

# 2011 Census of Technology

Missouri Schools K-12



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# Overview

The Census of Technology (COT) is designed to assess Missouri's continuing investment in K-12 education technologies. The COT provides important data for the Department of Elementary and Secondary Education (DESE) to share with state and national decision-makers to help advance public policy and increase public awareness and support for education technology. The COT provides local school districts with data to help identify local needs, develop strategies to facilitate school improvement processes and compare district progress with statewide data.

The COT items are aligned with the Missouri Education Technology Strategic Plan (METSP), the Missouri School Improvement Program (MSIP), the National Educational Technology Plan and the National Educational Technology Standards (NETS). The census is a primary data source for measuring progress toward meeting state goals and objectives.

Despite the challenging economy, the 2010-11 COT data show school districts in Missouri continue to make gains in ensuring their students are exposed to technological tools useful in developing the skills necessary for successful entry into the 21st century work force.

With the implementation of a new streamlined data collection tool, this year's census was shortened to three questions for the district and seven questions for each building. Prior to the 2010-11 census, districts responded to 11 questions about their district technologies and 17 questions about the technologies in the

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individual buildings. (See [dese.mo.gov/divimprove/instrtech/](http://dese.mo.gov/divimprove/instrtech/) for more information about the changes to the COT.)

With the rollout of its new Missouri Comprehensive Data System portal in 2011, the Department has developed a tool that allows school personnel and the public to access education-related data. This COT report is among the first reports to utilize the portal system.

# Internet access

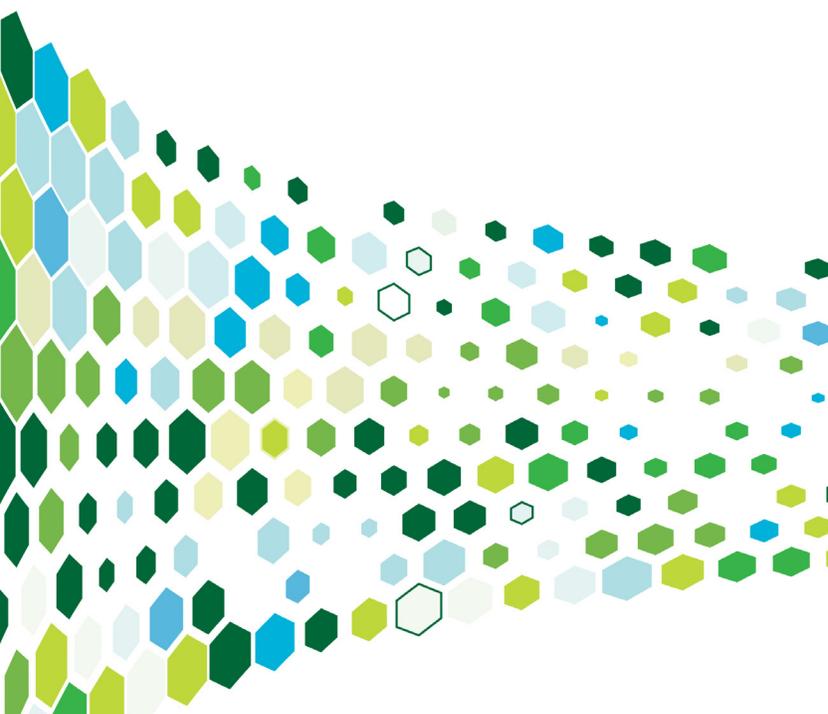
## Internet connectivity

In Missouri, 93 percent of school buildings have T1 Internet connectivity or higher. The majority of buildings have fiber connections as their main distribution system.

BANDWIDTH	PERCENT	
	2006	2011
56kb – 384 kb	2%	>1%
385kb – 1.4mb	56%	2%
1.5mb (T1) – 9.9mb	19%	39%
10mb – 45mb	6%	28%
45mb – 100mb	7%	16%
>100mb	8%	17%
None	<1%	

DELIVERY MODE	PERCENT	
	2006	2011
Copper line	35%	16%
Fiber	50%	72%
DSL	3%	6%
Satellite	<1%	1%
Other	9%	4%

Eighty-four percent (472) of public school districts in Missouri rely on MOREnet as the main provider for Internet access (*MOREnet, January 2012*). As technology is increasingly incorporated into classrooms and school districts, it is anticipated that the need for bandwidth capacity will continue to rise in the near future.



