



**Unleashing the Future:**  
**Educators “Speak Up” about the use**  
**of Emerging Technologies for Learning**

**Speak Up 2009**  
**National Findings**  
**Teachers, Aspiring Teachers & Administrators**  
**May 2010**



## Overview

Technology has enabled students to have greater access to vast array of resources, classes and experts; empowering students to become “Free Agent Learners” who are creating meaningful personalized learning experiences 24/7 outside of the traditional classroom and school structure.


In the report *Creating our Future: Students Speak Up about their Vision for 21st Century Learning*, Project Tomorrow (2010) outlined compelling evidence that students are using technology to take responsibility for their own learning, often times bypassing traditional educational settings. As “Free Agent Learners,” students use technology to personalize their learning experience to meet their individual learning styles and interests. Students, however, are also interested in incorporating these types of learning experiences in their classroom. The students shared a vision for 21st century learning that includes these three essential elements:

- **Social-based learning** – students want to leverage emerging communications and collaboration tools to create and personalize networks of experts to inform their education process.
- **Un-tethered learning** – students envision technology-enabled learning experiences that transcend the classroom walls and are not limited by resource constraints, traditional funding streams, geography, community assets or even teacher knowledge or skills.
- **Digitally-rich learning** – students see the use of relevancy-based digital tools, content and resources as a key to driving learning productivity, not just about engaging students in learning.

With the Speak Up Project in 2009, we endeavored to better understand how educators are responding to students’ interest in a new paradigm for learning and how they may already be leveraging technology to facilitate digitally-rich learning environments where students have opportunities to learn collaboratively, with classmates or experts, anytime or anywhere. This report explores the views of teachers, principals and future teachers collected during Speak Up 2009 and highlights how they use, and aspire to use, emerging technologies for teaching and learning.

Speak Up 2009 reveals that the effective integration of technology within instruction is important to both district administrators and principals. Overwhelmingly, over 90 percent agree that the effective implementation of instructional technology is important/extremely important to their mission. In fact, over one-half of district administrators report that the use of technology within instruction is one of their most significant challenges; the type that is most likely “to wake them up in the middle of the night.” In response to this priority, district administrators are beginning to build an infrastructure that will enable teachers (and students) to create socially-based, un-tethered, digitally rich learning environments. Supporting this vision, the top technology tools that administrators believe have the greatest potential to enhance student achievement include: collaboration and communications tools, mobile computers (such as laptops and netbooks) for every student, online classes, campus wide Internet access, digital media tools and interactive whiteboards.

However, realizing this vision is not without challenges, administrators struggle to develop effective policies that enable students to gain greater access to learning resources beyond the school walls, and to secure the funding to purchase technology, provide professional staff development and offer long-term curriculum and technology support.



It is, therefore, essential that schools and districts continue to make investments in technology as the Speak Up data reveals new attitudes and values about the impact of technology on both the learner and the teacher. While many teachers are using digital media tools (66 percent), digital resources (46 percent) and games (42 percent); they are lacking access to mobile computers or devices for every student and consistent, reliable Internet access in their classroom.

Teachers tell us that as a result of using technology in the classroom students are more motivated to learn (51 percent), apply their knowledge to practical problems (30 percent) and take ownership of their learning (23 percent). Teachers also report that by using technology students are developing key 21st century skills including creativity (39 percent), collaboration (30 percent) and skills in problem-solving and critical thinking (27 percent); thus, effectively preparing them for future success in the workplace and the global society. Teachers also see changes in their teaching practice as a result of technology integration within instruction. Over one-third of the teachers tell us as a result of classroom technology they are more likely to encourage students to be self-directed, facilitate student centered learning and create more relevant and interactive lessons. The learning experience becomes more meaningful for the student as teachers have now found time to differentiate instruction (31 percent) to a greater degree, and have more access to information about how their students are doing academically (29 percent).


Since fall 2003, Speak Up has documented how students embrace the use of technology outside of school, and their desire to use the same technology to learn. Technology has enabled students to personalize their learning, collaborate with their peers, take classes online, and locate experts or resources to gain a better understanding of a subject they are studying. Perhaps, it is time that we listen to our students and utilize the technology to create opportunities that will challenge and stimulate them while nurturing their love for learning. By thinking strategically, updating our policies and leveraging the potential resources afforded through the current national and state funding streams we have a unique opportunity to re-engage students in their learning. This report, serves as a companion to *Creating our Future: Students Speak Up about their Vision for 21st Century Learning*, and highlights the views of 1,987 future teachers, 38,642 teachers and 3,890 principals and 633 district administrators collected during Speak Up 2009.

### ***About the Speak Up National Research Project and Speak Up 2009***

Speak Up is a national initiative of Project Tomorrow, the nation's leading education nonprofit organization dedicated to ensuring that today's students are well prepared to be tomorrow's innovators, leaders and engaged citizens. Since fall 2003, the annual Speak Up National Research Project has collected and reported on the views of over 1.85 million K-12 students, teachers, administrators and parents representing over 23,000 schools in all 50 states. The Speak Up data represents the largest collection of authentic, unfiltered stakeholder input on education, technology, 21st century skills, schools of the future and science and math instruction. Education, business and policy leaders report using the data regularly to inform federal, state and local education programs.

### ***Demographics of reporting sample***

In fall 2009, Project Tomorrow surveyed 299,677 K-12 students, 26,312 parents, 38,642 teachers, and 3,947 administrators representing 5,757 schools and 1,215 districts including public (97 percent) and private (3 percent) schools. Schools from urban (38 percent), suburban (31 percent) and rural (32 percent) communities were represented. Over one-half of the schools that participated in Speak Up 2009 were Title I eligible (an indicator of



student population poverty) and 42 percent have more than 50 percent minority population attending. The Speak Up 2009 surveys for K-12 stakeholders was available online for input between October 18, 2009 and December 18, 2009.

