Leadership in the 21st Century: The New Visionary Administrator



"We want technology to be almost a thoughtless, seamless process. When you go to a classroom, you pick up a piece of chalk. Technology should be as automatic as picking up the chalk. The newer teachers are expecting it and our students are expecting it when they come into the classroom."

Irving (Nick) Nicholson director of eLearning programs Chicago Public Schools







EXECUTIVE SUMMARY

Since 2003, more than one million students have chosen to "Speak Up" about technology, education and their expectations for the future. Students in all grades from more than 14,000 schools in all 50 states and U.S. schools abroad have completed the Project Tomorrow Speak Up online survey, creating the largest collection of authentic, unfiltered stakeholder input on education.

According to Marc Prensky (2001b), "... today's students *think and process information fundamentally differently* from their predecessors." They are "digital natives," born into the digital age, while adults are "digital immigrants," adapting their skills and thinking processes to a new world. These digital natives have fundamentally different expectations of access and interactions with technology. Over the past five years, Project Tomorrow has substantiated this disconnect through student, teacher and parent surveys.

In fall 2007, 70% of students (grades 6-12) defined their technology skills as average or "about the same as their peers," 23% believe they are more expert than their peers, and 5% consider themselves beginning. Overall, 74% of 6th-12th grade students report that good technology skills are important to future success, and half of the 6th-12th grade students say that their school is *not* doing a good job preparing them for 21st century jobs. When asked how their school could make it easier for them to work electronically, almost two-thirds of middle and high school students said, "let me use my own laptop, cell phone or other mobile device at school."

Although students represent the majority in a school district, they often have very little say in the design and operation of their learning environment. Administrators decide how students spend their time at school. They control resources, set policies, define curriculum, and manage staff. They balance educational vision with the needs of the community as well as federal, state, and local mandates. To better understand administrator attitudes about technology and learning, Project Tomorrow added a school leader survey to the Speak Up project in 2007. While administrators' responses generally confirmed the digital disconnect, one group of administrators seem to be bridging the gap.

The Speak Up data shows that administrators who are most concerned about technology integration have more in common with students than with fellow administrators in terms of technology use and priorities for integrating technology in instruction. These "visionary administrators" hold many different administrative positions at schools and district offices and do not only represent technology professionals. Yet, they share a common concern about helping students develop 21st century skills and measuring their achievement in this area. They believe that seamless, ubiquitous technology, when effectively integrated into learning, has the potential to expand the classroom walls, transform the pedagogy, and help students better prepare for life in the 21st century. The visionary administrators have begun to adapt to the culture of the new digital world and have the vision to transform schools. "We want technology to be almost a thoughtless, seamless process," said Irving (Nick) Nicholson, director of eLearning programs, Chicago Public Schools (IL). "When you go to a classroom, you pick up a piece of chalk. Technology should be as automatic as picking up the chalk. The newer teachers are expecting it and our students are expecting it when they come into the classroom."

This report examines the responses of visionary administrators and compares it with feedback from their peers as well as students. Interviews with nine visionary administrators representing four school districts and three schools helped verify survey results and explain answers. Key findings include:

- Technology management has evolved from a district business service to a core instructional service where technology administrators work closely with curriculum and instruction staff to analyze needs and plan strategically. Almost all visionary administrators (93%) believe that using technology improves student achievement.
- When asked what challenges wake them up in the middle of the night, visionary administrators (46%) were more likely to select the incorporation of 21st century skills into instruction than administrators generally (28%).
- Visionary administrators were the only group more likely to self-rate their technology skills as more advanced than their peers (58%) compared to the same as peers (39%) or less developed (just 3%). As decision makers, they have the opportunity and the experience to help usher in a new culture of learning with seamless integration of technology, reducing the digital disconnect for students.
- Visionary administrators do not just talk about technology, they are often twice as likely as their peers to use it, closing the digital disconnect with students. For example, they are more likely than students to remix content (29% vs. 20%) and read or post blog or wiki entries (56% vs. 19%).
- When selecting features of the ultimate 21st century school, visionary administrators had more in common with students than with their administrator peers. They were 20% more likely to select access to digital equipment for creating multi-media projects, interactive whiteboards in every classroom, online databases for research, online tools to streamline communications between teachers, parents and students, and online classes.
- Administrators agreed on the top technology implementation challenges: funding, professional development, and evaluating emerging technologies. Visionary administrators were significantly more likely to identify assessment of technology skills as a challenge (42% vs. 30%). Interviews show how visionary administrators leverage local resources, local talent, different funding strategies, and a range of technology solutions to overcome these challenges. When asked which metrics proved most effective in measuring the impact of technology on student achievement, a strong majority (64%) of visionary administrators favored 21st century skills measurements and achievement on state assessments a close second.
- Visionary administrators are leading the introduction of online learning and mobile devices into the classroom by supporting teacher exploration of new tools. Over half of all visionary administrators say that they would provide or expand online courses to keep students engaged in school. With regard to mobile devices, 76% of visionary administrators believe that they will increase student engagement, and equitable access concerned 37% of visionary administrators.

We hope this report starts a conversation in your school or district about progress towards a 21st century learning environment.