# Access to technology

In 2010-11, a total of 405,992 computers (desktops, laptops and handhelds) were located in school buildings, with 380,724 (94 percent) located in instructional rooms, of which 232,160 (57 percent) were in classrooms; 117,623 (29 percent) in computer labs; and 30,941 (8 percent) in library media centers.

Table 1 shows this data by age of computer, location and number of Internet connections.

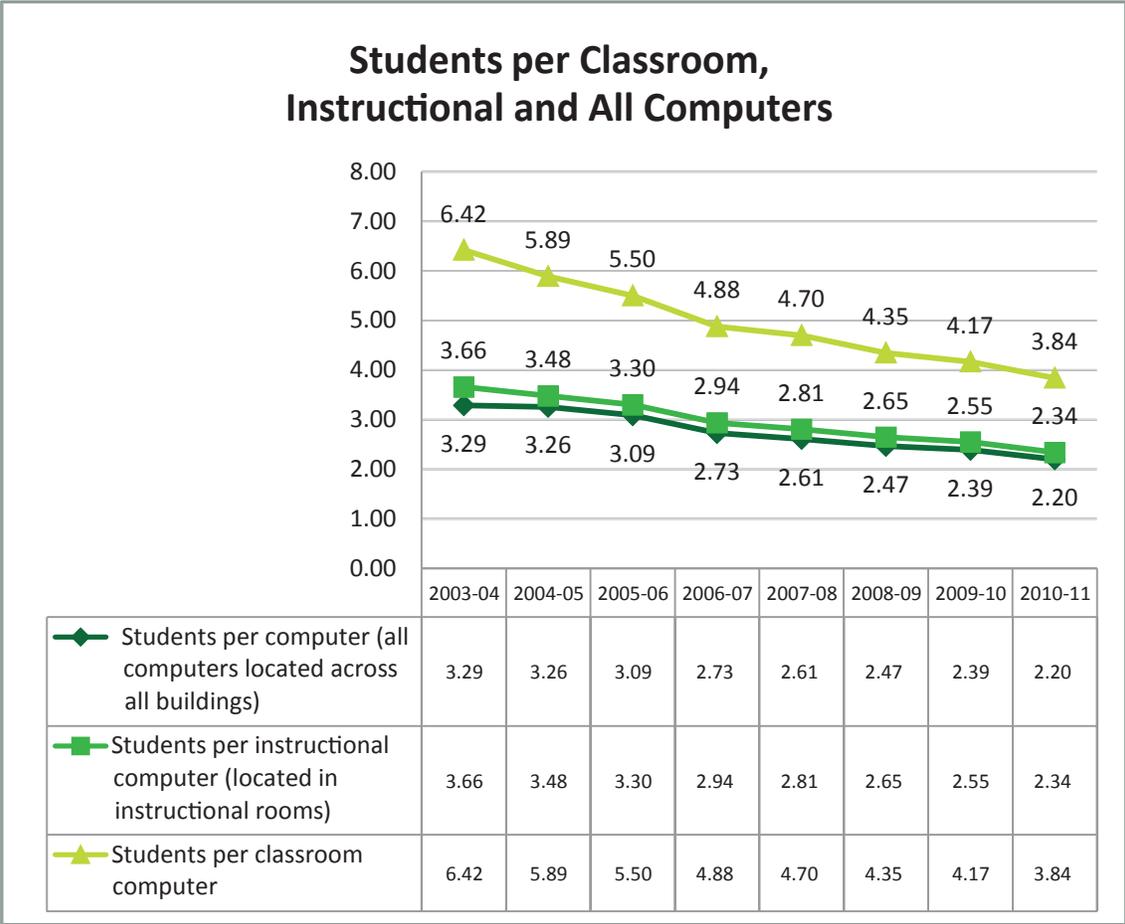
**Table 1**

2010-11

Age of Computer	Instructional Rooms						Library/ Media Centers	Administrative Offices	Total
	Computer Labs	Classrooms				Area Career Centers			
		PreK-2	3-5	6-8	9-12				
APPLE/MAC									
Under 1 Year – TOTAL	1,519	293	389	840	729	102	327	324	4,523
# Internet-connected	1,394	293	389	840	727	102	298	325	4,368
1 to 3 Years – TOTAL	6,265	2,254	3,306	3,759	3,835	373	2,644	796	23,232
# Internet-connected	6,232	2,200	3,250	3,737	3,745	373	2,587	794	22,918
4 to 5 years – TOTAL	2,893	923	888	1,478	1,391	103	282	191	8,149
# Internet-connected	2,883	905	886	1,472	1,350	103	247	189	8,035
6 Years or More – TOTAL	1,392	1,210	869	1,040	1,057	53	951	123	6,695
# Internet-connected	1,339	1,111	810	936	983	36	930	116	6,261
MAC sub-total	12,069	4,680	5,452	7,117	7,012	631	4,204	1,434	42,599
MAC # Internet- connected sub-total	11,848	4,509	5,335	6,985	6,805	614	4,062	1,424	41,582
PC COMPATIBLE									
Under 1 Year – TOTAL	14,746	4,497	6,543	5,763	9,571	871	4,136	2,611	48,738
# Internet-connected	14,564	4,455	6,218	5,301	9,519	860	4,106	2,564	47,587
1 to 3 Years – TOTAL	49,877	11,846	18,987	18,741	31,229	4,355	10,740	10,204	155,979
# Internet-connected	48,761	11,583	18,770	18,516	30,901	4,270	10,578	9,998	153,377
4 to 5 Years – TOTAL	27,632	9,570	12,977	11,891	17,144	2,529	7,428	6,424	95,595
# Internet-connected	27,037	9,378	12,870	11,489	16,709	2,326	7,296	6,166	93,271
6 Years or More TOTAL	12,230	7,610	9,169	7,207	8,894	1,100	3,737	3,566	53,513