The K-12 surveys included foundation questions about the use of technology for learning, 21st century skills and schools of the future, as well as emerging technologies (online learning, mobile devices and digital content), math instruction and STEM career exploration. In addition, educators shared the challenges they encounter integrating technology into their schools and districts.

For the first time, Project Tomorrow also surveyed 1,987 college students enrolled in teacher preparation programs. Speak Up for Aspiring Teachers was open for input November 4<sup>th</sup>, 2009 through February 14<sup>th</sup>, 2010. Participating college students represented seventy-one different colleges with 69 percent of the students reporting themselves as undergraduates in education or related majors or teacher preparation programs and 31 percent in graduate programs. Of the participating colleges, 89 percent were 4-year public institutions and 6 percent were 4-year private institutions.


The Speak Up surveys for aspiring teachers sought to collect the views of the next generation of teachers on the role of technology in their personal lives as well as within their preparation programs, and their aspirations for using technology in their future classrooms. We believe that the data from this stakeholder group is important to the national discussion on how to effectively create new classrooms and learning spaces that will prepare students for future success.

The data results are a convenience sample; schools, districts and colleges self-select to participate and facilitate the survey-taking process for their students, educators and parents. All schools, districts or colleges in the United States are eligible to participate in the annual research project. To minimize bias in the survey results, Project Tomorrow conducts significant outreach to ensure adequate regional, socio-economic and racial/ethnic/cultural distribution. To participate in Speak Up, organizations register to participate, promote the survey to their constituents and schedule time for their stakeholders to take the 15-minute online survey. Starting in February 2010, all participating organizations receive free, online access to their data with comparative national benchmarks. Staff from Project Tomorrow summarize, analyze, and verify the national data through a series of focus groups and interviews with representative groups of students, educators and parents.

This report highlights the views of 1,987 future teachers, 38,642 teachers and 3,890 principals and 633 district administrators collected during Speak Up 2009, and include comparative K-12 student data findings where appropriate.

## **Creating a vision for 21st century learning**

Overwhelming, district administrators (90 percent) and principals (92 percent) report that the effective implementation of instructional technology is important/extremely important to their mission. Further analysis reveals that district administrators (60 percent) are more likely than principals (55 percent), teachers (38 percent) or future teachers (38 percent) to believe the integration of instructional technology is extremely important to their district's core mission.



Over one-half of district administrators reported that the use of technology within instruction was one of the challenges most likely to “wake you up” in the middle of the night, just below adequate funding (66 percent). By comparison, principals reported student achievement (55 percent) and adequate funding (51 percent) as their two top challenges. Integrating the use of technology within instruction ranked seventh on the principal’s list (out of 21 challenges), suggesting that district administrators are setting the pace and vision for the integration of technology within their district’s schools.

To gain a better understanding of the administrator’s vision for learning, the Speak Up survey asked administrators to reflect on Clayton Christensen’s predictions about teaching and learning, from the book *“Disrupting Class: How Disruptive Innovation Will Change the Way the World Learns,”* and to share their vision for 2019. **“What will teaching and learning look like in your school or district in 2019? What technologies will be pervasive? Will the role of the teacher be different? Will students have different expectations for learning experiences? What are you doing today that can help position your school or district to be successful in 2019?”** Interestingly, administrators painted a vision very similar to what we heard from the students:

*“In 2019, I predict that schools will be beyond the boundaries of four walls. All students in grades 2-12 will have laptops or devices that will allow any hard surface to become a computer. Anytime, anyplace learning will be the norm. Printed materials, such as textbooks and library books will be replaced with digital readers that can hold thousands of books.”* CTO/CIO/Technology Supervisor (AL)

*“Cell phones (or their replacements) will be used in the classroom. Teachers will have more technology at their disposal and textbooks will be rare.”* Principal (AL)

*“Teaching will go beyond school walls and involves exploration around the world via technology...”* Principal (AL)

*“I believe that education will finally evolve into an interactive learning process.”* Principal (TX)

In fact, when asked to design the ultimate school of the future there are several significant similarities in the top five picks for middle and high school students, principals and district administrators (see Table 1). Common elements include communications and collaboration tools and mobile computers for every student. While, online textbooks didn’t make the top five list for principals or district administrators, demand for online textbooks as a potential tool for driving increased student achievement increased from 39 percent in Speak Up 2008 to about one-half of administrators in Speak Up 2009. Likewise, online classes are a top pick for district administrators (58 percent) with only a slightly lower ranking on the priority list of principals (44 percent) and students (50 percent). Students continue to see the potential transformative impact of games and virtual simulations for learning and tell us that these tools help them connect content with the real world and give them opportunities to apply their knowledge, test their assumptions and take risks in a safe environment. By comparison, only about one-quarter of the district administrators and principals selected games and simulations for inclusion in their ultimate school.

