Deepening Connections

Teachers Increasingly Rely on Media and Technology

PBS

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The eighth annual PBS teacher survey on media and technology use reflects a deepening commitment to media and digital technology that connect teachers and their students to educational resources. With each passing year, teachers' reliance on media and technology for classroom instruction and student engagement is increasing. Teachers value digital media as instructional resources that help them engage student interest, promote creativity and differentiate instruction. Increasingly, teachers are turning to the Internet to access content that traditionally has been distributed via television broadcasts.

> "TEACHERS VALUE DIGITAL MEDIA AS INSTRUCTIONAL RESOURCES THAT EMPOWER THEM TO ENGAGE STUDENT INTEREST, PROMOTE CREATIVITY AND DIFFERENTIATE INSTRUCTION."

Educators are not limiting their searches to classroom content. They also are seeking ways to improve and grow professionally. Teachers increasingly are using the Internet to access instructional strategies and opportunities for professional development, collaboration and inspiration.

The 2010 survey, conducted by Grunwald Associates LLC, revealed these key insights:

- The Internet is quickly becoming the source for media-based instruction, with streaming and downloading of content surging.

- Teachers believe that a variety of technology devices and Web-based systems help them do their jobs better and help them to engage students in learning.

- Teachers see great educational potential in smart, portable devices, including laptops, tablets, e-readers and handhelds.

- Teachers are joining online professional communities to connect, collaborate and share resources with other teachers.

Even more encouraging, the survey provides evidence that teachers are increasingly skilled at integrating digital media and technology into instructional practice and professional development.

Pre-K teachers, surveyed for the first time in 2009, trail K–12 teachers in their use of digital media and technology, but many see the benefits of age-appropriate digital content and technology.

This year's survey offers another insight into teachers' commitment and challenges. With school budgets under pressure, teachers are opening their own wallets as well as turning to free educational resources. That's a trend that we'll be watching in future surveys.

Robert M. Lippincott
Senior Vice President, Education
PBS

KEY FINDINGS

The Internet is fast becoming the source for media-based instruction, with streaming and downloading of content surging.

The vast majority of K–12 teachers (97 percent) use digital media for classroom instruction. Increasingly, the Internet is the platform for searching for, finding, retrieving, using and managing digital media—including interactive games, activities, lesson plans and simulations.
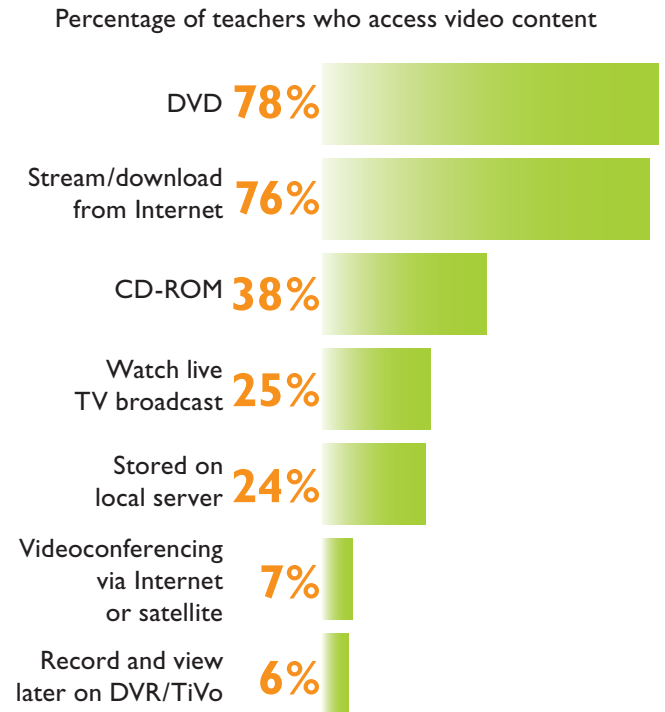
K–12 teachers continue to see the benefits of digital media, with frequent users (those who use these resources two times a week or more) increasing significantly since 2009. More than six in 10 K–12 teachers (62 percent) report that they use digital media frequently for classroom instruction. Almost one in four teachers (24 percent) report that they use digital media *every day.*

The increased use of digital media in the classroom could be attributed to its greater availability and easier access on the Web. Internet search engines could be making it easier for K–12 teachers to make good use of valuable digital content for their lessons.

The Internet is giving new life to video content for classroom instruction. Teachers' streaming and downloading of video content traditionally distributed via television broadcast or DVDs increased significantly for yet another year in a row, now just narrowly behind DVD use, as shown in **Figure 1**. All of the momentum is on the side of the Internet. Seventy-eight percent of K–12 teachers report that they access video content on DVDs—a figure that hasn't budged over the past several years. In contrast, the percentage of teachers reporting that they stream or download video content increased from 55 percent in 2007 to 76 percent in 2010.