# Internet-connected	11,807	7,229	8,805	6,855	7,426	1,042	3,579	3,182	49,925
PC sub-total	104,485	33,523	47,676	43,602	66,838	8,855	26,041	22,805	353,825
PC # Internet- connected subtotal	102,169	32,645	46,663	42,161	64,555	8,498	25,559	21,910	344,160
HANDHELDS									
Subtotal	1,069	1,035	2,352	1,568	1,482	337	696	1,029	9,568
# Internet-connected	732	327	677	571	1,062	74	259	758	4,460
TOTAL DEVICES	117,623	39,238	55,480	52,287	75,332	9,823	30,941	25,268	201,275
# Internet-connected	114,749	37,481	52,675	49,717	72,422	9,186	29,880	24,092	390,202

Figure 1 shows the students-per-computer ratio and how it has improved through the years.

Figure 1



Many of the classrooms in Missouri schools contain more technology than just computers. A multimedia computer with an Internet connection, a printer and a dedicated projection device is slowly becoming the norm for many classrooms across the state. Table 2 shows how those computers and other technologies are distributed throughout the schools.

**Table 2**

2010-11

	Instructional Rooms						Library/ Media Centers	Admin Offices	Total Overall
	Computer Labs	Classrooms							
		PreK-2	3-5	6-8	9-12	ACC			
TOTAL NUMBER ROOMS	4,180	13,840	13,211	14,011	18,652	1,650	2,305	14,148	81,997
With telephone access	3,070	9,664	9,291	9,866	13,705	1,238	2,098	13,837	62,769
With Internet access (wired or wireless)	4,368	13,762	13,188	13,865	18,315	1,582	2,286	13,952	81,318
With one or more multimedia-equipped computers	4,062	13,356	12,790	13,548	17,616	1,501	2,173	12,922	77,968
With one or more multimedia-equipped computers connected to Internet	4,080	13,258	12,630	13,494	17,538	1,462	2,159	12,568	77,189
With one or more multimedia-equipped and Internet-connected computers and access to a printer, and a dedicated projection device	3,372	10,572	11,008	10,904	13,615	941	1,691	2,908	55,011