Speak Up Survey Methods

This report presents the findings from Project Tomorrow's 2007 Speak Up Survey, informing international discussions about how to create 21st century classrooms that engage today's "digital natives." Project Tomorrow collected survey responses from all 50 United States, the District of Columbia, American Department of Defense Schools, Canada, Mexico, and Australia. The top participating states included: Texas, California, Arizona, Illinois, Alabama, Maryland, North Carolina, Pennsylvania, Florida, and Michigan.

In 2007, Project Tomorrow surveyed 319,223 K-12 students, 25,544 teachers, 19,726 parents, and 3,263 administrators. Respondents came from 3,729 schools and 867 districts with 97% from public institutions and 3% from private schools. Schools were located in 32% urban, 40% suburban, and 29% rural communities. Forty-three percent of the schools were Title I eligible, and 29% had a more than 50% minority population attending.

A school's capacity to change and meet the dynamic needs of its stakeholders depends on decisions made by administrators today. The principal's actions, interests, and priorities often determine whether or not a program of change succeeds (Redish, n.d.). Gerald Beimler, director of IMPACT end user support, Chicago Public Schools (IL), finds that principals ask for technology or technology training when they have a clear vision of a teacher who will use it. "Whenever a principal requests a set of student response systems to anonymously collect cumulative classroom student data," said Beimler, "we know that the principal envisions teachers who know what to do with it. When principals request additional teacher training on utilizing our district's IMPACT Curriculum and Instructional Management system, we find that the principal has a vision of how teachers will use that information."

In order to gain a better understanding of the attitudes, practices and policies of administrators who are leading the transformation of 21st century schools, the data was further disaggregated to identify "visionary administrators." These administrators were identified as "visionary administrators" based upon several defining characteristics including their prioritization of the use of technology within instruction and that the effective implementation of instructional technology was extremely important to their school's or district's core mission. In addition to the survey data, Project Tomorrow interviewed nine visionary administrators representing four school districts and three schools to learn more about their vision for 21st century schools, professional practices, as well as successes and challenges. The report compares responses of visionary administrators to "other administrators," those school and district administrators who participated in Speak Up but did not share the same defining characteristics as the visionary administrators.

Profile of a Visionary Administrator

While technology professionals comprised over 40% of visionary administrators, many visionaries held a variety of important roles, in fact, 40% were school leaders. Other titles included district curriculum specialist and superintendent. Mary Cassidy, principal of Indialantic Elementary School (FL), considers her tech skills average, yet she oversees a technologically advanced school. "My view on technology is to surround myself with very competent people and avail myself of them as resources," she said.

Of the visionary administrators, 72% held key roles at school sites and 28% were in district administration. Their school location mirrored the general population with 42% suburban, 27% rural, and 21% urban. One-third of the visionary administrators come from Title I eligible schools, and 18% of their schools have more than 50% minority population attending. Three out of five participants were female, 36% were male and the rest declined to respond. Eighty-four percent of visionary administrators had four or more years of experience, and the largest portion of participants (55%) had a master's degree in education.

Almost all of the visionary administrators (93%) believe that using technology improves student achievement, an opinion shared by most students, teachers, and parents as well.



Almost all of the visionary administrators (93%) believe that using technology improves student achievement, an opinion shared by most students, teachers, and parents as well. "The most exciting thing for me is seeing the impact on kids," said Kevin West, principal, Canyon Ridge School in Surprise, AZ. "You feel it when you enter the classroom. Students are motivated and excited about school. They enjoy learning this way. Teachers are extremely innovative and have the desire to learn themselves. They've been taking risks with themselves and it's remarkable to see how they come together and collaborate."

Preparing Students for the 21st Century

Five years of Speak Up surveys show that student expectations at all grade levels have changed (Project Tomorrow, 2008). Younger students have greater access to technology and higher expectations for their learning environment than older students. They are learning to navigate the media-rich, instant-access, global community every day of their lives.

"A big part of their life will be online," said Jeff Billings, district technology coordinator, Paradise Valley Unified School District (AZ). "How do you learn to cooperate, compete, collaborate? You can't learn it from a book. You have to get your feet into it."

21st Century Realities

Whether or not schools have prepared students for this dynamic world is still an open question. When asked about preparing students for the 21st century, Paul Caputo, supervisor of curriculum technology and federal programs for North Schuylkill School District in Ashland, PA, said: "It means providing them with the communication skills they'll need to be successful; the math and reading skills they need to compete globally. We need to make sure that our curriculum is rich enough and diverse enough to attend to different learning styles."

Much work has been done to define "21st century skills" including the *Framework for 21st Century Learning* (Partnership for 21st Century Skills, 2004) and many schools have begun the work of revising curriculum, integrating technology, and changing pedagogy to address this shift. When asked about the success of these measures, 63% of visionary administrators at the district level and 50% of school site visionary administrators believe they are successfully preparing students for 21st century jobs. Yet, the majority of middle school and high school students who self-rated themselves as advanced compared to their peers reject that notion. Perhaps the majority of these students represent a growing uncertainty about what 21st century jobs will require.