**Table 1: Top technology picks for the ultimate school**

Middle and High School Students	Principals	District Administrators
Communications tools (61%)	Interactive white boards (60%)	Collaboration Tools (67%)
Digital media tools (60%)	Mobile computer for every student such as laptop, mini-notebook, tablet PC (58%)	Mobile computer for every student such as laptop, mini-notebook, tablet PC (66%)
Online textbooks (58%)	Communications tools (55%)	Online Classes (58%)
Mobile computer for every student such as laptop, mini-notebook, tablet PC (57%)	Digital Media Tools (54%)	Campus wide Internet Access (57%)
Games or virtual simulations (56 %)	Collaboration tools (51%)	Interactive white boards (55%)

As principals and district administrators work toward greater integration of technology into classroom instruction, their primary challenges include funding to acquire new technologies (55 percent) or update the technology infrastructure (45 percent), staff professional development (46 percent) and on-going technical support (32 percent). District administrators (31 percent) and principals (23 percent) included data collection and reporting requirements on their “top five list” of challenges. Rounding out the “top five” were assessment of technology skills (35 percent) for district administrators, while principals selected evaluating emerging technologies for classroom use (24 percent). *Given the current landscape, how do administrators move from their current state to realize their new vision for 21st century learning?* Let’s explore this further through the essential elements envisioned by the students and reported in “*Creating our Future: Students Speak Up about their Vision for 21st Century Learning*”: social-based learning, un-tethered learning and digitally rich learning opportunities.



## Essential Element 1: Social-based learning

*Students want to leverage emerging communications and collaboration tools to create and personalize networks of experts to inform their education process.*

*Administrators "Speak Up" about learning in 2019...*

***"Teachers will be facilitators, helping students with finding information and collaborative groups for learning. Students will be constructing their own learning based on experience, research and collaboration using tools that will do away with walls and physical barriers."***

*Librarian (TX)*

Students continue to tell us using technology to communicate and collaborate with their classmates and teachers helps them learn and enhances their experience. Technology has enabled students to reach out beyond the boundaries of their traditional circle of friends, classroom and school to seek new experts to add to their learning network. Ever adapting to new technologies students have moved beyond the use of email, and prefer to use communication tools that provide more instantaneous interaction such as IM or text messaging. They also communicate via their social networking profile, discussion boards and online chats (Project Tomorrow, 2010). *So how prepared are schools to provide opportunities for social-based learning?*

### ***Are educators investing in and using technology to facilitate collaboration?***

Facilitating meaningful social-based learning requires a supportive technology infrastructure, access to technology (provided by the student or school) and explicit opportunities for students to collaborate. Teachers (63 percent), principals (55 percent) and district administrators (54 percent) agree that communications tools should be an integral part of a 21st century school. Collaboration tools such as blogs, social networking sites, or wikis have a role in the ultimate school for district administrators (67 percent) and principals (51 percent); however, only 27 percent of teachers agree at this time. While administrators envision the potential for social-based learning environments, the Speak Up 2009 data suggests we're not there yet. Teachers are still more likely to communicate with their peers or students' parents (90 percent) rather than students (34 percent). However it should be noted that as we have seen with other technologies, teachers' personal use of technology tools and services often precedes the incorporation of these tools into classroom use. Interestingly, in the 2009 data we noticed a strong increase in teachers' personal use of social networking sites outside of school. In 2008, only 15 percent of teachers told us that they regularly updated a social networking site; in 2009, 48 percent are now social network users.

*Do our future teachers hold promise for creating social-based learning environments?* About one-quarter of responding future teachers report they are learning, in their teaching methods courses, how to use Internet-based (Web 2.0 tools such as, blogs, wikis, social networking and digital media) tools to facilitate collaboration between students. It appears from the Speak Up data that the primary skills being taught in the methods courses are around the use of productivity tools such as word processing, spreadsheet and database tools (53 percent).



### **How do we get there?**

Effective use of social based learning depends upon a solid infrastructure and appropriate policies that leverage the potential of these tools to improve teaching and learning opportunities for all. Echoing students’ frustrations about technology use at school, teachers also report their use of technology is circumvented by filters and firewalls (45 percent), lack of computers or tech equipment (41 percent) and slow or inconsistent Internet access (37 percent).

## **Essential Element 2: Un-tethered learning**

*Students envision technology-enabled learning experiences that transcend the classroom walls and are not limited by resource constraints, traditional funding streams, geography, community assets or even teacher knowledge or skills.*

*Administrators “Speak Up” about learning in 2019...*

***“Students can learn anywhere, home, school or on the road.”***

*District Administrator (KY)*

Students are already using mobile devices (such as cell phones, Smart Phones and MP3 players) to personalize their learning as they look up information on the Internet or access online textbooks, collaborate with their classmates, take notes, record lectures or video class presentations or experiments, or even play educational games – all without being tethered to a classroom or a computer lab. Students also are using mobile devices to enhance their personal productivity as they communicate with classmates and their teachers, receive reminders & alerts about tests and projects, organize schoolwork or create/share documents or media (Project Tomorrow, 2010). Yet, despite the increasingly widespread access that students have to these mobile devices and students’ aspirations to use them within a wide range of learning situations, students continue to find resistance from teachers and administrators about the applicability of such devices at school. Middle and high school students report in Speak Up 2009 that the #1 obstacle to using technology at school is “I cannot use my own cell phone, Smart Phone or Mp3 player.” This is in stark contrast to previous years; since Speak Up’s inception in 2003, the primary obstacle reported by students has been “school filters and firewalls that block websites that I need.” This significant change is illustrative of both the students’ increased access to the devices but also the value that students are placing on such “computers in the pocket” as a learning tool.

Revolving around this discussion about the appropriate use of both mobile devices and mobile computers at school is a larger issue of Internet and network access.