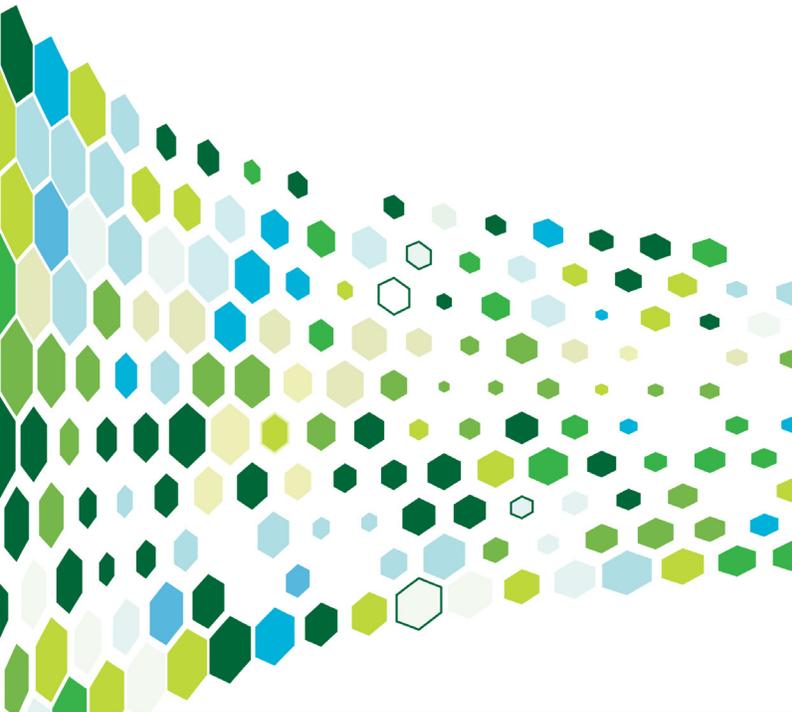
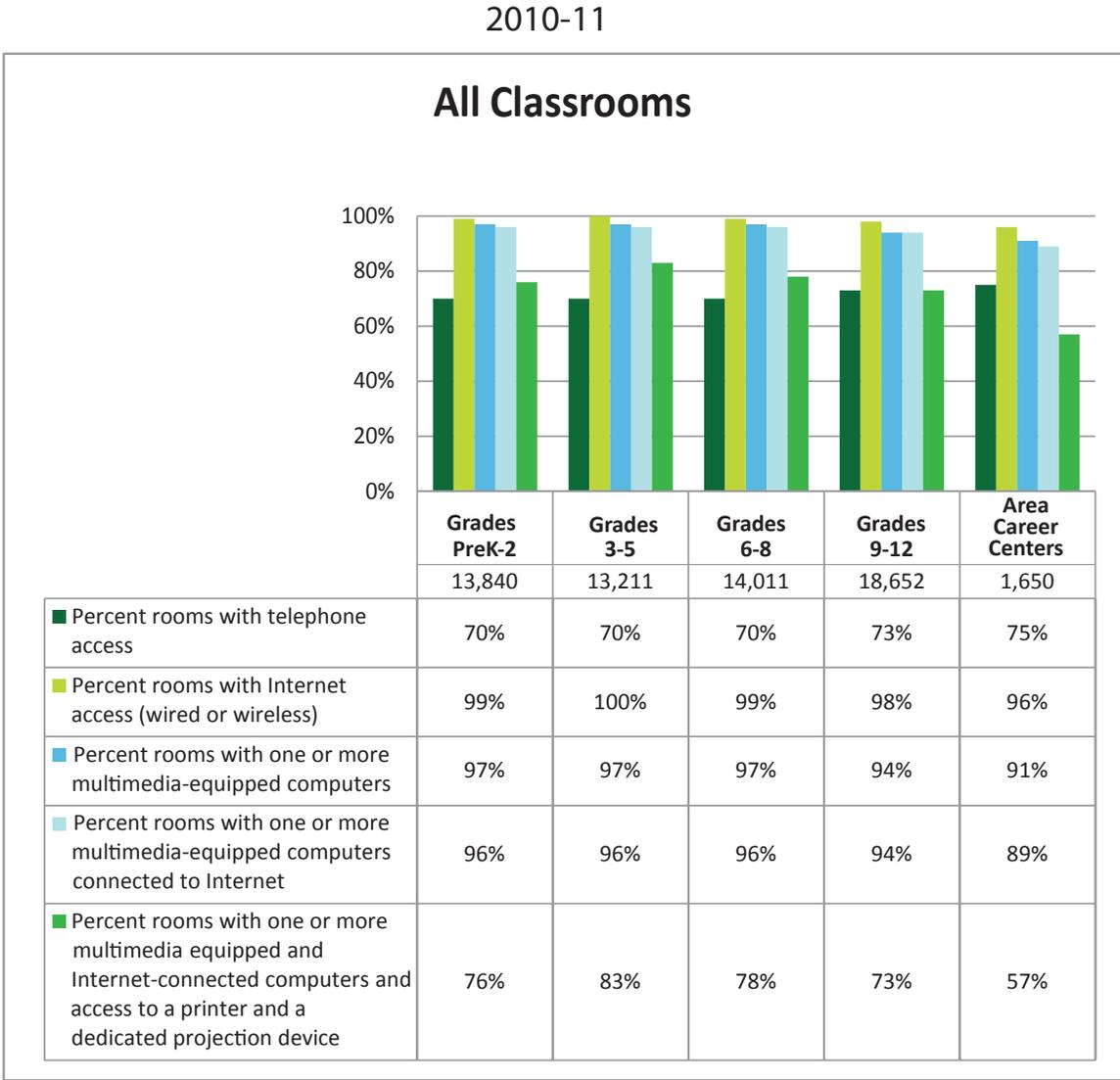


