Comparative Analysis of National Teacher Surveys

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Introduction

It seems that every few months, we hear of yet another national survey of teachers and technology. While each may offer a unique perspective on what's going on in classrooms across the U.S.— from teachers' impressions about students' home media use to how they're learning to integrate technology into their instruction—there's quite a bit of overlap among these studies, too.

This QuickReport provides side-by-side comparisons of five high-profile surveys of teachers and technology, all released between February 2012 and February 2013. We conducted this analysis for our own purposes—to prepare for our second annual survey of teachers and digital games— but in doing so, we realized that others might also find it useful to see all five surveys in one place. By stitching together findings from across these complementary studies, we gain a more comprehensive view of how teacher practices and attitudes are evolving with respect to technology integration, and a firmer sense of what teachers nationwide need to provide instruction that is relevant, engaging, and effective for all students. These comparisons have also revealed gaps that future survey research should aim to fill.

For this analysis we only reviewed national[1] surveys that polled K-12 classroom teachers on their practices around and attitudes toward technology. We did not include surveys that only inventory classroom technologies and broadband access (such as those regularly conducted by the National Center for Educational Statistics), but did include surveys that inquired about technology practices and attitudes as well as classroom technology inventories. Based on these criteria, our report features:
  * The Gates Foundation's Technology and Effective Teaching in the U.S. (February 2012)
  * The Joan Ganz Cooney Center's National Survey of Teacher Attitudes & Beliefs on Digital Games & Learning (May 2012)
  * Common Sense Media's Children, Teens, and Entertainment Media (Fall 2012)
  * PBS LearningMedia's Teacher Technology Usage Survey (January 2013)
  * Pew Research Center's Internet & American Life Project Online Survey of Teachers (February 2013)

The methods of analysis were simple: From each published report we pulled the survey's (a) goals, (b) dates and respondent demographics, and (c) topline findings. We then looked across all surveys' toplines for common themes and sub-themes, and subsequently reorganized the findings according to these emergent categories. The Cross-Survey Synthesis—the only section of the report that offers the Cooney Center's original perspectives on this exercise—highlights areas of inquiry that we believe deserve deeper investigation.

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[1] We sought surveys that polled teachers from all 50 states, but did not require their samples to be nationally representative.

Survey Goals

Joan Ganz Cooney Center (2012)
The Joan Ganz Cooney Center survey investigates "what teachers think about game-based learning [and] how games impact students beyond academic achievement." (1: p. 2)[2]

Bill & Melinda Gates Foundation (2012)
"The primary goal of the research was to help us and our partners better understand:
- How teachers currently use technology inside and outside the classroom to advance their teaching; and,
- Existing barriers that prevent or deter teachers' use of technology in the classroom." (p. 2)

Common Sense Media (2012)
"This survey explores the question of how the TV shows, video games, texting, social networking, music, and other media that are so much a part of young people's lives affect the other big part of their lives—their academic and social development at school. We examine this issue through one important lens: the views and experiences of classroom teachers." (p. 5)

PBS LearningMedia (2013)
The PBS LearningMedia survey investigates:
- "The amount and type of technology platforms in America's classrooms, including identification of emerging trends, such as increased tablet usage;
- How frequently and for what purposes teachers are using this technology in their classrooms;
- Teachers' attitudes toward technology in their classrooms; and
- Training needs." (p. 1)

Pew Research Center (2013)
"This study is the Pew Research Center's Internet & American Life Project's first extensive examination of teachers' perceptions of the positive and negative impacts of a rapidly evolving technological environment on teachers' professional activities and how that new environment has impacted teachers' own tech use. This research was developed to explore not only teachers' assessments of students' research and writing habits, but also the broad impacts of digital technologies on their students, and the extent to which teachers incorporate digital technologies into classroom pedagogy." (p. 11)

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[2] In this analysis, we cite the page number from which we drew specific data or quotations. For all but the Cooney Center survey, these citations refer to a single report listed in the References section. For the Cooney Center survey, we drew from two separate presentation decks, one published (Millstone, 2012) and one unpublished (VeraQuest, 2012). Page numbers for Cooney Center data are preceded by a 1 for a Millstone reference and a 2 for a VeraQuest reference.

