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## Computer Technology in the Public School Classroom: Teacher Perspectives

In recent years, U.S. public school teachers have seen the level of education technology in their schools and classrooms increase substantially. From 1994 to 2002, the percentage of public schools with access to the Internet increased from 35 to 99 percent. Furthermore, in 2001–02, 87 percent of public schools with Internet access reported that professional development on how to integrate the use of the Internet into the curriculum was available to teachers (Kleiner and Lewis 2003).

Despite regular reports of increasing school-level access to computers and technology, little national-level data is available on teacher opinions regarding the availability and usefulness of the technology in their classrooms. This Issue Brief uses data from the 2000–01 Teacher Follow-up Survey (TFS) to examine teacher views on the technology in their classrooms.<sup>1</sup> Specifically, teachers reported which types of technology they considered essential for teaching and whether they felt such technology was sufficiently available in their classrooms.

### Which Types of Classroom Technology Do Teachers Consider To Be Essential?

In 2000–01, teachers reported on the types of technology—regardless of availability—they considered essential for teaching. Topping the list were types of technology that reached outside the classroom. A “teacher’s computer station with

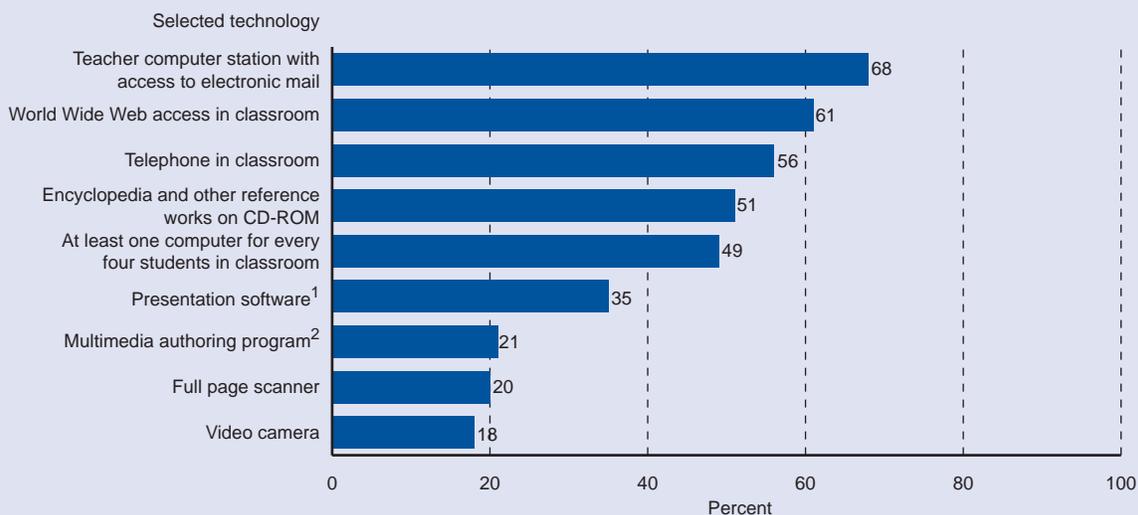
access to electronic mail” was most frequently reported as “essential” (68 percent; figure 1). Following e-mail, classroom access to the World Wide Web (61 percent), a telephone in the classroom (56 percent), encyclopedias and other reference materials on CD-ROM (51 percent), and the presence of at least one computer for every four students (49 percent) were the items most frequently reported as essential. Following those items, 35 percent of teachers reported presentation software (e.g., PowerPoint) as essential. The items least frequently reported as essential were multimedia authoring programs (e.g., HyperCard), full page scanners, and video cameras (21 percent, 20 percent, and 18 percent, respectively).

### Do Teachers Feel Technology Is Sufficiently Available in Their Classrooms?

Teachers also reported on the availability of technology in their classrooms. In 2000–01, a majority of teachers (57 percent) agreed with the statement “Computers and other technology for my classroom(s) were sufficiently available.” Of all teachers, 25 percent “strongly” agreed that this was the case. However, 35 percent of all teachers disagreed with the statement, including 15 percent who “strongly” disagreed (figure 2).