Figure 2 graphically represents how Missouri classrooms are outfitted with technology.

**Figure 2**

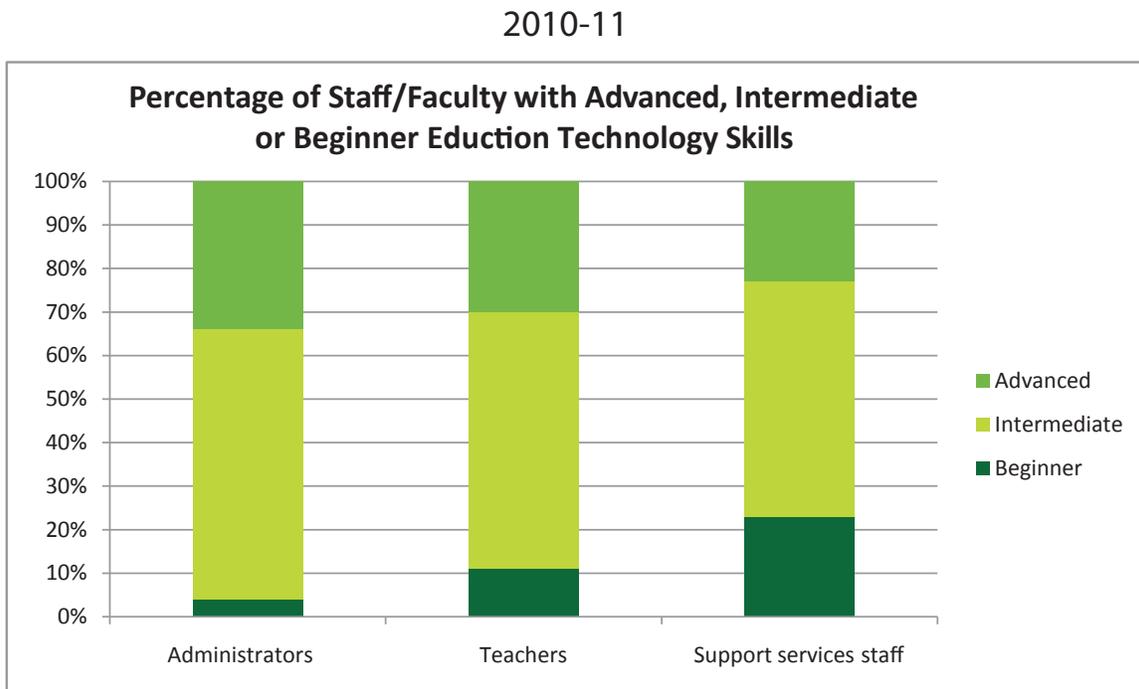


In Missouri, 57 percent of buildings reported that library media center provided off-site/remote access to electronic resources for students/staff. New technologies and increased bandwidth have made distance learning and collaboration available from virtually every desktop.

# Technology skills and usage

Figure 4 shows the percentage of staff and faculty with advanced, intermediate or beginner technology skill levels in 2010-11.