Survey Dates and Demographics

Joan Ganz Cooney Center
- Date of Survey: March 2012
- 505 teachers who use digital games in their teaching
- K-8 Classrooms (majority K-5)
- 20% Special Education teachers
- 86% teach in public schools, 60% of which are Title I schools
- 80% have been teaching 5+ years, 25% teaching between 5-9 years, 20% teaching 25+ years

Bill & Melinda Gates Foundation
- Date of Survey: October-November 2011
- 401 teachers, age range late 20s-early 50s
- Grades 6-12
- Varying amounts of teaching experience

Common Sense Media
- Date of Survey: May 2012
- 685 teachers
- 53% K-5, 33% 6-8, 33% 9-12
- 83% teach in public schools
- Varying amounts of teaching experience: 30% 3-9 years' experience, 20% 10-14 years, 20% 25 years or more

PBS LearningMedia
- Date of Survey: January 2013
- 503 teachers
- Pre-K-12
- 53% teach in middle income schools, 39% in low income, 8% in affluent
- 53% teach in suburban schools, 25% in urban, 24% in rural

Pew Research Center
- Date of Survey: March-April 2012
- 2,462 AP and National Writing Project (NWP) teachers
- Middle school and high school teachers
- 95% teach in public schools
- One-third of the sample (NWP Summer Institute Teachers) received training on how to effectively teach writing in a digital environment
- 56% of participating teachers teach accelerated courses, skewing the population toward high achieving students

Cross-Survey Themes

Data points cited in this section were gathered from survey reports, instruments, and presentations.

Technology Use in the Classroom

CONTENT AND ACTIVITIES

A. Joan Ganz Cooney Center
- "What genre of digital games do your students play during class time? Select all that apply." (2: p. 14)
  - o "95% of teachers use digital games that were created specifically for educational use." (1: p. 7)
  - o "These games are used most often in connection with literacy/reading (50%) and math (35%) content." (1: p. 7)

B. PBS LearningMedia
- 45% report using interactive games or activities. (p. 11)
- 43% report using online video content. (p. 11)
- 43% report using online images (p. 11)
- "Among teachers who use tablets, 71% cite the use of educational applications as the most beneficial for teaching, followed by educational websites (64%) and educational e-books/textbooks (60%)." (p. 3)

C. Pew Research Center
- With AP and NWP teachers, "digital tools are being used by students to conduct research, download and submit assignments, edit work, and collaborate with each other." (p. 37)
- 95% report having students do research or search for information online. (p. 37)
- 79% report that students access assignments from an online site. (p. 37)
- 76% report that students submit assignments online. (p. 37)

DEVICES USED

A. Joan Ganz Cooney Center
- To access digital games in the classroom teachers report using a PC or mac (85%), interactive whiteboard (62%), and an iPad or other tablet (25%). (2: p. 13)

B. PBS LearningMedia
- "Tablets/e-readers saw the greatest increase in classroom penetration in the past year." (p. 12)
- Within the classroom, teachers report having access to personal computers or laptops (90%), television/DVR (80%), projectors (80%), interactive white boards (59%), handhelds (36%), tablets (35%), smart tables (11%), and game devices (10%). (p. 12)
- "Interactive white boards and pads/tablets would be the most sought technology by teachers (34% and 33% respectively), if grant money were available to them." (p. 16)
- "PCs, white boards, tablets and projectors are deemed as having the greatest potential for enhancing education." (p. 17)

C. Pew Research Center
- Within AP and NWP classrooms, teachers report having access to and using projectors (97%), a computer lab or workstation devoted to computer use (96%), cell phones (73%), digital cameras (67%), digital video recorders (55%), interactive whiteboards (52%), e-book readers (45%), and tablet computers (43%). (p. 35)
- "Tablets, e-readers and cell phones are used more often by teachers in higher income areas." (p. 36)
- Use of different devices in the classroom also varies by teacher age and subject taught. (p. 36)