Another finding indicates that teachers are accessing video content in completely new ways. Almost one in four K–12 teachers (24 percent) report that they access video content stored on a local server, up from 11 percent in 2007, a significant increase. And seven percent report that they access this content by videoconferencing via the Internet or satellite.

Figure 1.
Streaming and Downloading of Video Content From the Internet Now Rivals DVD Use

Percentage of teachers who access video content

DVD **78%**

Stream/download from Internet **76%**

CD-ROM **38%**

Watch live TV broadcast **25%**

Stored on local server **24%**

Videoconferencing via Internet or satellite **7%**

Record and view later on DVR/TiVo **6%**

Source: PBS and Grunwald Associates LLC, 2010

Streamed and downloaded content could be easier to integrate and customize for instruction. In fact, teachers' use of short video segments (from three minutes to less than five minutes in length) increased this year, with 29 percent of teachers reporting this is the average length of video segments they use, up from 22 percent in 2009. Use of longer segments of 10 minutes or more was down significantly this year. Teachers seem to be using video more strategically to introduce, supplement and reinforce content and to engage students in learning.

There is a downside to the popularity of streaming video content over the Internet. Problems with streaming video include skipping, pausing or constant buffering, indicating that computing devices or technology infrastructure, or both, do not yet have the capacity to handle teachers' increasingly Internet-dependent instructional activity. Most teachers (78 percent) encounter difficulties at least some of the time, with a quarter experiencing problems often or always, as shown in **Figure 2.**

Figure 2.
Most Teachers Encounter Difficulties When Streaming Video

Percentage of teachers who experience problems when streaming video
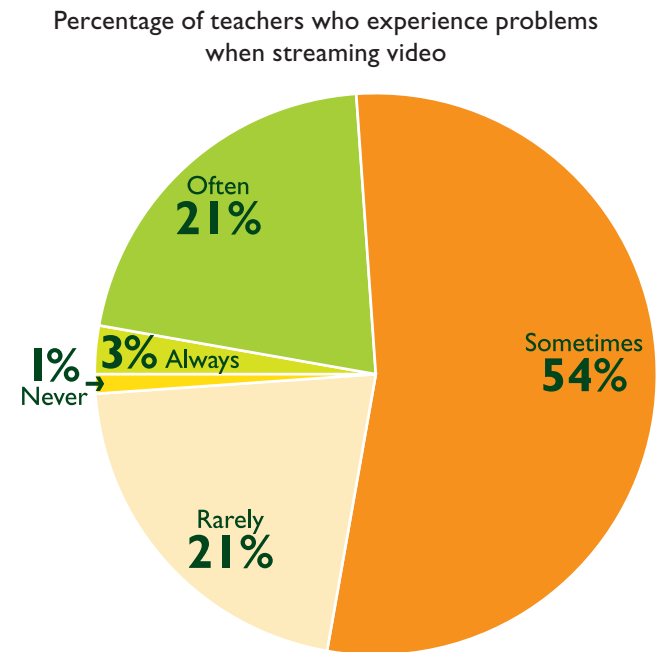
Source: PBS and Grunwald Associates LLC, 2010

Teachers' increased use of video content is matched by increases in their perceptions of its benefits. The majority of K–12 teachers (82 percent) continue to believe that video content is more effective when it is integrated with other instructional resources or content. All other perceived benefits of video use in the classroom increased significantly this year. A majority of teachers believe that video content stimulates discussions (68 percent), increases student motivation (66 percent), helps teachers be more effective (62 percent), is preferred by students (61 percent) and helps teachers be more creative (55 percent), as shown in **Figure 3.**

Many teachers also believe that video content stimulates student creativity (47 percent), directly increases student achievement (42 percent) and is more effective than other types of instructional resources or content (31 percent).
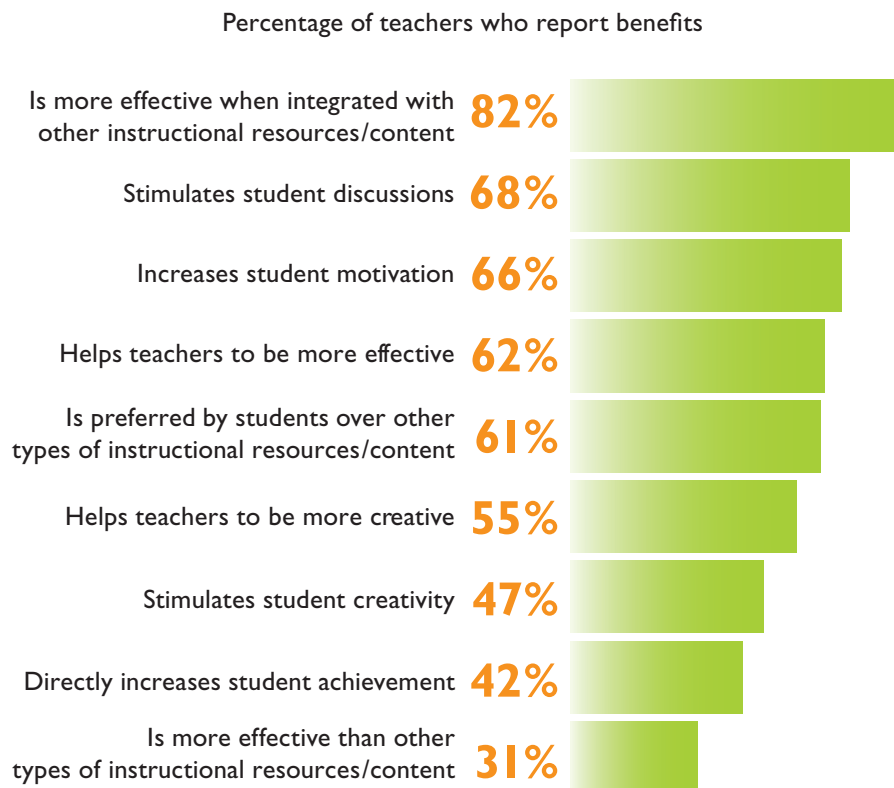
Meanwhile, similar percentages of K–12 teachers feel strongly that classroom resources in digital format, such as Web sites, interactive online games, podcasts and lesson plans, are valuable for many of the same reasons. Notably, 67 percent of teachers believe that digital resources help them to differentiate learning for individual students.