### **Opening the gates to campus-wide Internet access**

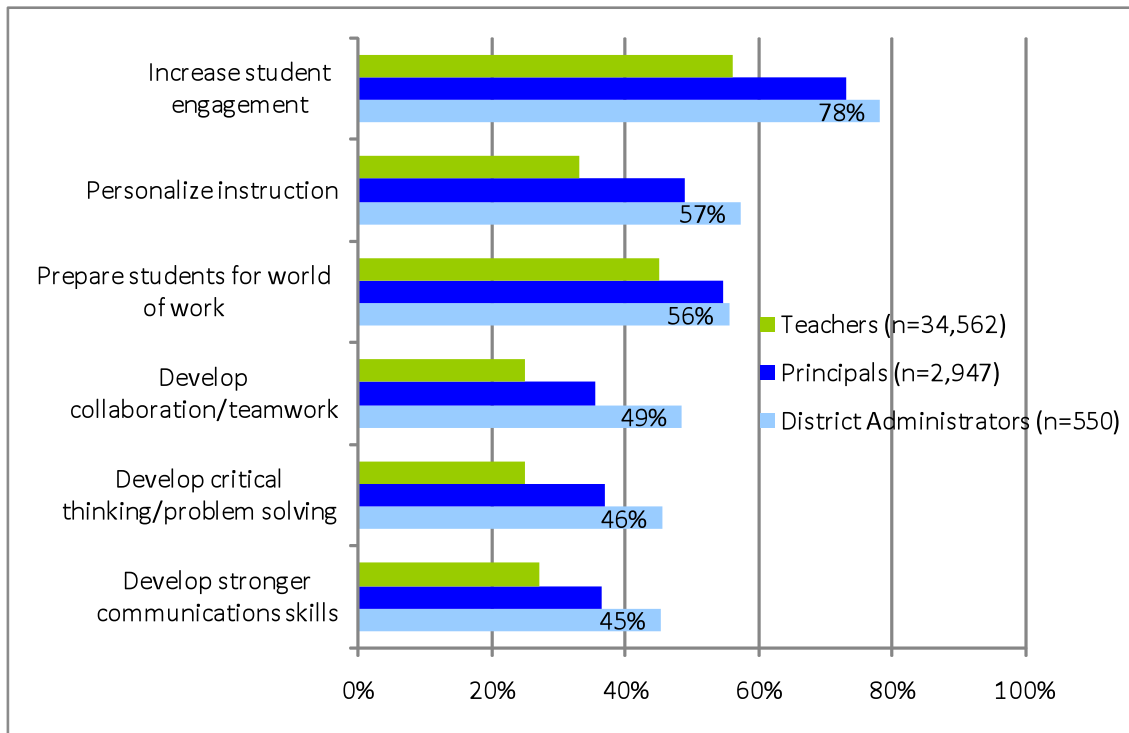
As educators move towards addressing students’ desires for un-tethered learning, administrators have to balance the competing demands of providing meaningful Internet-based learning experiences with parents’ demands and federal and state guidelines for ensuring student safety on the Internet. Principals and district administrators are equally concerned with the district’s current cell phone policies (55 percent), Internet safety and the district’s subsequent liability (45 percent) and creating acceptable use policies (30 percent).



**Unleashing learning with mobile devices**

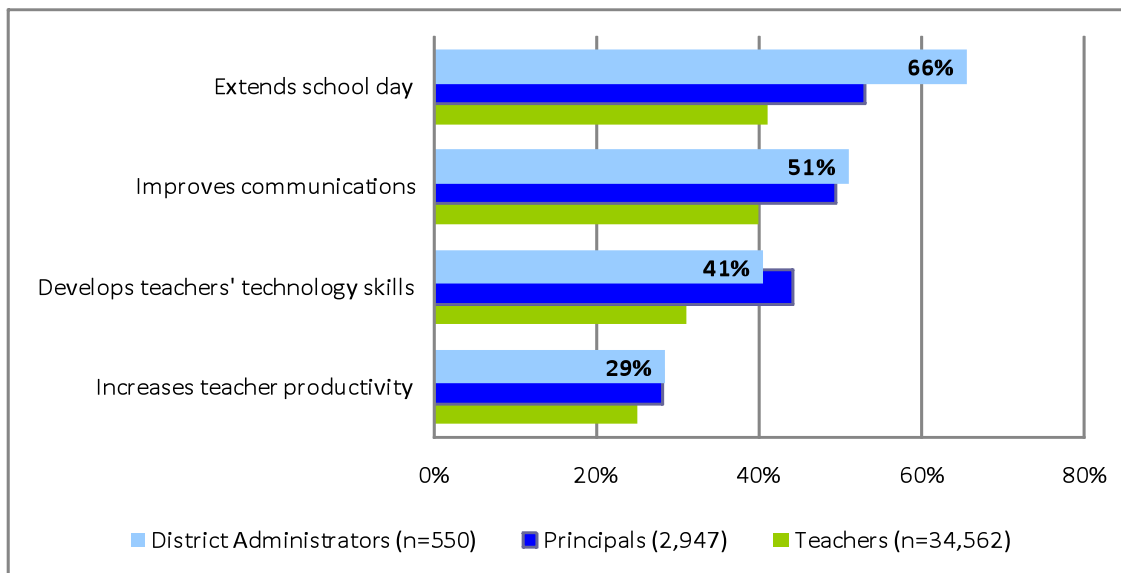
Overall district administrators are more likely than principals or teachers to recognize the value of using mobile devices for learning (Figure 1). The primary benefit cited by all audiences is increased student engagement; however, district administrators, principals and teachers to varying degrees recognize that mobile devices also support social based learning by enabling personalized learning and helping students develop work place skills in collaboration, teamwork, and communications.