Technology Use by Teacher Characteristic

COMFORT LEVELS AND FREQUENCY OF USE
A. Joan Ganz Cooney Center
- "Teachers who identify as 'very or moderately comfortable' using digital games in the classroom also use games more frequently with their students." (1: p. 4)
- "32% use games 2-4 days per week, 18% use them every day." (1: p. 4)

B. Bill & Melinda Gates Foundation
- 62% of teachers reported that personal comfort level was one of the "biggest barriers to incorporating technology into their teaching." (p. 2)

C. Common Sense Media
- "Fewer than one in five teachers consider themselves to be 'tech savvy,' but most say they are 'comfortable' with technology." (p. 20)
- "Self-described 'tech savvy' teachers are more likely to use media and technology in the classroom 'a lot' (65%) than those who describe themselves as either just 'comfortable' with technology (33%) or 'uncomfortable' with it (12%)." (p. 20)
- "Teachers who describe themselves as 'tech savvy' are more likely than other teachers to see a benefit to students' creativity from their use of entertainment media." (p. 16)

D. PBS LearningMedia
- Among total teachers, 50% claimed that they "feel comfortable experimenting with new technology as it becomes available." (p. 15)

E. Pew Research Center
- "Most teachers are 'very confident' in their ability to use the latest digital technologies, yet many also feel their students know more than they do." (p. 29)
- 56% of all AP and NWP teachers report that they are 'very confident' in their ability to learn new technologies. 39% report that they are 'somewhat confident.' 5% are 'not too confident' or 'not at all confident.' (p. 29)

TEACHER AGE
A. Bill & Melinda Gates Foundation
- "Teachers aged 45 and older are slightly less likely to use technology as regularly." (p. 2)

B. Common Sense Media
- "Older teachers and those who have been teaching for longer are more likely to say they feel uncomfortable with technology. One in four (28%) teachers who are 50 years old or older say they are not very comfortable with technologies, compared to 8% of those under age 35." (p. 20)

C. Pew Research Center
- "There are notable generational differences in how teachers experience the impact of digital technologies in their professional lives." (p. 5)
- "Teachers under age 35 are more likely than teachers age 55 and older to describe themselves as 'very confident' when it comes to using new digital technologies (64% vs. 44%)." (p. 5)
- Conversely, the oldest teachers (age 55 and older) are more than twice as likely as their colleagues under age 35 to say their students know more than they do about using the newest digital tools (59% vs. 23%)." (p. 5)

YEARS OF TEACHING EXPERIENCE

A. Common Sense Media
- "26% of teachers who have been in the classroom for 21 or more years describe themselves as not very comfortable with technology, compared to 11% of those who have been teaching for less than 5 years." (p. 20)

B. Pew Research Center
- "…63% of teachers in the earlier stages of their careers feel 'very confident' in using new technologies." (p. 30)

SCHOOL SUBJECT TAUGHT

A. Pew Research Center
- 68% of science teachers, 58% of math teachers, 54% of history/social studies teachers, and 53% of English/language arts teachers say they are "'very confident' in their ability to use digital technologies." (p. 31)
- "English teachers are the most likely to say they have students use [an online collaborative tool], often by a wide margin over teachers of other subjects. Conversely, math teachers are least likely to make use of these tools." (p. 38)
- Device use in the classroom also varies depending on subject taught. (p. 36)

SCHOOL COMMUNITY TYPE AND SOCIO-ECONOMIC STATUS

A. Bill & Melinda Gates Foundation
- "Eighty-one percent of teachers who self-identified as teaching in low-income schools said they use technology daily." (p. 2)

B. Pew Research Center
- "When looking at community type, rural teachers express the most confidence while small town teachers express the least." (p. 30)
- 60% of teachers in low-income neighborhoods are "very confident" compared with teachers from lower middle income (53%), middle income (57%), and upper middle/upper income (57%). (p. 31)

