Summary of Statewide Results

from the

2001 California School Technology Survey

California Department of Education

and the

California Technology Assistance Project

September 2001

TABLE OF CONTENTS

Introduction 1

Highlights from California Statewide Results..... 2

I. Equipment 4

1.1 Statewide/Regional Measures
1.2 Estimates of Age of Current Computer Inventory

II. Connectivity 5

2.1 Statewide/Regional Measures
2.2 School Measures

III. Technical Support 6

3.1 Certificated FTE Personnel
3.2 Estimated Repair & Support Response Time

IV. Curriculum Support 7

4.1 Certificated FTE Personnel
4.2 Classified FTE Personnel

V. Technology Planning & Use 8

5.1 Technology Planning
5.2 Reported Frequency of Technology Use by Content Area

VI. Faculty/Staff Profile 9

6.1 Teacher Proficiency (Relative Distribution)
6.2 Teacher Proficiency (per 100 Students)

VII. Access by Eligibility for Free and Reduced Price Meals 10

7.1 Student to Multimedia Computer Ratio by Eligibility for Free and Reduced Price Meals
7.2 Percent of Classrooms Connected to the Internet by Eligibility for Free and Reduced Price Meals

Introduction

In early 2001, the California Department of Education in conjunction with the California Technology Assistance Project (CTAP) began a statewide data collection activity designed to assess the education technology resources in K-12 public schools. An online survey instrument was created and each school in California was asked to report information on the amount and type of technology available, as well as information on how technology is used at the site, how well prepared teachers are to use technology, and the level of technology support available to the school. So that valid regional and statewide results could be reported, a random stratified sample of elementary, middle, and high schools was selected. Throughout the spring of 2001, CTAP provided technical assistance to schools completing the survey and worked to ensure that a sufficient number of schools in the random sample submitted data. In all, data was collected from 2,380 schools in the random sample (81 percent of the random sample) and a total of 6,563 schools (71 percent of all schools).

This summary of results includes information on the Internet connectivity; available hardware, including the student-to-computer ratio and the student-to-multimedia-computer ratio (a multimedia computer is a recent-generation machine designed to run modern software titles and access the graphics-intensive World Wide Web portion of the Internet); technical support; curriculum support; technology planning and use; and faculty and staff proficiencies. A similar data collection effort was conducted in 2000 using a paper survey. When possible, results from the 2001 survey have been compared with the 2000 survey. Dr. Donald Tetreault, under contract with the Los Angeles County Office of Education, completed the data analysis contained in this report and contributed to this summary on behalf of CTAP and the California Department of Education. His contribution to this effort is gratefully acknowledged. When considered in aggregate, these data present a complex, yet compelling, portrait of educational technologies in California's public schools.

In the last few years, as schools have acquired more computers, and high-speed connections to the Internet have become more common, new challenges and obstacles have arisen. While there is a critical need for trained technicians to repair and maintain computer equipment in schools; system and network administration staff are often lured away from public schools by higher paying jobs in the corporate sector; and although teachers are rapidly developing basic computer competencies, many are still learning about ways to integrate technology into the curriculum in order to impact student learning. We have come a long way, but we recognize there remains a greater set of challenges before us.

Highlights from the **CALIFORNIA STATEWIDE RESULTS**

	2000	2001
Schools connected to the Internet	**80%**	**90%**
Classrooms connected to the Internet	**58%**	**77%**
Student/Computer Ratio	**6.97**	**6.37**
Student/Multimedia Computer Ratio	**9.51**	**8.24**

	Elementary Schools	Middle and Junior High Schools	High Schools
Schools connected to the Internet			
• 2000	**78%**	**85%**	**82%**
• 2001	**89%**	**93%**	**93%**
Classrooms connected to the Internet			
• 2000	**53%**	**60%**	**67%**
• 2001	**72%**	**76%**	**88%**
Student/Computer Ratio			
• 2000	**7.57**	**6.27**	**6.41**
• 2001	**6.96**	**6.29**	**5.51**
Student/Multimedia Computer Ratio			
• 2000	**10.59**	**9.51**	**7.93**
• 2001	**9.49**	**8.14**	**6.61**