**Figure 1: Educators' Speak Up about perceived benefits of using mobile devices for instruction**



Implementing mobile devices into instruction has the potential to serve a two-fold purpose by meeting both the needs of students and, at the same time, helping to develop teachers’ capacity to further integrate technology into the classroom. First, using mobile devices provides an opportunity for administrators to extend the school day; thereby meeting the students’ desire to learn anytime or anywhere. Secondly, investing in mobile devices has the potential to help teachers develop their own technical skills, and improve communications and productivity (Figure 2). *If educators are supportive of using mobile devices for learning, then what is stopping them?*

Figure 2: Mobile devices benefit students and teachers



**Mobile devices are readily available, why aren't they being used for instruction?**

Over 50 percent of middle school and high school students include mobile computers, such as a laptop, mini-notebook, or tablet PC, in the list of technology tools for their ultimate school. Even though educators see the value of integrating mobile devices into instruction, only a few teachers are currently using mobile devices (10 percent) or a laptop, mini-notebook or tablet PC (14 percent) to enhance student achievement. However, when we asked the aspiring teachers to envision their future classroom and technology use, the next generation of teachers are twice as likely to see themselves incorporating mobile devices such as cell phones, PDAs, or MP3 players (24 percent) and three times as likely to include laptops, mini-notebooks or tablet PCs (49 percent) in their future classrooms. Students’ demand for the integration of mobile computers and devices within instruction continues to grow. Yet, the majority of teachers and future teachers do not have the experience or skill to effectively integrate these devices into instruction; highlighting the need to invest in professional development to ensure that a solid foundation is created in order to realize the students’ vision for un-tethered learning experiences.

While district administrators are supportive of integrating mobile devices into the classroom, both the teachers’ (76 percent) and principals’ (44 percent) perception that mobile devices will be a distraction may influence that vision and subsequent implementation efforts. Furthermore, while students value the interactivity and accessibility of content and their peers through the devices, teachers are concerned that these highly engaging and compelling devices may cause more distractions than benefits and fear that students will surf the Internet, text friends or play games (see Table 2).

**Table 2: Educators’ biggest concerns about using mobile devices at school**


Reason	Teachers (n=34,280)	Principals (n=2,893)	District Administrators (n=535)
Students will be distracted	76%	44%	34%
Not all students have the mobile devices (digital equity)	62%	48%	52%
Concerned that students will cheat using the devices	33%	N/A	N/A
Teachers don’t know how to effectively use the devices within instruction	24%	51%	54%
Need curriculum to support the use of mobile devices	23%	37%	39%
Concerns with theft at school	N/A	56%	40%
Current district cell phone policies	N/A	56%	55%
Concerns about network security	N/A	54%	56%

Source: Speak Up 2009, © Project Tomorrow 2010

Principals report the primary barrier to implementing mobile devices within instruction is the potential theft of the devices at school. Both principals and district administrators are equally concerned with network security, and teachers’ lack of experience in using mobile devices for learning. Teachers and principals have a significant difference in their perceptions about the teachers’ ability to integrate mobile devices into instruction. About one-half of the administrators are concerned that teachers don’t know how to effectively use mobile devices within instruction compared to only 24 percent of teachers who share that same view. District administrators are slightly more concerned than principals about students having access to mobile devices.

**How will we meet students’ demand for online learning?**

Student interest in online learning has exploded over the past few years and almost three-quarters of high school students report they know someone (a family member or friend) who has taken an online class. Speak Up 2009 reveals that high school students have a wide range of experience with online classes, including classes: led by a teacher (13 percent), self-study (12 percent), or blended with a combination of online and face-to-face (8 percent). The percent of high school students taking an online class for school and personal reasons doubled from Speak Up 2008. Additionally, over one-third of high school and middle school students who have never taken an online class also express interest in taking one.



Online learning is a key component of the students' vision for an un-tethered learning environment. Yet, many students tell us that the primary barriers to actually taking an online class are a lack of information about available classes and the logistical steps for taking an online class. Simply, students need help in translating their interest in online learning into implementation and many are looking for assistance in this from their school. And while student interest in online learning continues to increase, administrators report their primary audience for online classes continues to be teachers (55 percent) followed then by students (49 percent) and administrators (32 percent). Although the primary focus for online classes is still teachers, there was substantial growth since Speak Up 2008 in the number of administrators who reported they are providing online classes for students (103 percent), administrators (66 percent) and teacher (21 percent).

Even though student interest continues to increase and administrators seek opportunities to provide online classes the number of teachers who are interested in providing online classes is not keeping pace with demand. Funding, Internet access and the capacity of the classroom teacher are the primary barriers cited by administrators to implementing online learning. Interestingly, for almost one-quarter of the responding administrators online learning is **not a funding priority** in their district and over one-third report they are limited by state funding. **Internet access** continues to surface as a barrier to implementing online classes by both principals (24 percent) and district administrators (16 percent).

In general, district administrators are more likely to be concerned than principals with their staff's ability to teach online classes (30 percent) or use the tools (26 percent) as well as the availability of standards-aligned online curriculum (19 percent) or the expertise to create online classes (24 percent).