Benefits of Technology for Student Learning

INCREASED MOTIVATION

A. Joan Ganz Cooney Center
- "Nearly 70% of teachers agree that using digital games increases motivation and engagement with content/curriculum" (among lower-performing students). (1: p. 5)

B. Bill & Melinda Gates Foundation
- "Teachers believe technology tools can help students stay motivated and engage in learning more deeply." (p. 2)

C. PBS LearningMedia
- Teachers believe educational technology have the potential to "motivate students to learn" (74%). (p. 2)
- "62% say that 'technology is a new and exciting way of communicating with and motivating students.'" (p. 2)

PERSONALIZED AND INDIVIDUALIZED LEARNING

A. Joan Ganz Cooney Center
- "62% report that games make it easier for them to level lessons and effectively teach the range of learners in their classroom." (1: p. 5)
- "60% say that using digital games helps personalize instruction, better assess knowledge, and collect helpful data." (1: p. 5)

B. PBS LearningMedia
- Teachers believe educational technology have the potential to "respond to a variety of learning styles (73%)." (p. 2)

COLLABORATION AND PROSOCIAL BEHAVIOR

A. Joan Ganz Cooney Center
- 60% of teachers report that digital games help to promote "positive collaboration between students." (2: p. 15)
- 59% of teachers report that using digital games in the classroom help students to "sustain focus on specific tasks." (2: p. 15)

B. Common Sense Media
- 17% of teachers say that media has a positive effect on students' pro-social behaviors. "Several teachers commented on how their students' use of media has broadened their horizons by exposing them to diverse viewpoints and experiences." (p. 10)

C. PBS LearningMedia
- 43% of teachers believe that "technology creates an environment of greater student collaboration." (p. 9)

STUDENT PRODUCTIVITY

A. Common Sense Media
- 63% say media have helped students "find information quickly and efficiently." (p. 16)

- 34% say students' use of entertainment media has helped them "multitask effectively." (p. 16)

Barriers to Classroom Implementation

ACCESS TO TECHNOLOGY

A. Joan Ganz Cooney Center
- Cost (51%) and lack of technology resources (46%) were the top two barriers to incorporating digital games in the classroom. (2: p. 17)

B. Bill & Melinda Gates Foundation
- "Access to technology tools is by far the biggest barrier that influences a teacher's decision to use technology in the classroom." (p. 3)
- 69% of teachers report that access to computers is one of the "biggest barriers to incorporating technology into their teaching." (p. 2)
- 49% of teachers report that students' access to technology at home is one if the "biggest barriers to incorporating technology into their teaching." (p. 2)
- When students do not have access to technology in the home, teachers find it hard to effectively incorporate into the classroom because the students are "often not digitally literate enough." (p. 3)

C. PBS LearningMedia
- "Overall, more than two-thirds (68%) of teachers expressed a desire for more classroom technology and this number is even greater in low-income schools (75%)." (p. 3)

D. Pew Research Center
- "More than half (54%) say all or almost all of their students have sufficient access to digital tools at school, but only a fifth of these teachers (18%) say all or almost all of their students have access to the digital tools they need at home." (p. 3)
- "Teachers of the lowest income students are the least likely to say their students have sufficient access to the digital tools they need, both in school and at home." (p. 3)
- "56% of teachers of the lowest income students say that a lack of resources among students to access digital technologies is a 'major challenge' to incorporating more digital tools into their teaching; 21% of teachers of the highest income students report that problem." (p. 4)

TIME CONSTRAINTS

A. Pew Research Center
- "By a wide margin, the most significant challenge these teachers report facing is time constraints; fully six in 10 of these teachers say time constraints are a 'major challenge' for them personally in incorporating more digital technologies and digital learning into their classrooms." (p. 40)

B. Bill & Melinda Gates Foundation
- "Lack of time to make plans for the incorporation of technology into the classroom is another major reason why teachers shy away from using technology." (p. 3)
- 52% "report that the biggest barrier to incorporating technology into their teaching" is "time for planning." (p. 2)