Teachers find value in many different types of digital resources, as shown in **Figure 4.** Topping the list is research information for student use, with professional development resources and image collections next in line. In 2010, student-created content (including student-created and student-submission Web sites) showed significant gains in perceived educational value over the past few years:
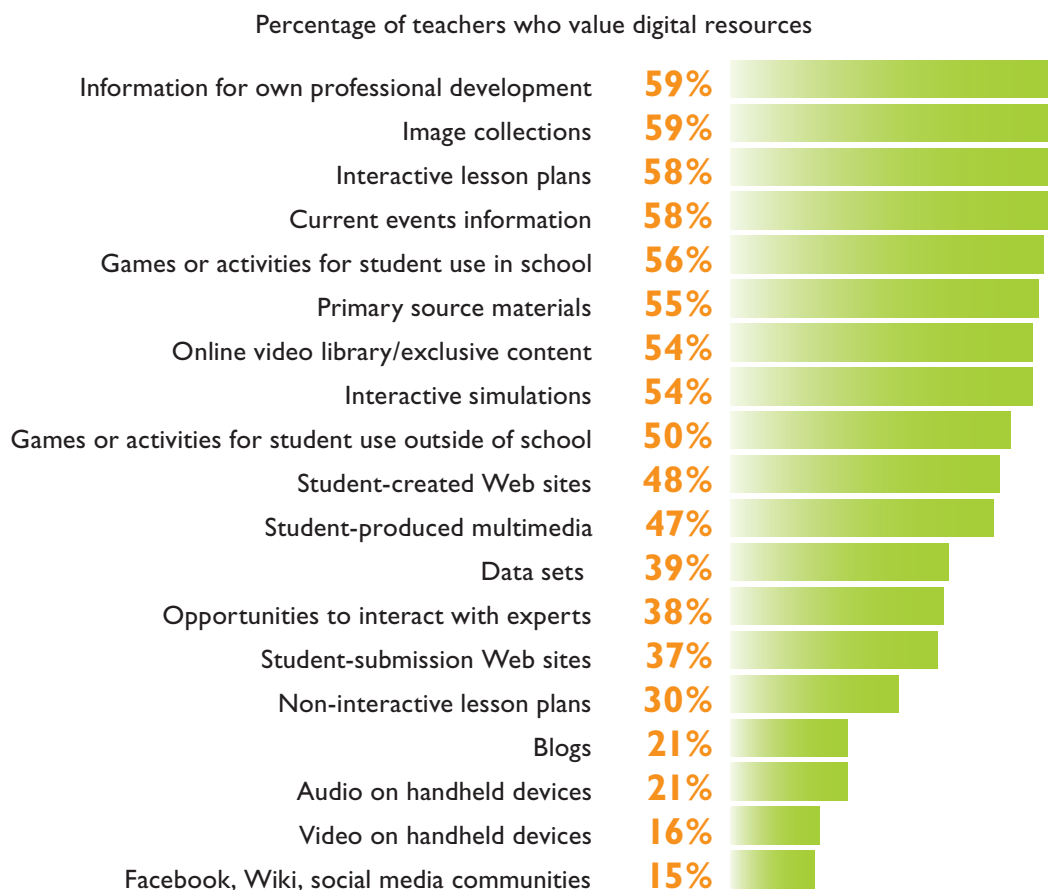
● **48 percent** of teachers find value in student-created Web sites in 2010, compared to **37 percent** in 2009, **33 percent** in 2008 and **30 percent** in 2007.

● **37 percent** of teachers find value in student-submission Web sites in 2010, compared to **29 percent** in 2009, **25 percent** in 2008 and **20 percent** in 2007.