Teachers’ familiarity with computers was related to whether they agreed that classroom technology was sufficiently avail-

Figure 1. Percentage of teachers who believed selected technologies were essential to their teaching: 2000–01



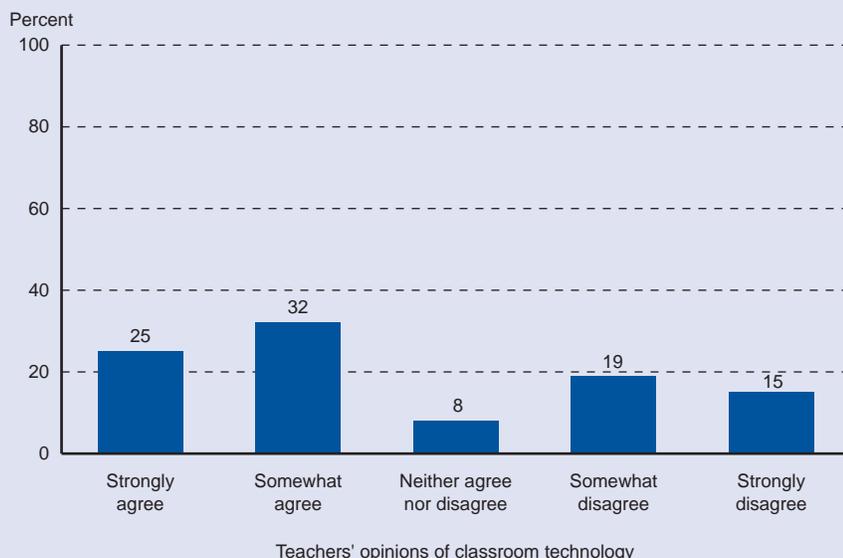
<sup>1</sup> Presentation software refers to software such as PowerPoint.

<sup>2</sup> Multimedia authoring program refers to software such as Hyperstudio or HyperCard.

NOTE: Standard errors are available at <http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2005083>.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Teacher Follow-up Survey (TFS), 2000–01, Questionnaire for Current Teachers.

**Figure 2. Percentage of teachers who agreed that computers and other technology for their classrooms were sufficiently available: 2000–01**



NOTE: Standard errors are available at <http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2005083>.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Teacher Follow-up Survey (TFS), 2000–01, Questionnaire for Current Teachers.

**Table 1. Percentage of teachers who agreed that computers and other technology for their classrooms were sufficiently available, by selected teacher characteristics: 2000–01**

Teacher characteristic	Agree <sup>1</sup>	Neither agree nor disagree	Disagree <sup>2</sup>
<b>Total</b>	<b>57</b>	<b>8</b>	<b>35</b>
<b>Main assignment</b>			
Pre-K, kindergarten, and general elementary	58	7	35
Mathematics and science	62	9	29
English/language arts	59	8	33
Social science	64	5 !	30
Special education	53	9	39
Foreign languages and bilingual/ESL	54	6 !	40
Vocational/technical	56	8 !	36
All others <sup>3</sup>	52	12	36
<b>Hours of professional development for computers</b>			
No professional development	47	10	43
Up to 16 hours	65	7	28
17 hours or more	61	8	32
<b>Agrees with "I am reasonably familiar and comfortable with using computers"</b>			
Strongly or somewhat agree	60	8	32
Neither agree nor disagree	53	14	33
Strongly or somewhat disagree	48	8	45
<b>Student-to-computer ratio<sup>4</sup></b>			
<b>With computers in classroom</b>			
Less than 4	69	8	23
4 to less than 8	67	6	27
8 to less than 16	62	3	35
16 or greater	55	5	40
<b>No computers in classroom</b>	<b>39</b>	<b>13 !</b>	<b>48</b>

<sup>1</sup> Interpret data with caution; estimates are unstable. The coefficient of variation is greater than 30 percent.

<sup>2</sup> Estimate combines those teachers who either "somewhat" agreed or "strongly" agreed that technology for their classrooms was sufficiently available.