EMPHASIS ON TESTING AND REFORM

A. Joan Ganz Cooney Center
- 22% of teachers report that alignment with the Common Core State standards makes certain digital games stand out. (2: p. 16)
- 38% of teachers say that the emphasis on standardized tests is also a substantial barrier to incorporating digital games in the classroom. (2: p. 17)

B. Pew Research Center
- "Second only to time is the pressure to teach assessments. More than four in 10 AP and NWP teachers describe this as a 'major challenge,' and almost as many say it is a 'minor challenge.'" (p. 41)

C. Bill & Melinda Gates Foundation
- "A general sense of education reform fatigue appears to impact teacher attitudes about using technology tools." (p. 3)
- "Many teachers say they have fatigue about the new ideas and tools teachers are expected to respond to each year, and they are struggling to embrace and use technology tools that already exist." (p. 3)

TECHNOLOGY AS A DISTRACTION

A. Joan Ganz Cooney Center
- 10% of teachers responded that "too much game play may be one of the reasons [lower-performing] students are not performing up to standard so [they] limit their access in the classroom." (2: p. 15)
- 8% of teachers believe that using digital games "often leads to behavioral issues with [their] lowest performing students." (2: p. 15)

B. Common Sense Media
- "Many teachers think their students' use of entertainment media has hurt their academic performance," including attention span, writing, homework, interpersonal communication, and critical thinking skills. (p. 7)
- While 74% report that tablet computers like iPads "will mainly help students, learn," 26% believe that "it will mainly be a distraction to students' learning." (p. 25)

C. Pew Research Center
- "71% of teachers say managing student use of cell phones and other digital tools is an issue." (p. 40)

SKEPTICISM OF THE BENEFITS OF TECHNOLOGY FOR LEARNING

A. Bill & Melinda Gates Foundation
- "Teachers are concerned about the true benefits of technology for their students. Despite recognition of the importance of technology in education, many teachers report skepticism about the actual benefits of using technology in the classroom because there is little, widely accepted proof that technology tools provide real value for student learning." (p. 2)
- "Twenty percent of survey respondents believe technology should not be used in the classroom, with 15 percent reporting strong agreement with this statement." (p. 2)

B. Common Sense Media
- "Four in 10 teachers (42%) believe that their students' use of entertainment media has hurt their overall performance." (p. 13)
- "A total of 71% of teachers say that students' media use is hurting their attention spans, ranging from 63% of elementary school teachers to 80% of high school teachers." (p. 13)
- "Overall, nearly six in 10 teachers (58%) believe that students' use of entertainment media is negatively affecting their writing, including 19% who say they think it has hurt 'a lot.'" (p. 14)
- "Four in 10 teachers (42%) say their students' critical thinking skills have been hurt somewhat or a lot by their use of entertainment media." (p. 15)

C. PBS LearningMedia
- 16% of teachers agree with the statement, "I used to be skeptical about digital media benefits, but now I am a strong supporter." (p. 9)

D. Pew Research Center
- "For many teachers, technology must add demonstrable value to justify incorporation into the learning process." (p. 49)
- "Some teachers expressed concern that technology is sometimes 'forced upon them' for the sake of 'keeping up' rather than for actually improving learning." (p. 49)

Professional Development

A. Joan Ganz Cooney Center
- The majority of teachers who use video games first learned "about using digital games from an in-service professional development (46%) followed by self-directed study (35%)." (2: p. 18)
- "Sourcing of on-going education about digital games comes from other teachers within the district (66%), being-self-taught (50%), and seminars, conferences and conventions (42%)." (2: p. 18)
- 12% of teachers reported learning about digital games "in a pre-service teacher preparation program." (2: p. 18)