Figure 3.
Perceived Benefits of Using Video Content in the Classroom

Percentage of teachers who report benefits

Is more effective when integrated with other instructional resources/content	**82%**
Stimulates student discussions	**68%**
Increases student motivation	**66%**
Helps teachers to be more effective	**62%**
Is preferred by students over other types of instructional resources/content	**61%**
Helps teachers to be more creative	**55%**
Stimulates student creativity	**47%**
Directly increases student achievement	**42%**
Is more effective than other types of instructional resources/content	**31%**

Source: PBS and Grunwald Associates LLC, 2010

Figure 4.
Teachers Value Many Types of Digital Resources

Percentage of teachers who value digital resources

Resource	%
Information for own professional development	**59%**
Image collections	**59%**
Interactive lesson plans	**58%**
Current events information	**58%**
Games or activities for student use in school	**56%**
Primary source materials	**55%**
Online video library/exclusive content	**54%**
Interactive simulations	**54%**
Games or activities for student use outside of school	**50%**
Student-created Web sites	**48%**
Student-produced multimedia	**47%**
Data sets	**39%**
Opportunities to interact with experts	**38%**
Student-submission Web sites	**37%**
Non-interactive lesson plans	**30%**
Blogs	**21%**
Audio on handheld devices	**21%**
Video on handheld devices	**16%**
Facebook, Wiki, social media communities	**15%**

Source: PBS and Grunwald Associates LLC, 2010

The perceived value of blogs, audio and video on handheld devices has increased steadily as well:

- **21 percent** of teachers find value in blogs in 2010, compared to **15 percent** in 2009, **11 percent** in 2008 and **8 percent** in 2007.

- For audio on handhelds, **21 percent** of teachers say they are valuable in 2010, compared to **16 percent** in 2009, **13 percent** in 2008 and **11 percent** in 2007.

- For video on handhelds, **16 percent** of teachers find them valuable in 2010, compared to **12 percent** in 2009, **9 percent** in 2008 and **6 percent** in 2007.

In another sign that instructional activity is migrating to the Web, about 40 percent of K–12 teachers report that they use Web-based content management systems. More than twice as many teachers (84 percent) report that their school or district has some sort of data management system to store and track student assessment data electronically. Most teachers who have data management systems available (83 percent) make at least some instructional decisions based on this data. Teachers report using data management systems to track assessment scores (76 percent), refine the curriculum (71 percent), develop individual education plans (62 percent), or get professional development or feedback (54 percent).

School budgets are under pressure—and many teachers are opening their own wallets as well as turning to free resources.

Declining school budgets are having an impact on teachers' ability to use media and technology resources. More than half of K–12 teachers (54 percent) report that their school media budgets have decreased over the past year—a similar proportion as in 2009. There are other signs that tight school media budgets could be squeezing teachers' valued use of media and technology for instruction:

- The cost of video was more likely to be a barrier to usage this year, sharing the number one spot with planning time constraints as a key barrier, with 35 percent of teachers citing these two barriers to increased use. The use of other instructional resources and a lack of instructional time both saw significant decreases as barriers from 2009.

- The percentage of teachers whose schools subscribe to fee-based multimedia continues to decrease, with only 54 percent indicating their schools subscribe to some type of service (versus 65 percent in 2008 and 60 percent in 2009).

- Cost continues to grow as the main barrier to using fee-based digital resources more often, with 46 percent of teachers citing this barrier. Time constraints are also significant barriers, with not enough planning time (33 percent) or instructional time (31 percent) being the main issues, teachers report. Elementary school teachers are more likely to name time constraints and a lack of age-appropriate content as being key barriers.

But teachers appear to have such a deep commitment to having adequate instructional resources that they are supplementing school resources to provide them. Strikingly, teachers spend 60 percent of their time using educational resources that were either free or that they paid for themselves. On average, teachers report that they spend 40 percent of their time using products and resources purchased by their school or district, 35 percent of their time using free resources they found themselves and 25 percent of their time using resources purchased with their own money, as shown in **Figure 5.**

Figure 5.
Teachers Opening Their Own Wallets — and Finding Free Resources As Well
Average percent of time teachers spent using products and resources