<sup>3</sup> Estimate combines those teachers who either "somewhat" disagreed or "strongly" disagreed that technology for their classrooms was sufficiently available.

<sup>4</sup> Includes religion, philosophy, home economics, health, computer science, American Indian studies, military science, gifted programs, arts, physical education, remedial education, and others.

<sup>5</sup> The classroom student-to-computer ratio was calculated by dividing the number of students in one "typical" class, designated by the teacher within the main assignment, by the number of computers in the classroom where that designated class was taught. Teachers with no computers in the classroom were excluded from the calculation. Percentages are based on the 58 percent of teachers who reported that their students used computers during class time.

NOTE: Standard errors are available at <http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2005083>.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Teacher Follow-up Survey (TFS), 2000–01, Questionnaire for Current Teachers.

able. Of the teachers who considered themselves “reasonably familiar and comfortable with using computers,” 60 percent agreed that technology was sufficiently available in their classrooms, compared with 48 percent of those who did not report being “reasonably familiar and comfortable with using computers” (table 1). Also, teacher participation in technology-related professional development was related to views on classroom technology. Forty-seven percent of teachers who did not participate in this type of professional development agreed that classroom technology was sufficiently available, compared with 65 percent of teachers who had up to 16 hours and 61 percent of teachers who had 17 or more hours.

The presence of computers in the classroom was also related to teacher reports of sufficient availability of technology. Some 69 percent of teachers with a student-to-computer ratio of less than 4 agreed that classroom technology was sufficiently available. In contrast, 39 percent of teachers without classroom computers for students agreed that classroom technology was sufficiently available (table 1). In general, as the ratio of students to computers increased, teachers’ dissatisfaction with the available classroom technology increased.

## Conclusion

By presenting national data on teacher opinions on technology, this Issue Brief adds a new perspective to the literature on

the proliferation of education technology. In 2000–01, technologies that allowed teachers to communicate with others or access resources outside the classroom (e-mail, the World Wide Web, and telephone) were among the most frequently cited by teachers as being “essential” for their teaching. Most teachers reported that they found their classroom technology to be “sufficiently available.” However, teachers with relatively few computers in the classroom reported sufficient availability of technology less often than teachers with more computers.

## Endnote

<sup>1</sup> The TFS sampling frame consists of all eligible teachers who responded to the Schools and Staffing Survey (SASS) teacher questionnaires in 1999–2000. Analyses in this Issue Brief are based on data from the 4,153 public and charter school teachers in the 2000–01 TFS sample—a subsample of those 1999–2000 SASS respondents who continued teaching—representing a target population of 3.1 million teachers. All differences discussed in this Issue Brief are statistically significant at the .05 level as measured by two-tailed Student’s *t* tests. Bonferroni adjustments were made to control for multiple comparisons where appropriate.

## Reference

Kleiner, A., and Lewis, L. (2003). *Internet Access in U.S. Public Schools and Classrooms: 1994–2002* (NCES 2004–011). U.S. Department of Education. Washington, DC: National Center for Education Statistics.

The Issue Brief series presents information on education topics of current interest. All estimates shown are based on samples and are subject to sampling variability. All differences are statistically significant at the .05 level. In the design, conduct, and data processing of National Center for Education Statistics (NCES) surveys, efforts are made to minimize the effects of nonsampling errors, such as item nonresponse, measurement error, data processing error, or other systematic error. For more information on the Teacher Follow-up Survey, visit <http://nces.ed.gov/surveys/SASS/OVERVIEW.ASP#whatstfs>.

This Issue Brief was authored by Lawrence Lanahan and Janet Boysen of the Education Statistics Services Institute (ESSI) and was formatted by Carol Rohr of Pinkerton Computer Consultants, Inc. For further information, contact Edith McArthur, NCES, at 202-502-7393 or [Edith.McArthur@ed.gov](mailto:Edith.McArthur@ed.gov). To order additional copies of this Issue Brief or other NCES publications, call 1-877-4ED-Pubs or visit <http://www.edpubs.org>. NCES publications are also available on the Internet at <http://nces.ed.gov>.