**Figure 4**

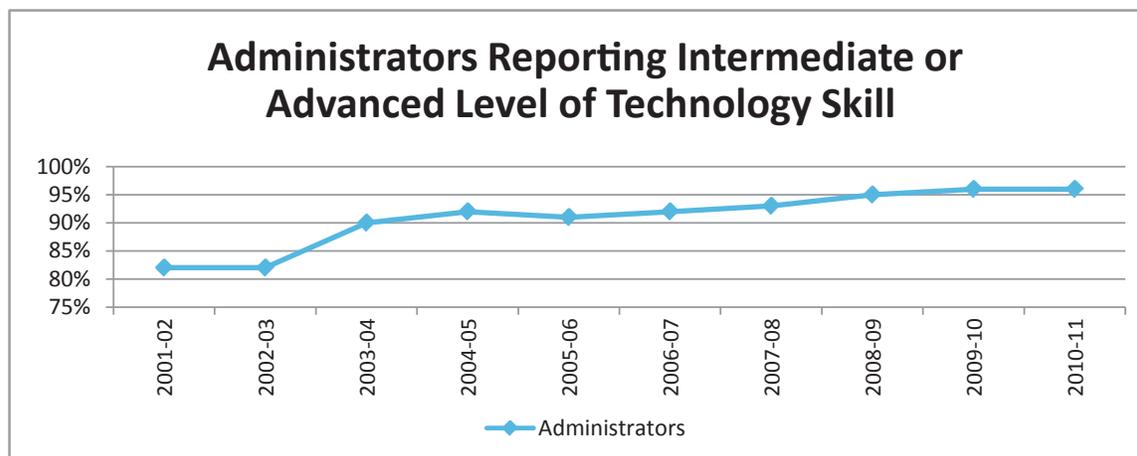


## Administrator technology skills

Approximately 96 percent of principals/building administrators reported having intermediate and/or advanced technology skills in 2010-11, compared to 96 percent in 2009; 95 percent in 2008; 93 percent in 2007; 92 percent in 2006; 91 percent in 2005; 92 percent in 2004; 90 percent in 2003; and 82 percent in both 2002 and 2001.

Ninety-seven percent of administrators reported using computers to communicate with peers, experts and others, while 91 percent also used computers to communicate with parents and students in 2010-11.

Figure 3



Eighty-nine percent of principals routinely conducted online research in 2010-11, compared to 85 percent in 2009; 84 percent in 2008; 82 percent in 2007; 81 percent in 2006; 79 percent in 2005; 80 percent in 2004; 79 percent in 2003; 69 percent in 2002; and 58 percent in 2001.

### Teacher technology skills

About 95 percent of teachers reported routinely using student-record software to manage student records and track student performance; 91 percent used computers to assess student performance; and 86 percent routinely used computers to deliver and prepare instruction in 2010-11.

Eighty-eight percent of teachers routinely used technology for lesson plan preparation in 2010-11, compared to 81 percent in 2009; 77 percent in 2008; 71 percent in 2007; 68 percent in 2006; 66 percent in 2005 and 2004; 64 percent in 2003; 59 percent in 2002; and 45 percent in 2001.

Eighty-nine percent of teachers reported having intermediate and/or advanced technology skills in 2010-11, compared to 88 percent in 2009; 86 percent in 2008; 84 percent in 2007; 82 percent in 2006; 81 percent in 2005 and 2004; 79 percent in 2003; 76 percent in 2002; and 72 percent in 2001.

### Staff technology skills

Seventy-six percent of school services staff reported having intermediate or advanced technology skills, compared to 82 percent reported in 2006.

## Technology usage

All districts report that technology is integrated into at least one core curriculum:

- 97 percent – communications arts
- 95 percent – science
- 94 percent – mathematics
- 93 percent – social studies

Administrators, teachers and students routinely use technology to produce print and multimedia products and conduct research. Administrators, faculty and students utilize technology during their school day for a variety of activities, as outlined in Table 3.

**Table 3**

2010-11

Function	Administrators	Teachers	Students
Produce media, web, or multimedia products to demonstrate learning, make presentations	87%	77%	
Produce written or print products to demonstrate learning, make presentations	94%	90%	72%
Communicate with peers, experts, others	99%	97%	59%
Communicate with parents and students	96%	91%	58%
Conduct online research	95%	89%	73%
Participate in online courses (this year)	63%	30%	27%
Manage student records (spreadsheet/database)	97%	95%	
Track student performance	96%	95%	
Assess student performance	95%	91%	
Deliver and present instruction	85%	86%	
Prepare lesson plan(s)		88%	

In the typical building, 75 percent of teachers reported fully integrating technology into the curriculum in 2011, compared to 50 percent in 2006.