B. Bill & Melinda Gates Foundation
- "Teachers seek assistance and coaching on using technology from their colleagues…From curriculum development to the practical application of technology, a peer is a teacher's first choice for help understanding, selecting, or using technology to support their teaching." (p. 2)
- 48% report that a "lack of training" is included in the "biggest barriers to incorporating technology into their teaching." (p. 3)
- "…most report they are not satisfied with the training they receive or the level of ongoing professional support they can get at their school." (p. 3)
- "Teachers say that they do not get adequate training on specific technologies or about how to more fully integrate technology into their teaching. Nearly half of survey respondents cited inadequate training as a reason they would not use technology to support their teaching." (p. 3)
- "Most teachers report that they use online resources to prepare for their work. Many also use social media tools, but do not frequently use them to connect with other teachers. Participating in professional development online—to learn more about specific technology

tools and how to better incorporate technology into their teaching—appeals to about half of survey respondents. An ideal online resource would allow them to navigate content based on peer reviews and subject and grade-level-specific categories. If this professional development tool could help teachers earn continuing education credits, it would have even greater appeal." (p. 3)

C. PBS LearningMedia
- 36% of teachers report utilizing online professional development. (p. 11)
- 23% report utilizing online communities or discussion forums for teachers. (p. 11)

D. Pew Research Center
- 68% report that their school or district provides teachers with formal training on digital technologies, while 32% report they do not receive formal training. (p. 56)
- "…teachers in schools with mainly lower income students tend to be the…least to report receiving formal training from their school or district in how to effectively incorporate digital technologies into the classroom." (p. 56)

Supports for Technology Integration

SUPPORTIVE COMMUNITIES

A. Pew Research Center
- 92% of teachers feel that the Internet and digital technologies give them "access to more material, content, and resources to use in [their] teaching." (p. 52)
- 69% believe that the Internet and other digital technologies allow them to "share ideas with other educators." (p. 52)
- "The majority of AP and NWP teachers use the Internet on a weekly basis to keep up with developments in their field and to find material they can use in lesson plans." (p. 53)
- 62% report that their school does a "good job providing teachers the resources and support they need to effectively incorporate the newest digital technologies into their curriculum and pedagogy." 38% report that their school does a poor job providing resources and support. (p. 56)
- 30% report that "lack of technical support (such as repair, troubleshooting, set-up) to use digital technologies consistently" is a major challenge. 41% report that it is a minor challenge. (p. 41)
- 68% report that their school or district provides teachers with formal training on digital technologies, while 32% report they do not receive formal training. (p. 56)

BUDGET AND SPENDING

*See Section "Barriers to Classroom Implementation." Cost is listed as one of the biggest barriers to incorporating technology into the classroom.

A. Joan Ganz Cooney Center
- "Including subscription services, how much does your classroom spend on digital games per year?"
  o 20% spend $0 (2: p. 11)
  o 3% spend $1-$19 (2: p. 11)
  o 8% spend $20-$49 (2: p. 11)
  o 12% spend $50-$99 (2: p. 11)
  o 17% spend $100 or more (2: p. 11)
  o 40% were not sure (2: p. 11)
- "Do you believe your school will allocate more, less, or the same amount of resources towards integrating digital games in classroom instruction over the next 3 years?"
  o 44% report that school will spend same amount (2: p. 11)
  o 36% report that school will spend more (2: p. 11)
  o 20% report that school will spend less (2: p. 11)

B. Bill & Melinda Gates Foundation
- Teachers "want more information about the impact of specific technology tools on student learning before choosing to invest their time and money in using a new tool." (p. 3)

C. Common Sense Media
- "As far as you know, does your school have plans to provide tablet computers such as iPads to your students in the near future?"
  o 20% report yes (p. 25)
  o 80% report no (p. 25)

Cross-Survey Synthesis

Teachers Need More Proof

In the national surveys (with the exception of the Common Sense Media Survey), teachers seem to be leaning toward the idea that technology is a helpful tool in their classrooms. They are open to using technology, currently use technology, and many desire to use more technology. Teachers are especially enthusiastic about technology when it comes to professional development, putting together classroom lesson plans, and collaborating with other teachers.