2001 California School Technology Survey - Regional Comparison

	CA	Region 1	2	3	4	5	6	7	8	9	10	11
Connectivity												
Schools												
• 2000	**80%**	**85%**	**79%**	**84%**	**81%**	**88%**	**69%**	**79%**	**74%**	**86%**	**85%**	**89%**
• 2001	**90%**	**87%**	**88%**	**89%**	**91%**	**93%**	**83%**	**95%**	**90%**	**94%**	**92%**	**88%**
Classrooms												
• 2000	**58%**	**65%**	**81%**	**65%**	**73%**	**77%**	**62%**	**70%**	**67%**	**67%**	**63%**	**34%**
• 2001	**77%**	**86%**	**100%**	**78%**	**81%**	**89%**	**74%**	**94%**	**93%**	**83%**	**82%**	**58%**
Computer Access												
Students/Computer												
• 2000	**6.97**	**6.48**	**5.15**	**6.01**	**5.77**	**6.57**	**7.44**	**6.64**	**5.95**	**7.06**	**6.96**	**8.81**
• 2001	**6.37**	**5.84**	**3.84**	**5.25**	**6.03**	**5.78**	**6.66**	**5.49**	**5.57**	**6.47**	**6.53**	**7.54**
Students/MM Computer												
• 2000	**9.51**	**8.99**	**6.30**	**7.89**	**9.15**	**8.57**	**11.21**	**8.84**	**7.70**	**8.87**	**9.09**	**12.12**
• 2001	**8.24**	**7.63**	**4.66**	**7.13**	**7.64**	**7.44**	**11.65**	**6.96**	**6.77**	**7.89**	**8.62**	**9.72**

Counties included in CTAP's eleven service regions

- **1** • Del Norte, Humboldt, Lake, Mendocino, Sonoma
- **2** • Butte, Glen, Lassen, Modoc, Plumas, Shasta, Siskiyou, Tehama, Trinity
- **3** • Alpine, Colusa, El Dorado, Nevada, Placer, Sacramento, Sierra, Sutter, Yolo, Yuba
- **4** • Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Solano
- **5** • Monterey, San Benito, Santa Clara, Santa Cruz
- **6** • Amador, Calaveras, San Joaquin, Stanislaus, Tuolumne
- **7** • Fresno, Kings, Madera, Mariposa, Merced, Tulare
- **8** • Kern, San Luis Obispo, Santa Barbara, Ventura
- **9** • Imperial, Orange, San Diego
- **10** • Inyo, Mono, Riverside, San Bernardino
- **11** • Los Angeles

I. EQUIPMENT

Student/Computer Ratios

For the most part, national attention has focused on the student-to-computer ratio as a measure of student access. As it is typically reported, this measurement considers the total number of students and the total number of computers within a specified geographic region or grouping of schools/districts. For example, a state with 640,000 K-12 school children and 80,000 school computers would yield a student/computer ratio of 8.0. This is important information, but it does not yield a complete portrait of student access to technology.

In this summary we also make a distinction between different types of computers based upon their complexity and degree of connectivity. The following abbreviations are used to represent survey information gathered about the different types of computers found in schools:

- **Computers** • Includes all computers reported in the survey
- **MM** • Multimedia Computers
- **IC** • Internet-Capable Multimedia Computers
- **CIC** • Connected Internet-Capable Multimedia Computers

Table 1.1 reports student access to computers based on the random sample's representation of the total number of students, and the total number of computers, within the state.

TABLE 1.1 Equipment - Statewide Measures

	CA
Students/Computer	6.37
Students/MM Computer	8.24
Students/IC Computer	8.84
Students/CIC Computer	10.43
MM as a percent of all computers	77%

Table 1.2 presents estimates of the age of the current inventory of computers in schools. The values presented below are averages of estimates gathered at each school.

TABLE 1.2 Equipment - Estimates of Age of Current Computer Inventory[1]

	CA
Less than 1 year old	17%
Between 1 and 4 years old	44%
More than 4 years old	39%

II. CONNECTIVITY

Connectivity is a critical component of school technology. Connectivity refers to the degree of telecommunications infrastructure present in schools, and the ability of schools to use that infrastructure to share information, access various instructional resources electronically, and access the Internet. The data was collected on the number of schools and classrooms with "dedicated, non-dial up" Internet connections. Table 2.1 reports Internet connectivity based on the random sample's total number of connected schools and classrooms within the state or CTAP region.