- 25% Purchased with my own money
- 35% Free resources
- 40% Purchased by school or district
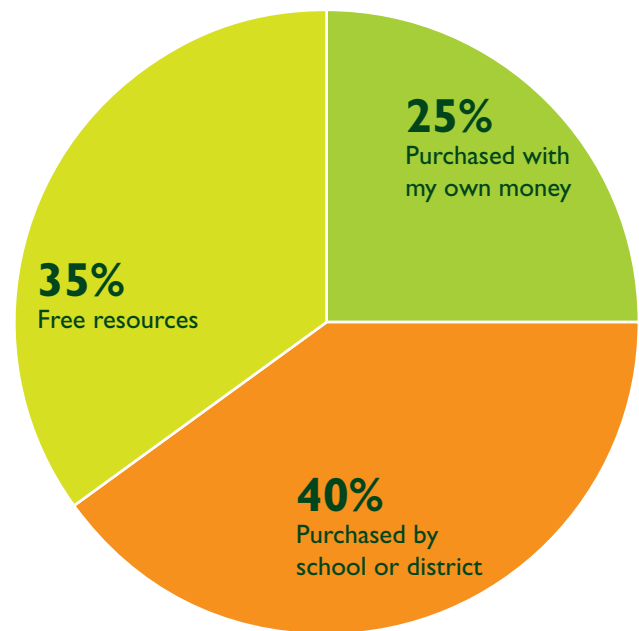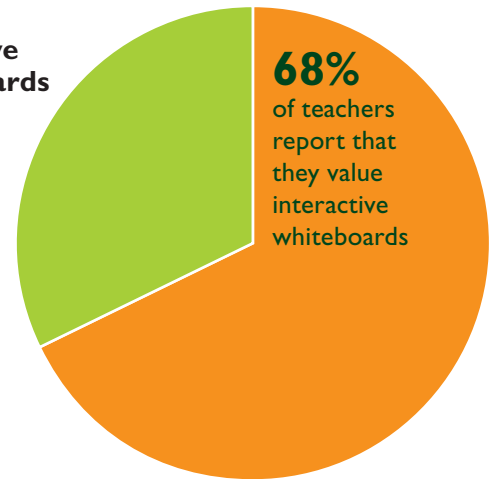
Source: PBS and Grunwald Associates LLC, 2010

Teachers believe that a variety of technology devices and Web-based systems help them do their jobs better and help them to engage students in learning.

Interactive whiteboards are considered the most valuable digital resource, especially among elementary school teachers, as shown in **Figure 6:**

- **68 percent** of K–12 teachers report that they value interactive whiteboards. Other digital resources that the majority of teachers value are online images (67 percent), online video content (63 percent), Web-based interactive games or activities (62 percent), articles related to instruction (58 percent), online lesson plans (58 percent), interactive simulations (53 percent) and online professional development, such as courses, classes or seminars (51 percent).

- Not surprisingly, use of interactive whiteboards seems to be tied to classroom availability. **40 percent** of K–12 teachers report that they use interactive whiteboards to supplement or support teaching, with 59 percent of teachers saying that this technology is available in their school and 36 percent saying it is available in their classroom. Teachers also report using Web-based interactive games (54 percent), online lesson plans (52 percent), online video content (46 percent), and digital cameras (40 percent). Interactive whiteboards, games and digital cameras are more commonly used in the elementary grades.

- Interactive whiteboards top teachers' wish lists for technology that they believe they need, but that is not currently available to them. **17 percent** of all teachers report that interactive whiteboards are a resource they don't have, but want. Computers, including laptops, are the next most sought-after technologies, with 9 percent of teachers saying they need more or better computers and 6 percent saying they need more or better laptops.

Figure 6.
More Than Any Other Technology, Teachers Value, Use and Want Interactive Whiteboards
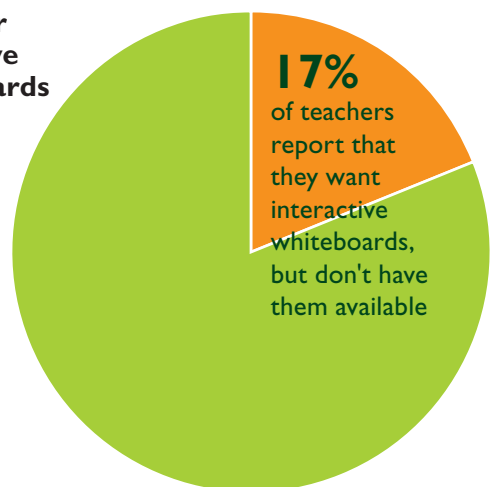
Value of Interactive Whiteboards

68% of teachers report that they value interactive whiteboards

Use of Interactive Whiteboards

40% of teachers report that they use interactive whiteboards

'Need' for Interactive Whiteboards

17% of teachers report that they want interactive whiteboards, but don't have them available
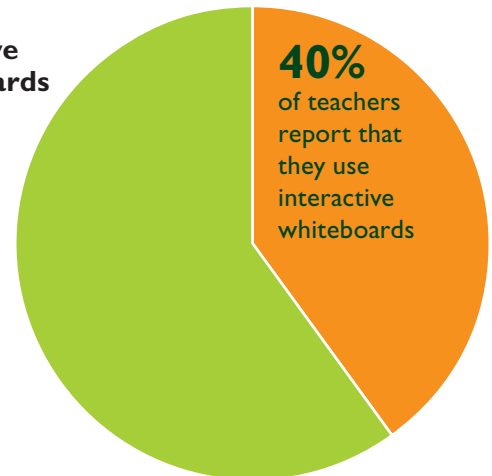
Source: PBS and Grunwald Associates LLC, 2010