# Technology planning

All districts have the necessary technology plans in place to qualify for E-rate and other funding opportunities. Plans are developed to help the district meet or exceed state and federal guidelines, and districts utilize resources from three broad categories to help them devise a plan that guides their instructional technology implementation. Those categories are:

- National instructional technology organizations:
  - National Educational Technology Standards (ISTE)
  - Standards for Technological Literacy: Content for the Study of Technology (ITEA)
- Groups and/or information that influence education technology policy and practice for districts, such as:
  - Children’s Internet Protection Act (CIPA)
  - Ten Sigma
  - NetSmartz
  - Community leaders
  - School board policy
- State guidelines, such as:
  - Missouri School Improvement Program (MSIP)
  - Comprehensive School Improvement Plan (CSIP)
  - Information, Communications Technology, and Media Literacy (ICTM) Grade-level Expectations (GLE) and Course-level (CLE) Expectations
  - Show-Me Standards
  - Missouri State Education Technology Plan (M0STEP)

Districts also set technology standards for students, faculty and staff, as shown in Tables 4 and 5.

- 94 percent have standards for middle school/junior high students (grades 6-8)
- 92 percent have standards for students in grades 3-5
- 89 percent have standards for PreK-2 elementary students
- 79 percent have standards for high school students (grades 9-12)
- 90 percent have standards for teachers
- 87 percent have standards for school administrators
- 81 percent have standards for support services staff

**Table 4**

2010-11

Student Populations with Technology Standards (Includes ALL that apply)	
STUDENTS:	PERCENT
PreK-2	89%
3-5	92%
6-8	94%
9-12	79%
Area Career Center (ACC) (56 ACCS)	100%
None	3%

**Table 5**

2010-11

Staff Populations with Technology Standards (Includes ALL that apply)	
STAFF	PERCENT
Administrators	87%
Teachers	90%
Support services staff	81%
None	8%

# Technology funding

Collectively, school districts reported the amount budgeted for technology for the 2010-11 was \$148,026,845. The average budget was \$267,196, with the median budget being \$50,000.

Although the median budget for technology has remained relatively stable for the past four years, districts report that equipment is aging and upgrades and replacements will be necessary. Additionally, items included in technology budgets differ from district to district, and some include personnel and contracted services.

**Table 6**

	<b>Reported Budget</b>	<b>Median Budget</b>	<b>Average Budget</b>
2008	\$162,600,000	\$55,000	\$295,093
2009	\$150,543,272	\$50,000	\$273,218
2010	\$160,346,301	\$55,000	\$288,912
2011	\$148,026,845	\$50,000	\$267,196



# Appendix

## Missouri Census of Technology 2011

### District-level items (Core Data Screen 30) N = 554

1). Board-approved education technology standards and population(s) that must meet the standards.

<b>STANDARDS (Check ALL that apply)</b>	<b>DISTRICTS/ LEAS</b>	<b>PERCENT LEAS</b>
Locally-developed	459	83%
Adopted National Educational Technology Standards (ISTE)	230	42%
Adopted Standards for Technological Literacy: Content for the Study of Technology (ITEA)	48	9%
Other (specify) National instructional technology organizations <ul style="list-style-type: none"> <li>• National Educational Technology Standards (ISTE)</li> <li>• Standards for Technological Literacy: Content for the Study of Technology (ITEA)</li> </ul> Organizations and groups that influence education technology policy and practice for districts such as: <ul style="list-style-type: none"> <li>• Children’s Internet Protection Act (CIPA)</li> <li>• Ten Sigma</li> <li>• NetSmartz</li> <li>• Community Leaders</li> <li>• Missouri School Board Association Policy</li> </ul> State guidelines such as: <ul style="list-style-type: none"> <li>• Missouri School Improvement Program (MSIP)</li> <li>• Comprehensive School Improvement Plan (CSIP)</li> <li>• Information, Communications Technology, and Media Literacy (ICTM) Grade-level (GLE) and Course-level (CLE) Expectations</li> <li>• Show-Me Standards</li> <li>• MO State Education Technology Plan (MOSTEP)</li> </ul>	26	5%
None	18	

<b>POPULATIONS (Check ALL that apply)</b>					
<b>STUDENTS:</b>	<b>LEAS</b>	<b>PERCENT</b>	<b>STAFF</b>	<b>LEAS</b>	<b>PERCENT</b>
PreK-2	492	89%	Administrators	484	87%
3-5	507	92%	Teachers	496	90%
6-8	520	94%	Support services staff	449	81%
9-12	439	79%	None	47	8%
Area Career Center (ACC) 56 ACCS	56	100%			
None	15	3%			

2). Core content area(s) in which technology is integrated. (Check ALL that apply.)

