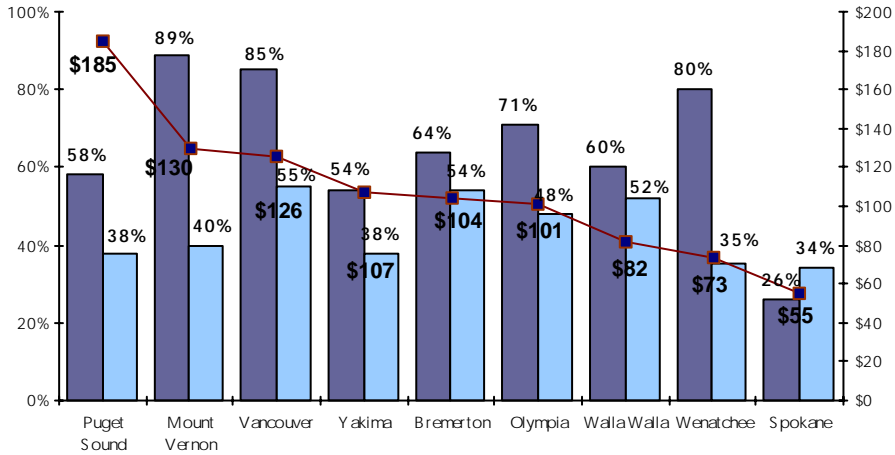
² ***Defined either as the percentage of students participating in a reduced or free lunch program, or the district average per-pupil property assessment***

AREA	ESD #	ASSESSED PROPERTY PER PUPIL	ANNUAL SPENDING PER PUPIL
Yakima	105	\$194,505.29	\$107
Wenatchee	171	\$241,360.68	\$73
Walla Walla	123	\$246,676.58	\$82
Spokane	101	\$256,461.40	\$55
Olympia	113	\$267,605.04	\$101
Bremerton	114	\$331,141.13	\$104
Vancouver	112	\$335,189.38	\$126
Puget Sound	121	\$427,742.39	\$185
Mount Vernon	189	\$513,958.40	\$130
STATE WIDE AVERAGE		\$337,584.00	\$133

% of networkable Computers in Schools

% of Classrooms with Internet access

\$ spent per student per year



Pressing Issues

While funding for equipment remains the number one barrier to widespread use of technology, educators face a variety of challenges than just acquiring linkages. Upgrading teacher training is key to integrating technology into the classroom and to increasing student learning. In fact, when the Technology Alliance asked what were the most pressing issues related to the effective use of technology in the classroom, one key finding indicated that school districts *lack the time* and resources to train and provide professional development to teachers (and other educational staff).

Another issue highlighted by the survey is that teachers who do have training, and use computers in the classroom, often *lack the technical support* to maintain or repair their teaching tools. Almost one-third of districts have no official maintenance plan or staff in place. Computers become effective instructional tools only if they are readily accessible to students and teachers *and* well maintained. Despite the fact that schools most commonly have access to a *district level* support person who services several schools, only 2 percent of the districts have at least a part-time technical support person in each school; most maintenance and repair, therefore is done by teachers, staff or students on their own time. As a result, only 14 percent of the state's school districts can meet a "down-time" of two days or less.

Success Stories

The **Lake Washington School District** formed a foundation to help process and distribute donated equipment among students who score in the lower 25 percentile of the state's 4th grade assessment test. The program allows for computers to be set up in the student's home, and equipped with a modem and an Internet account (at no cost to the family). By exposing and providing access to topics of interest, the program helps motivate children to read and improve writing skills.

The **Lake Washington School District** also wrote and received a grant—from GTE, Compaq and Microsoft—to form a resource center that provides free basic computer and Internet training three nights a week to the community.

In November 1997, **Pe Ell School District** participated in an international environment forum to study recycling. The program involved a video conference in which four high school students participated, along with students from Finland, New Zealand and Japan.

Snohomish School District successfully implemented a laptop program that allows students to have access to technology at anytime. The program has created a vital link between parents, schools, businesses, and the community to provide technology as a toolbox for learning opportunities in a personalized way. Currently there are more than 630 students, grades 5-7, involved in this program. The program will be expanded to the 8th and 9th grade for next year.

Over the past three years, **Freeman School District** has been able to carve out between \$50,000-\$75,000 from the operating budget to provide a solid technology presence in the district. These efforts won the confidence of citizens and allowed us to pass a \$915,000, five-year technology bond in February 1998. Coupled with the \$70,000 a year from M&D funds, there is approximately \$2,000,000 to spend on 900 kids over 5 years—this does not include e-rate discounts.