TABLE 2.1 Internet Connectivity - Statewide Measures

	CA
Schools	90%
Classrooms	77%

Table 2.2 reports classroom Internet connectivity based on the average connectivity measured at each school in the random sample.

TABLE 2.2 Internet Connectivity - School Measures

	CA
Schools with No Classrooms Connected	14%
Schools with All Classrooms Connected	53%

[1] May not add up to 100% since these are averages of values reported by individual schools.

III. TECHNICAL SUPPORT

From the time computers began making their way into classrooms, it has been necessary to support and maintain them. As the number of computers in a school has grown, the issue of technical support has become increasingly important to schools.

Additional demands to network computers and help teachers integrate this system into instruction has led many schools and districts to create new technology-related positions. In order to look at the total cost of ownership for computers and information systems in schools, it is important to look at all the internal and external support positions and contracts that schools have determined are necessary to establish and maintain computer technology.

In addition to presenting data on the absolute number of technical support personnel, we also present personnel numbers per 100 students, teachers, and computers. The purpose of selecting "100" as a measurement unit is not to set a desirable policy "target." To be sure, it is difficult to determine exactly how many students, teachers, or computers that can be adequately serviced by support personnel. Rather, by standardizing personnel measurement through the use of a common denominator (i.e., "per 100" of some unit), we can track progress from year to year, and make cross-school comparisons, despite enrollment differences between schools, or enrollment changes in the same school from year to year. Table 3.1 reports the numbers of certificated personnel responsible for providing technical support.

TABLE 3.1 Technical Support - Average Number of Certificated FTE Personnel per School

	CA
School-Site Resource Teachers (RT)	0.16
RT/100 Students	0.03
RT/100 Teachers	0.47
RT/100 Computers	0.16
Percent of schools with No certificated RT	71%
School-Site Network Staff (NS)	0.04
NS/100 Students	0.00
NS/100 Teachers	0.09
NS/100 Computers	0.03
Percent of schools with No certificated NS	91%

Survey respondents were also asked to estimate the time for support staff to respond to their needs. Although there is no universal minimum or maximum acceptable response time, it makes sense that response times should be minimized, since non-functioning equipment cannot impact student learning. Response time values may reflect the adequacy of the number of staff available, or the skill level of support providers (i.e., low-skilled technicians may spend more time resolving each support issue). Table 3.2 reports estimated response times for repair and support.

TABLE 3.2 - Estimated Repair and Support Response Time

	2 hrs	1 day	2-5 days	1 wk	1 month
Hardware Repair Time	2%	9%	46%	32%	11%
Support Response Time	11%	26%	43%	16%	4%

IV. CURRICULUM SUPPORT

Support and training for the integration of computer technologies into daily lesson planning has emerged as a critical area in recent years. Most experts agree that, while acquiring hardware and connectivity is a necessary first step, computers will have little impact on students unless teachers become skilled in using them to challenge students, deliver content, and reinforce important concepts.

Tables 4.1 and 4.2 report numbers of certificated and classified personnel at each school responsible for providing support and training for curricular integration of educational technologies.

TABLE 4.1 Curriculum Support - Average Number of Certificated FTE Personnel per School

	CA
Staff Development Coordinator	0.14
Technology Resource Teacher	0.16
Other	0.06
Total	0.36
Percent of schools with NO Certificated curriculum support personnel	47%

TABLE 4.2 Curriculum Support - Average Number of Classified FTE Personnel per School

	CA
Staff Development Coordinator	0.03
Technology Resource Teacher	0.08
Other	0.03
Total	0.14
Percent of schools with NO Classified curriculum support personnel	79%

V. TECHNOLOGY PLANNING & USE

Technology planning is the necessary first step toward the effective use of computers in classrooms. Table 5.1 provides data on district and school technology plans and their coordination.