However, across the five surveys, when asked how technology is beneficial to the students' learning, there was an emphasis on learning processes and higher-level skills rather than on academic achievement. For example, teachers cite opportunities for more personalized learning, increased motivation, collaboration and pro-social behavior, and student efficiency and productivity (see Section "Benefits of Technology for Student Learning"). While all of these reported benefits would likely lead to an increase in the academic success of students, there is skepticism that technology can actually benefit test scores and achievement (see Section "Barriers to Classroom Implementation"): "For many teachers, technology must add demonstrable value to justify incorporation into the learning process" (Pew, p. 49).

While the surveys revealed that teachers find technology to be helpful with academic and collaborative skill development, it is difficult to tell if teachers believe that technology use in the classroom directly impacts performance in an academic subject. A future survey could ask teachers to make a direct connection between the skills they believe students develop through use of technology and the academic subject that they believe it will impact.

While the teachers in the Common Sense Media survey portray a less enthusiastic view of (entertainment) technology, it provides a very interesting model for exploring the ways in which technology can impact academic performance (p. 27).

Alignment with Common Core and Assessment

Teachers cite time constraints and an overemphasis on testing and reform as significant barriers to incorporating technology into the classroom (see Section "Barriers to Classroom Implementation"). However, with the exception of the Joan Ganz Cooney Center survey instrument (Q19), there is not much detail about the ways in which the Common Core Standards affect the incorporation of technology into the classroom.

In addition, the teachers in the Bill & Melinda Gates Foundation survey indicate that they believe "technology tools that are created to support effective teaching should […] provide practical ways to incorporate instruction tied to accepted teaching standards, such as the Common Core State Standards…" (p. 3). Therefore, a future survey could explore the topic of Common Core Standards in greater depth.

Teachers in the Bill & Melinda Gates Foundation survey also desire technology tools that will "provide a strong student assessment component that gives both students and teachers better insight into student learning, in real time" (p. 3). The Joan Ganz Cooney Center 2012 survey questions if and in what ways technology is valuable for assessment and testing content knowledge (Q17, Q19). However in general, there is not much detail about if and how teachers use technology to track the learning of their students. This could also contribute to the lingering skepticism that teachers face in terms of technology impacting academic achievement. A future survey could ask teachers more specific questions about whether and how technology is helpful

for assessment, which technologies they are using, and what kinds of evidence these assessments would need to provide to demonstrate that technology can positively affect academic performance.

Technology's Diverse Roles in Different School Subjects

The Pew Research Center report highlights not only differing comfort levels with technology among teachers depending on the subjects that they teach, but also different device and digital content utilization (see Section "Technology Use by Teacher Characteristic").

The Pew Research Center poses the question: "Do some subjects lend themselves more easily to the use of interactive and collaborative online tools?" (p. 38). More generally, how does the subject taught affect the teachers' ability to seek out and effectively incorporate the most appropriate technologies for their classrooms? Conversely, how do the capabilities of certain digital tools and the corresponding content available affect the likelihood of successful incorporation into the classroom?

The latter question may be especially important, as district leaders may be inclined to purchase technologies that will be useful across a range of grade levels and subject areas. This top-level decision-making will only allow for so much attention to detail in terms of which technologies are best for which subject areas.

In order to better inform the purchasing or utilization decisions of district leaders, technology experts, and teachers, a future survey could delve more deeply into the opinions of teachers of varying subject areas, especially in terms of their specific media use in the classroom, the practicality and worth of certain devices, the effectiveness of digital content as it directly relates to their subject matter, and best overall practices for using media and technology.

What Is the Child's Role in Incorporating Technology?

These surveys appropriately address the ways in which adults (district and school leaders, teachers, parents) and issues (time constraints, school environment, access to technology) affect the incorporation of educational technology into the classroom. What roles do students play?

While many teachers do feel comfortable with technology, several of them feel that their students are much more aware of technology than they are (Pew, p. 29). Are we overlooking students' roles as key integrators/facilitators of technology in the classroom?

A future survey could ask teachers how much of a role the students' opinions of and reactions to technology affect their decision to continue using it. Was there ever a time that students suggested a specific game or website to a teacher? If so, was the implementation of this game in the classroom more successful than one that the teacher suggested?

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