Further aggravating the situation is the fact that few classroom teachers have taught a 100% online class (5 percent) or taught in a blended online learning situation which includes both online and face-to-face components (4 percent). Despite the lack of experience in teaching online classes, an additional one-quarter of current teachers are interested in teaching an online class. *But is that enough to meet the students' increasing interest in online learning? Who will answer the students' demand for online learning? How will administrators heed their students' vision for online learning? Will they develop their existing teachers' capacity to teach online courses or look to their newest recruits?*

Aspiring teachers provide another opportunity for school districts to meet the pent-up student demand for online classes. Aspiring teachers (21 percent) view online classes and learning management systems (44 percent) as viable options for enhancing student achievement. Likewise, over one-half of the administrators want aspiring teachers to have experience participating in an online class before they complete their certification process. At this point less than one-quarter of the administrators, however, say it is important for aspiring teachers to have the skills to teach an online class and only 4 percent of aspiring teachers report they are learning how to teach online classes in their methods courses. **Unless educators' invest in developing both the existing and aspiring teacher's interest and capacity to facilitate online classes, demand will continue to outpace supply in the traditional K-12 setting.**

## Essential Element 3: Digitally-rich learning experiences

*Students see the use of relevancy-based digital tools, content and resources as a key to driving learning productivity, not just about engaging students in learning.*

*Administrators “Speak Up” about learning in 2019...*

***“The availability and effective use of digital resources will be an integral part of each classroom and the curriculum. It is still new and the learning curve is steep.***

***By 2019, I expect that it will be a routine part of the instructional process.”***

*Elementary School Principal (CA)*

Today’s students are immersed in the use of digital media tools and content at home and school. At school, the Speak Up data reveals that students prefer to use a wide range of digital media tools to create slide shows, videos or web pages, as well as learn through a digitally rich curriculum that incorporates educational games, virtual experiments or simulations and in 3D virtual reality worlds. When designing their ultimate school both middle and high school students include digital media tools (60 percent), digital resources (51 percent) and games or virtual simulations (60 percent and 52 percent respectively).

About one-half of the district administrators and principals concur that digital media tools, digital resources and online textbooks have the greatest potential to increase student achievement. However, only about 25 percent of administrators agree that games or virtual simulations are a “must-have.”

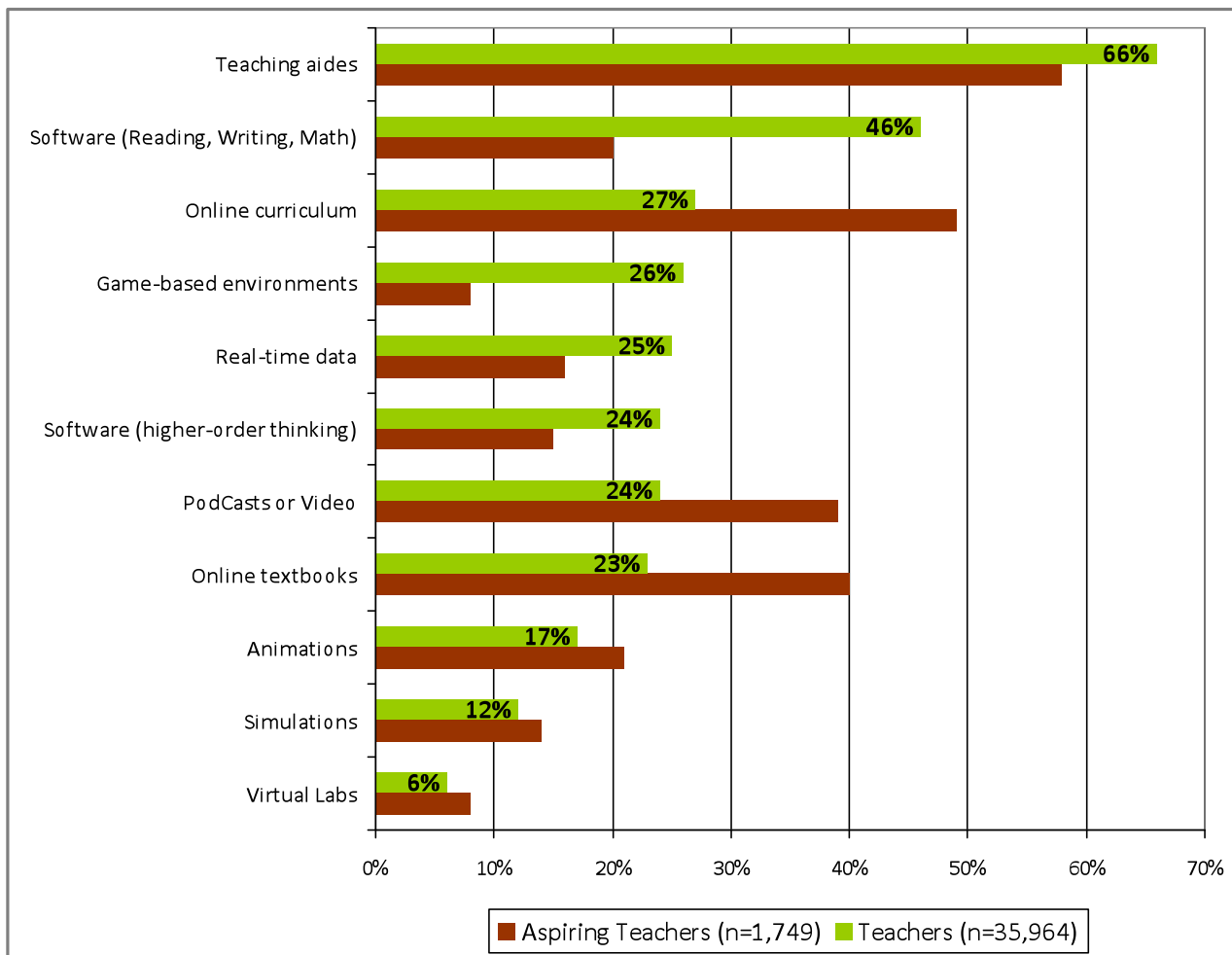
### ***What digital resources are being used in the classroom?***

As more students continue to seek opportunities to use digitally rich curriculum, the Speak Up data illustrates that for teachers their primary use of digital resources is through teaching aides (66 percent) or software to help students develop skills in reading, writing and math (46 percent). Less than one-quarter of the teachers are effectively leveraging the power of digital resources by using game-based environments, podcasts or video, real-time data (such as: population, weather, NASA, GOOGLE Earth, GIS) and software to help students develop higher-order thinking skills. Even fewer teachers are utilizing animations (17 percent), simulations (12 percent) and virtual labs (6 percent) in their classrooms. In the context of the national discussion about how to effectively ignite a new generation of scientists, engineers and technologists, it is especially concerning that many teachers are still not effectively leveraging these 21st century tools to compensate for inadequate lab equipment or tools to teach inquiry-based science.