TABLE 5.1 Technology Planning

	Yes
District Technology Plan	95%
School Technology Plan	77%
School & District Tech Plan coordinated	64%

Anecdotal accounts and small-scale case studies provide a great deal of insight about the uses of computer technologies in classrooms. There have been, however, few large-scale studies documenting the detailed and specific practices of teachers and their use of computers. Such research is time and labor-intensive.

Here, we attempt to provide some insight regarding the beliefs and practices of teachers, with the caveat that our data has limitations. For example, the school-level values we report are likely to reflect the input of only one or several individuals at a school, rather than the sum of responses from all teachers in each school. Still, this information can be of value to policymakers in identifying areas that merit further research. Table 5.2 reports the average school-level frequency of technology use by content area.[2]

TABLE 5.2 Reported Frequency of Technology Use by Content Area

	Daily	2-5 Days/Wk	Once/Wk	Once/Mo	Never
Reading/Language Arts	39%	32%	24%	3%	1%
Mathematics	27%	35%	28%	8%	2%
Science	12%	25%	41%	18%	4%
History	12%	25%	43%	18%	3%

[2] Numbers may not add up to 100 percent due to rounding.

VI. FACULTY/STAFF PROFILE

This section reports data on teacher and administrator skills in the use of educational technologies. Survey respondents provided information based on a set of definitions characterizing school staff abilities in the use of educational technologies.

Novice	•	No familiarity or comfort with the use of a computer
Introductory	•	Navigates the desktop; reads and sends e-mail & attachments; has a basic working knowledge of word processing; navigates the Web with a browser
Intermediate	•	Actively manages the desktop; competently uses word processing and spreadsheet software; uses search engines; downloads & opens files from the web; custom configures browser software
Proficient	•	Selects & implements technology resources appropriately into lesson design; custom manages the desktop & software applications; installs & upgrades software; troubleshoots software conflicts & system crashes; uses an html editor to format web pages

Survey respondents provided the absolute number of personnel in each of the four categories. This enabled the calculation of the relative distribution of personnel within each category, as well as the raw number of personnel per common unit of measurement (such as personnel per 100 students). Once again, we highlight the utility of using the measurement standard of "per 100 students" to enable cross-school comparisons and track changes over time. Data were collected for administrators, teachers, and support staff.

Table 6.1 reports the relative distribution of teachers with varying degrees of skill in the use of technology.[3]

TABLE 6.1 Relative Distribution of Teacher Proficiency per School

	CA
Novice	12%
Introductory	40%
Intermediate	35%
Proficient	13%

Table 6.2 reports the number of teachers with varying degrees of skill per 100 students. The numbers reported here are the averages of values measured at each school in the random sample.

TABLE 6.2 Average Number of Teachers at Various Proficiency Levels per School

	CA
Novice/100 Students	0.62
Introductory/100 Students	1.97
Intermediate/100 Students	1.75
Proficient/100 Students	0.70

[3] Numbers reported here are the averages of relative distribution values measured at each school, and may not add up to 100%.

VII. ACCESS BY ELIGIBILITY FOR FREE AND REDUCED PRICE MEALS

This section reports data on the student to multimedia computer ratio and connectivity by the percent of students eligible for free or reduced price meals from the National School Lunch Program. This analysis is provided as a measure of the "Digital Divide" in California schools. Nationally, attention has been focused on the Digital Divide and the question as to whether or not all groups of students have equal access to hardware and Internet connectivity in schools. Table 7.1 presents data on the students to multimedia computer by free and reduced price meal eligibility.

TABLE 7.1 Students to Multimedia Computer by Eligibility for Free and Reduced Price Meals

Schools with	CA
0-20% of Students Eligible	7.1
21% to 40% of Students Eligible	7.74
41% to 60% of Students Eligible	8.12
61% to 80% of Students Eligible	8.82
81% or More of Students Eligible	9.96

Table 7.2 displays Internet connectivity data by free and reduced price meal eligibility.

TABLE 7.2 Percent of Classrooms Connected to the Internet by Eligibility for Free and Reduced Price Meals

Schools with	CA
0-20% of Students Eligible	87%
21% to 40% of Students Eligible	80%
41% to 60% of Students Eligible	78%
61% to 80% of Students Eligible	73%
81% or More of Students Eligible	67%