Teachers cite many reasons for their strong affinity for interactive whiteboards: 93 percent of teachers who use this technology say it helps them to be more effective, 91 percent say it helps them to be more creative, 83 percent say it increases student motivation, 78 percent say it stimulates student discussions, 75 percent say it stimulates student creativity and 70 percent say it is directly related to student achievement. Teachers also deem interactive whiteboards more effective when they are integrated with other instructional resources or content.
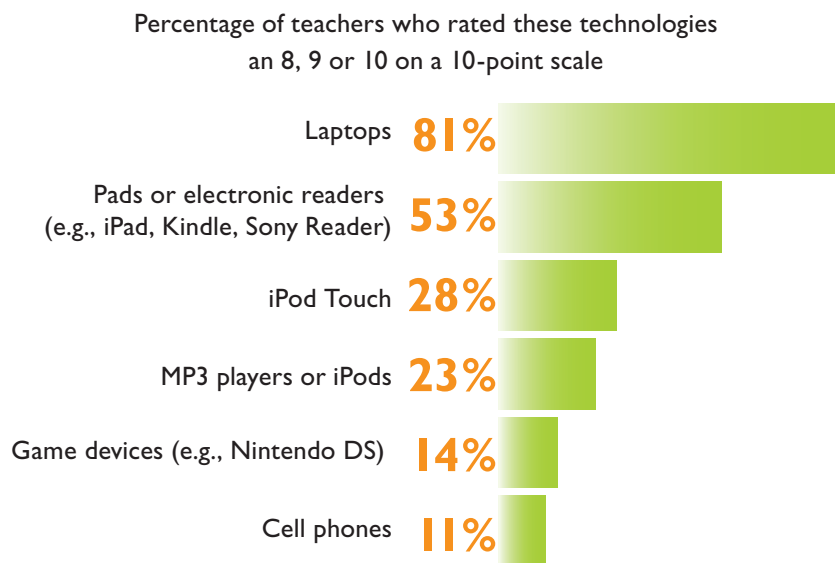
The popularity of interactive whiteboards could be another indication of the Internet's importance as a platform for technology-based instruction, since whiteboards can be a vehicle to access online instructional and professional development resources. At the same time, interactive whiteboards could be a bridge from traditional pedagogy—the teacher in the front of the class delivering information—to a more collaborative culture of learning supported by technology.

Teachers see great educational potential in smart, portable devices, including laptops, tablets, e-readers, and handhelds.

K–12 teachers believe that laptops hold the greatest education potential among popular portable technologies, with 81 percent of teachers saying laptops would enhance education, as shown in **Figure 7.** But a majority of teachers (53 percent) believe that more recent entries into the consumer market, such as iPads, Kindles, Sony Readers, and other pad-like devices and e-readers could be valuable in education as well. iPod Touches and MP3 players and iPods garnered support from teachers as well.

As much as teachers perceive the educational value of digital resources and recognize some potential in smart, mobile devices, students' ability to use these devices at school is severely limited. Most personal student devices are off limits during school, with teachers reporting that cell phones, game devices, and MP3 players and iPods are largely banned.

Figure 7.
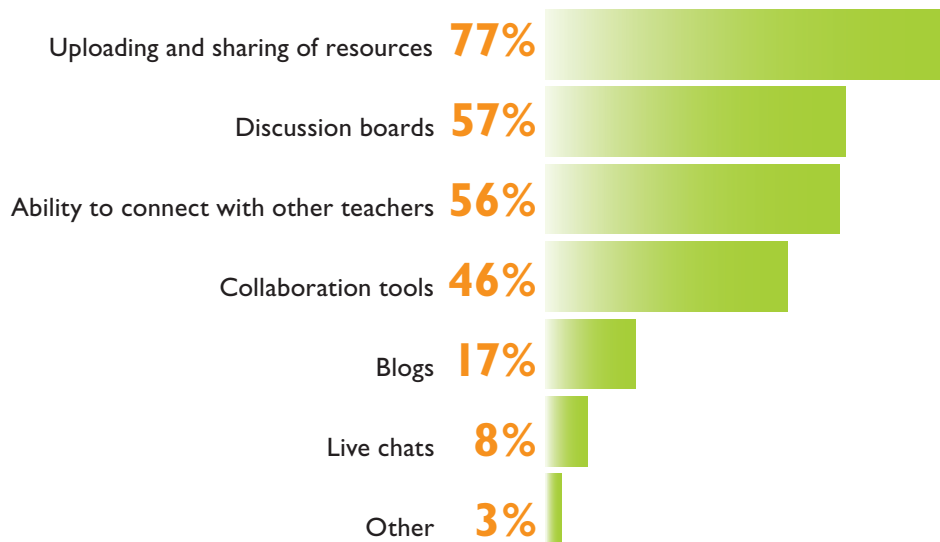**Portable Technologies with the Greatest Educational Potential**

Percentage of teachers who rated these technologies
an 8, 9 or 10 on a 10-point scale

Technology	Percentage
Laptops	81%
Pads or electronic readers (e.g., iPad, Kindle, Sony Reader)	53%
iPod Touch	28%
MP3 players or iPods	23%
Game devices (e.g., Nintendo DS)	14%
Cell phones	11%

Source: PBS and Grunwald Associates LLC, 2010

Figure 8.
Useful Features of Online Communities
Percentage of teachers who belong to online teacher communities who say these features are useful

Feature	Percentage
Uploading and sharing of resources	**77%**
Discussion boards	**57%**
Ability to connect with other teachers	**56%**
Collaboration tools	**46%**
Blogs	**17%**
Live chats	**8%**
Other	**3%**

Source: PBS and Grunwald Associates LLC, 2010

Teachers join online professional communities to connect, collaborate and share resources with other teachers.