Our future teachers are learning techniques for incorporating digital media both formally through their methods classes, and informally, as they observe their professors teach (68 percent) and study K-12 teachers’ use of the tools in actual classrooms (76 percent). When asked which **experiences would best prepare them to teach in a 21st century classroom**, the college students’ top five picks include learning how to use technology to differentiate instruction for students (75 percent), incorporating digital resources in a lesson (68 percent), locating and using electronic teaching aides (67 percent), creating and utilizing video or podcasts within a lesson (57 percent) and using electronic productivity tools (57 percent). About one-quarter express interest in learning how to incorporate mobile devices within instruction, using social networking sites or social networking tools to teach.

The Speak Up data reveals a disconnect between the strategies college students are learning in their teaching methods classes and the technology that teachers are currently using in the classroom to enhance student achievement (Figure 3). Currently, our future teachers are being trained to use word processing, spreadsheet or database tools (53 percent), create multi-media presentations (44 percent), and find digital resources such as videos, podcasts or digital images to include in a lesson (40 percent).

**Figure 3: Should we prepare our aspiring teachers to use the same technologies being used in the classroom today or for a future vision?**



To a lesser degree, these same college students are also learning to create electronic portfolios of student work (31 percent), create videos, podcasts or websites to teach a topic (28 percent), and use animations, simulations or games within instruction (19 percent). Additionally, through their coursework, these future teachers interact with online curriculum (49 percent), online textbooks (40 percent), animations (21 percent) and simulations (15 percent). Less than 10 percent of our future teachers are experiencing the value of using game-based environments or virtual labs in their methods courses.

In spite of the lack of formal training in their teacher preparation programs about how to effectively incorporate games, virtual simulations or animations, this new generation of teachers continues to see the value of these

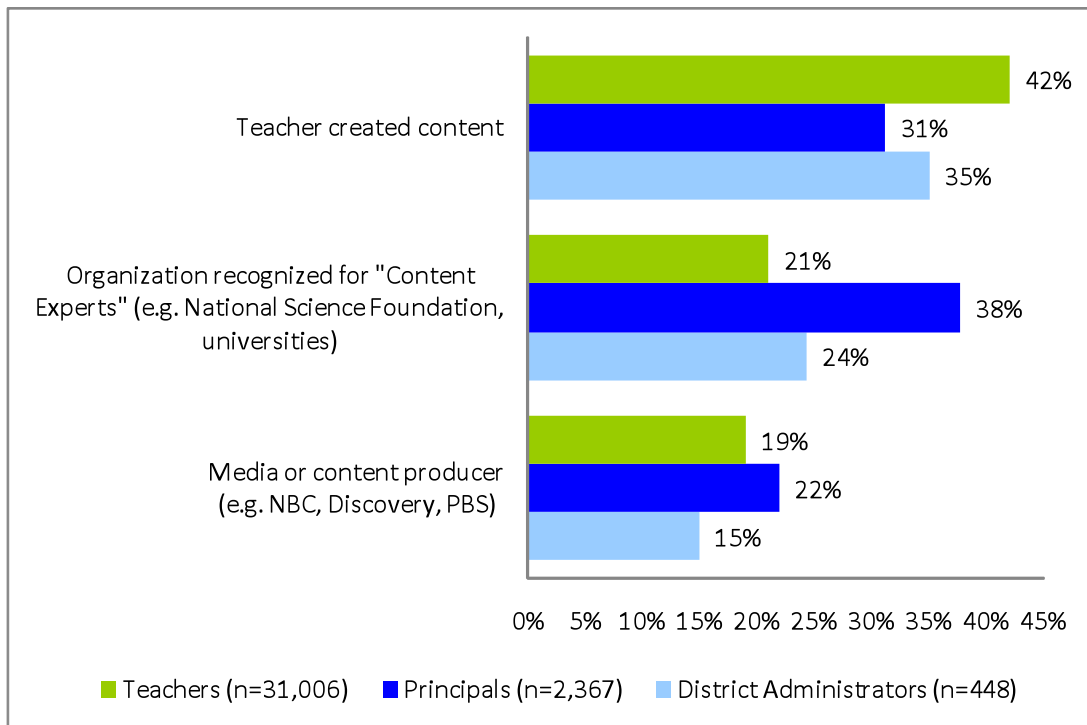
tools and aspires to include them in their future classrooms; highlighting how their own personal experience serves as a model for the potential possibility.

When designing their ultimate school, future teachers are more likely than the veteran classroom teachers to include digitally rich resources into their classrooms (Table 3). Across the board, these future teachers are more likely than existing classroom teachers to desire digital media tools, digital resources such as, databases, electronic books, animations, or videos, and flip cameras in their classrooms. Future teachers also envision games, virtual simulations and video conferences or webinars in their classrooms. This new generation of teachers is also five times more likely to use electronic portfolios for their students; once again, illustrating the natural affinity they have towards technology that will enable them to create digitally rich learning experiences.