Core content area	LEAs	Percent
Communication Arts	538	97%
Mathematics	521	94%
Science	528	95%
Social Studies	517	93%

3). Amount budgeted for technology for current year.

Total	Average	Median
\$148,026,845	\$267,196	\$50,000

### Building-level Items (Core Data Screen 31) N = 2315

1). Estimated percentage of faculty/staff in the school building at each skill level of education technology use.

Faculty/Staff	Beginner	Intermediate	Advanced	Total
Administrator(s)	4%	62%	34%	100%
Teachers	11%	59%	30%	100%
Support services staff	24%	54%	24%	100%

2). Total number of Internet-connected computers by age and location. (Table revised to include Internet-connected computers)

Age of Computer	Instructional Rooms						Library/ Media Centers	Administrative Offices	Total
	Computer Labs	Classrooms				Area Career Centers			
		PreK-2	3-5	6-8	9-12				
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Under 1 Year – TOTAL	1,519	293	389	840	729	102	327	324	4,523
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PC # Internet- connected subtotal	102,169	32,645	46,663	42,161	64,555	8,498	25,559	21,910	344,160
HANDHELDS									
Subtotal	1,069	1,035	2,352	1,568	1,482	337	696	1,029	9,568
# Internet-connected	732	327	677	571	1,062	74	259	758	4,460
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# Internet-connected	114,749	37,481	52,675	49,717	72,422	9,186	29,880	24,092	390,202

3). Technology by type and location within school building.

Number of rooms	Computer Labs	Instructional Rooms					Area Career Centers	Library/ Media Centers	Admin Offices	Total
		PreK-2	3-5	6-8	9-12					
TOTAL NUMBER ROOMS	4,180	13,840	13,211	14,011	18,652	1,650	2,305	14,148	81,997	
with telephone access	3,070	9,664	9,291	9,866	13,705	1,238	2,098	13,837	62,769	
Percent rooms	73%	70%	70%	70%	73%	75%	91%	98%	77%	
with Internet access (wired or wireless)	4,180	13,762	13,188	13,865	18,315	1,582	2,286	13,952	81,318	
Percent rooms	100%	99%	100%	99%	98%	96%	99%	99%	99%	
with one or more multimedia-equipped computers	4,062	13,356	12,790	13,548	17,616	1,501	2,173	12,922	77,968	
Percent rooms	97%	97%	97%	97%	94%	91%	94%	91%	95%	
with one or more multimedia-equipped computers connected to Internet	4,080	13,258	12,630	13,494	17,538	1,462	2,159	12,568	77,189	
Percent rooms	98%	96%	96%	96%	94%	89%	94%	89%	94%	
with one or more multimedia-equipped and Internet-connected computers and access to a printer and a dedicated projection device	3,372	10,572	11,008	10,904	13,615	941	1,691	2,908	55,011	
Percent rooms	81%	76%	83%	78%	73%	57%	73%	21%	67%	

4). School building Internet connection by bandwidth and delivery mode.

BANDWIDTH	PERCENT	DELIVERY MODE	PERCENT
56kb – 384 kb	>1%	Copper line	16%
385kb – 1.4mb	2%	Fiber	72%
1.5mb (T1) – 9.9mb	39%	DSL	6%
10mb – 45mb	28%	Satellite	1%
45mb – 100mb	16%	Other (see below)	4%
>100mb	17%		
None			

5). Does the library media center provide off-site/remote access to electronic resources for students/staff?

Yes: 1,321

No: 946

- 6). Estimated percentage of administrators, teachers and students routinely using computers for following functions.

Function	Administrators	Teachers	Students
Produce media, web, or multimedia products to demonstrate learning, make presentations	87%	77%	
Produce written or print products to demonstrate learning, make presentations	94%	90%	72%
Communicate with peers, experts, others	99%	97%	59%
Communicate with parents and students	96%	91%	58%
Conduct online research	95%	89%	73%
Participate in online courses (this year)	63%	30%	27%
Manage student records (spreadsheet/database)	97%	95%	
Track student performance	96%	95%	
Assess student performance	95%	91%	
Deliver and present instruction	85%	86%	
Prepare lesson plan(s)	81%	88%	

- 7). Estimated percentage of teaching staff fully integrating technology into curriculum and instruction:

Median: 75 percent