Online community membership remained steady in 2010, with one in four K–12 teachers (26 percent) reporting membership in an online teacher community. Teachers who belong to online communities join because they want to exchange resources (77 percent), obtain information or advice (76 percent), and feel connected with fellow teachers (49 percent).

Teachers' perceptions of the usefulness of discussion boards and the ability to connect with other teachers increased significantly in 2010. Teachers who belong to online teacher communities continue to find the ability to upload and share resources to be their most useful feature. Teachers also consider discussion boards, the ability to connect with other teachers and collaboration tools to be useful, as shown in **Figure 8.**

"TEACHERS' PERCEPTIONS OF THE USEFULNESS OF DISCUSSION BOARDS AND THE ABILITY TO CONNECT WITH OTHER TEACHERS INCREASED SIGNIFICANTLY IN 2010."

Pre-K Teachers Use and Value Media and Technology—But to a Lesser Extent

Most pre-K teachers use digital, TV or video content in the classroom to at least some extent. However, they tend to be less frequent and less avid users than K–12 teachers. Eighty-two percent of pre–K teachers report that they use digital content, compared to 97 percent of K–12 teachers. Twenty-eight percent of pre–K teachers are frequent users of digital content, compared to 62 percent of K–12 teachers.
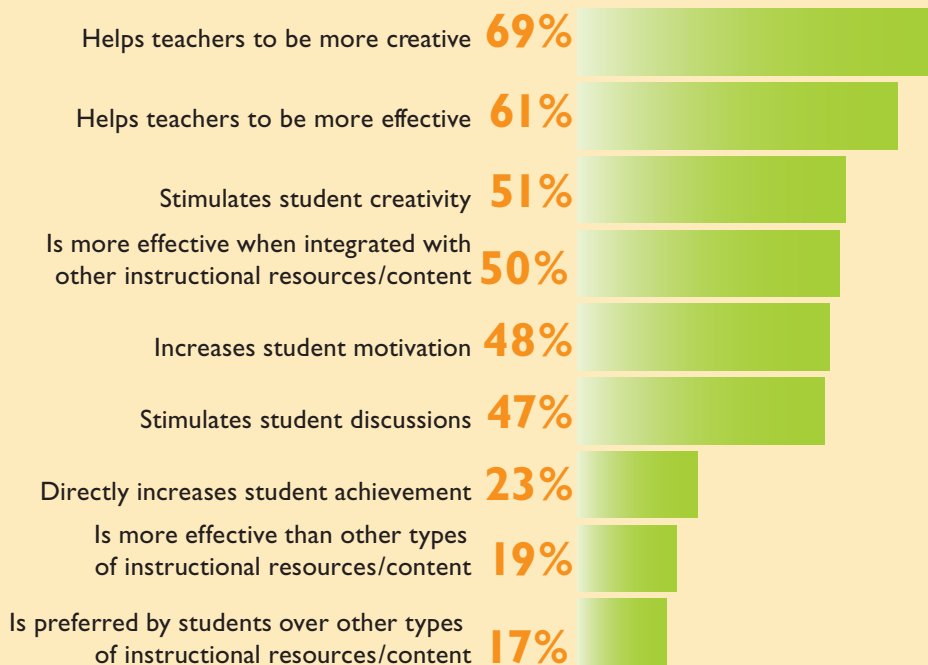
Pre–K teachers do find value in the digital resources they use, but they are generally less enthusiastic than K–12 teachers. The only digital resource that the majority of pre–K teachers (54 percent) rate as highly valuable is information for professional development. Half of pre–K teachers (50 percent) cite image collections as highly valuable. About four in 10 pre–K teachers value these other digital resources:

- Research information for student use (44 percent)
- Current events information (44 percent)
- Interactive lesson plans (43 percent)
- Online video library/exclusive content (41 percent)
- Primary source materials (41 percent)
- Games or activities for student use in school (41 percent)
- Games or activities for student use outside of school (39 percent)

In a similar finding, 65 percent of pre–K teachers say they use video content, compared to 95 percent of K–12 teachers. Just 22 percent of pre–K teachers frequently use video content; double the percentage of K–12 teachers (44 percent) are frequent users. Pre–K teachers' usage—and frequency of use—of video content declined since 2009.