**How are digital resources being evaluated?**

Administrators and teachers evaluate the quality of resources using a variety of criteria including who published the digital content, who recommended the digital resources, expected student outcomes and price. Teachers are most likely to select digital resources created by a practicing teacher (Figure 4). Principals and district administrators place a greater value on content that is developed by an organization recognized for its content expertise, such as the National Science Foundation or universities than teachers do; principals have the strongest preference for resources steeped in content expertise. Information about student achievement and teacher “approved” status are important to both district administrators and principals.

**Figure 4: Teachers prefer using digital resources created by other teachers**



Teachers continue to rely on “word of mouth” when determining which digital resources to incorporate into their instruction, over 40 percent depend on referrals from colleagues followed by recommendations from certified



education membership associations (27 percent), education blogs or websites (20 percent) or their state department of education (19 percent).

### ***Barriers to implementing digital resources***

As digital resources become more widely available administrators are less concerned about locating free appropriate digital resources (9 percent) and more concerned with training teachers about how to effectively use digital resources (43 percent), providing computers (35 percent), and securing funds to purchase digital materials (30 percent). District administrators are also concerned that they do not have the staff to identify or create digital resources that meet their standards.

### ***How do we get there?***

Although teachers continue to report barriers to using digital resources, we are beginning to see in our Speak Up 2009 data findings that teachers are starting to transform their vision for 21st century classrooms into a reality. In Speak Up 2009, teachers reported using digital media tools (66 percent), digital resources (46 percent) and games (42 percent) to enhance student achievement. By comparison, in 2008 when teachers were asked to design their ultimate school and identify technology that would hold the greatest potential for student achievement, only 32 percent chose digital media, 35 percent chose digital resources and 21 percent identified games. This significant year to year growth from vision to implementation indicates that teachers are open to the idea of incorporating more digitally rich learning experiences into their classrooms – and also that the usage of these tools by students in school and at home may be driving greater adoption by the teachers.



## Ending Thoughts


Meeting students’ desires for socially-based, un-tethered, digitally rich learning experiences requires educators to address head on key infrastructure and funding challenges, policies around technology use and in particular, the use of students’ personal devices, and the ongoing need for new approaches for training teachers, both in-service and pre-service. Similar discussions about how to meet these challenges are taking place throughout the country from the halls of Congress to local school board meetings.

Campus wide interactive Internet access is at the cornerstone of the new student vision for learning, supported by the ability for students to access their work and classroom resources anytime and anyplace. To fully implement the vision however, teachers need meaningful opportunities to learn how to effectively integrate emerging technologies such as mobile devices, online learning and digital resources and explore new strategies for using technology to facilitate collaboration amongst their students. Additionally, it is equally important that schools, districts and universities (including schools of education) collaborate to identify effective digital resources that will not only engage students in learning and enhance student achievement but also, utilize the technology to transform teaching practices for greater impact and productivity.

As administrators develop their strategic plans and evaluate alternatives for investing in technology, it is also important to consider the voice of the college students who are currently enrolled in teacher preparation programs. Perhaps, because they too grew up as digital natives, this new generation of teachers brings a different set of experiences and perspectives. These budding professionals appear to be poised to leverage a wide range of emerging technologies within their future classrooms (Table 3); however, their formal training highlights a need to provide additional guidance to help them effectively leverage the technology for learning. These future teachers recognize the

**Table 3: Key technology tools for facilitating 21st century learning**

	Future Teachers (n=1,729)	Teachers (n=35,964)	Principals (n=2,462)
<b>Social-based Learning</b>			
Collaboration tools	82%	27%	51%
Communications tools	67%	63%	55%
Virtual or online whiteboard	37%	6%	29%
<b>Un-tethered learning</b>			
Campus wide Internet access	82%	80%	47%
Mobile computer for every student (laptop, mini-notebook, tablet PC)	49%	14%	58%
Mobile devices (cell phones, PDA, MP3 player)	24%	10%	34%
Online classes	21%	10%	44%
<b>Digitally rich curriculum</b>			
Digital media tools	79%	66%	54%
Digital resources	59%	46%	42%
Electronic portfolios for students	54%	10%	49%
Games	52%	42%	25% includes virtual simulations
Online textbooks	43%	19%	47%
Virtual simulations	27%	5%	N/A



importance of using tools for facilitating social based learning, such as collaboration and communications tools or virtual whiteboards. They also recognize that campus wide Internet access and mobile computers are a requirement to providing un-tethered learning. Lastly, they recognize that teaching aides and videos are only one aspect of digital content and that we will truly unleash learning and create more robust, meaningful experiences for students when we use games, online textbooks or virtual simulations. Finally, they are looking at assessment in new and different ways through electronic portfolios.

While, these future teachers have a desire to integrate the technology to support socially-based, digitally rich curriculum in their classroom, they are primarily being taught to use technology for word processing, spreadsheet, database tools or multi-media presentations. Less than 25 percent of these future teachers are being taught core skills which will enable them to leverage the power of technology for student achievement with online assessments, the use of student achievement data to inform instruction, or facilitate collaboration amongst students using Internet-based tools (such as blogs, wikis or social networking tools). Even fewer are learning how to teach online classes (4 percent).

As we continue our local and national discussions about creating learning environments that will engage students and enhance student achievement, perhaps we should begin to ask: *are our schools and districts ready to accommodate the desires that this next generation of teachers have for truly 21st century, technology-enabled and empowered classrooms?*

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