Pre–K teachers are less likely than K–12 teachers to believe that TV and video have benefits for

Figure 9.
Pre-K Teachers See Value in Digital Cameras
Percentage of pre–K teachers who cite these reasons
for using digital cameras in the classroom

Reason	Percentage
Helps teachers to be more creative	69%
Helps teachers to be more effective	61%
Stimulates student creativity	51%
Is more effective when integrated with other instructional resources/content	50%
Increases student motivation	48%
Stimulates student discussions	47%
Directly increases student achievement	23%
Is more effective than other types of instructional resources/content	19%
Is preferred by students over other types of instructional resources/content	17%

Source: PBS and Grunwald Associates LLC, 2010

either students or teachers. Like K–12 teachers, most pre–K teachers (63 percent) believe video content is more effective when integrated with other instructional content. Notably, 41 percent of pre–K teachers report that video content stimulates student discussions—an activity that supports literacy development, an important goal of many pre–K programs. An extensive body of scholarly research shows that pre-K oral language development is a foundation for later success in reading and writing.

While cost and time constraints are the greatest barriers to TV and video use among K–12 teachers, pre–K teachers cite different barriers. Forty-nine percent of pre–K teachers say they use other instructional resources and content, while 42 percent said that TV and video programs are not appropriate for their students.

As for pre–K teachers' use and value of specific technologies, there is one standout: digital cameras. Most pre–K teachers (61 percent) use digital cameras to supplement or support their teaching, compared to 40 percent of K–12 teachers. Even more pre–K teachers (66 percent) consider digital cameras to be the most valuable instructional technology. Pre–K teachers say that digital cameras help them be more creative and effective and help them stimulate student creativity, as shown in **Figure 9.**

Other pre–K findings:

- As in K–12, pre-K teachers see laptops as holding the **greatest educational potential,** followed by iPads or e-readers. Other devices are seen as having more limited educational value for preschoolers.
- Fewer than half of pre-K teachers (45 percent) have some sort of **data management system** available to store and track student assessment data electronically.
- Membership in an online **teacher community** is not particularly common among pre–K teachers. Only 17 percent are members, which is significantly less than K–12 teachers, 26 percent of whom belong to an online community.
- Few pre–K teachers report that their schools subscribe to **fee-based digital services**—and these subscriptions have decreased in the past year, even though pre–K teachers report their

school's media budgets stayed the same in that time period. The decline in fee-based services is primarily in the areas of digital video services and comprehensive curriculum resources.

- Cost is a key reason pre-K teachers don't use fee-based digital resources, but so is **age-appropriate content**. Half of pre-K teachers (50 percent) believe that the content available in fee-based resources is not appropriate for their students' age or ability. And 35 percent of pre–K teachers say that the equipment needed to access digital resources is not readily accessible. In both cases, these barriers are bigger issues than they are for K–12 teachers.

Overall, these findings suggest that media and technology resources are making their way into pre–K classrooms, albeit in ways that suggest more tentative and, perhaps, skeptical integration by pre–K teachers. Given the focus on early childhood learning, which is a major thrust of federal education initiatives, the differences between K–12 and pre-K teachers' use, perceived value and attitudes toward media and technology may be worth exploring.

About the Survey

This survey series is conducted by Grunwald Associates LLC, an independent research and consulting firm that has conducted highly respected surveys on educator and family technology use since 1995.

The nationwide, online survey reflects the views of 1,401 full-time classroom teachers (1,204 K–12 public school teachers and 197 pre-K teachers in public and private schools). This sample was selected to represent teachers in urban, suburban and rural regions and in districts of all sizes. The sample population also was controlled to match the distribution of teachers surveyed by grades taught, years of teaching experience and gender to allow for comparisons to previous years' surveys. Hypothesis managed the research and provided valuable assistance in the creation of this public report.

About PBS

PBS, with its 356 member stations, offers all Americans—from every walk of life—the opportunity to explore new ideas and new worlds through television and online content. Each month, PBS reaches more than 115 million people on-air and online, inviting them to experience the worlds of science, history, nature and public affairs; hear diverse viewpoints; and take front-row seats to world-class drama and performances. PBS' broad array of programs has been consistently honored by the industry's most coveted award competitions. Teachers of children from pre-K through 12th grade turn to PBS for digital content and services that help bring classroom lessons to life. PBS' premier children's TV programming and Web site, *pbskids.org,* are parents' and teachers' most trusted partners in inspiring and nurturing curiosity and love of learning in children. More information about PBS is available at *www.pbs.org,* one of the leading dot-org Web sites on the Internet.

About PBS Education

PBS Education is building a collaborative network of 21st century educators and learners who turn to public media to transform teaching and learning. The PBS Teachers Web Site, *www.pbs.org/teachers*, offers a searchable library of over 9,000 free local and national standards-based teaching resources. It is also home to the leading online teacher professional development service, PBS TeacherLine. PBS Education is also developing the Digital Learning Library, a growing collection of purpose-built digital learning objects for pre-K–12 teachers and students that will be available through PBS member stations nationwide.

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