About 23% of district visionary administrators were not sure. Beimler, a district leader of Chicago Public Schools (IL), admitted that, in his opinion, 21st century learning skills continue to change. "In 1998, I'd have said yes. But I'm having trouble helping to define the skills for jobs that don't exist." Nicholson of Chicago Public Schools (IL) agreed: "I would have answered unsure, because I don't know."

"We're focused on thinking skills that kids need to develop," said West of Canyon Ridge School (AZ). "We want them to be creative, innovative, problem solvers. We want them to be collaborative. We're not just teaching the standards, we teach for deep understanding so they can take this content and make connections across disciplines. We promote leadership and personal responsibility skills."

Challenges of Greatest Concern

When asked what challenges wake them up in the middle of the night, visionary administrators, by definition, are all concerned about use of technology within instruction (compared to 39% of other administrators). In addition, visionary administrators (46%) were more likely to select the incorporation of 21st century skills into instruction than other administrators (28%). The other top challenges more closely matched the general administrator population and included adequate funding (54%), achievement on standardized tests (49%), and selection of effective instructional materials. School site visionary administrators expressed more concern about achievement and school safety, while district visionary administrators more frequently selected funding. The combined concern about technology within instruction and 21st century skills suggests an emerging role for visionary administrators in the transformation of schools.

The Digital Disconnect?

To better understand the role of technology in participants' lives, the Speak Up survey asks participants to self-rate their technical proficiency compared to their peers and to indicate what types of technology they use on a regular basis (see Figure 1). Visionary administrators were the only group more likely to self-rate as advanced than average or beginning.

Each year, the majority of students rate their skills as average and only about one-quarter of students feel that they are advanced. However, the types of activities these digital natives engage in regularly might be considered advanced by the digital immigrants in their midst. Most administrators regularly email or IM their peers (94%) and 30% email a student. However, students are almost as likely to maintain a site on MySpace or Facebook (67%) as they are to email (74%) or IM (64%). Interviews with students suggest that they have moved beyond email, a skill once considered essential to technology literacy and success in the workplace.

The visionary administrators do not just talk about technology, they are often twice as likely as their peers to use it. While they have not caught up to students' use of social-networking sites like Facebook and MySpace, 48% of visionary administrators do participate in online communities. Visionary administrators are almost as likely as students to participate in virtual reality environments and a quarter of the advanced visionary administrators play online games. Visionary administrators regularly use technology to create multimedia presentations (84%), create or listen to podcasts or videos (55%), download music (45%), and personalize newsfeeds (21%). Advanced visionary administrators are more likely than students to remix content (29% vs. 20%) and read or post blog or wiki entries (56% vs. 19%).



The visionary administrators have clearly embraced the tools of the digital world. As school decision makers, they have the opportunity and the experience to help usher in a new culture of learning with seamless integration of technology, reducing the digital disconnect for students.

The Ultimate 21st Century School

When asked to select the ideal characteristics of a 21st century school, visionary administrators were more likely to share priorities with students than with their peers. Every year, more students choose one-to-one laptops than any other item on the list. Laptops proved to be a top pick for more visionary administrators (72%) than other administrators (61%) (see Figure 2: Tools that hold the greatest potential for increasing student achievement in 21st Century Schools).

More than half of visionary administrators believed that 21st century schools should have digital equipment for creating multi-media projects, interactive whiteboards in every classroom, online databases for research, online tools to streamline communications between teachers, parents and students, and 43% favored online classes. Visionary administrators were 20% more likely to select these features than their peers.

Furthermore, visionary administrators who rate themselves as advanced tech users were more likely to value Web 2.0 tools such as blogs, wikis, and social networking sites in 21st century schools (38% compared to 21% for their less tech proficient peers). While visionary administrators who rate their skills as less developed than their peers more frequently selected interactive whiteboards (72%), access to online databases (69%), and career technical classes (59%) in their ultimate 21st century school.



It is interesting to note that visionary administrators in rural schools (59%) and suburban schools (57%) are more likely than their urban counterparts (36%) to see the benefit of interactive whiteboards in every classroom. Additionally, visionary administrators in rural schools are leading the charge when it comes to implementing mobile devices (54% versus 46% in suburban and 36% in urban schools).

Paul Caputo of North Schuylkill School District (PA) sees interactive whiteboards, thin clients, and mobile devices as key technologies to making sure that rural students have the same opportunities as their peers at larger, more affluent districts.

Over the past five years of collecting and analyzing student data, Speak Up has found that student support provides an early indicator of coming technology trends for instruction (see Figure 3: Trends to Watch). Over 50% of students in grades 6-12 would like to see more educational gaming in their 21st century school; only 19% of visionary administrators endorse this concept. Student response systems received a strong endorsement from 40% of students and 31% of visionary administrators, compared to 22% of other administrators. Visionary administrators (45%) agreed with 53% of middle and high school students about incorporating mobile devices within learning. And finally, 25% of visionary administrators and 34% of students indicated that school portals hold great potential for increasing student achievement for 21st century learners. Visionary administrators were 37% more likely to select these features than their peers.



Persistent Challenges to Technology Integration

Students and visionary administrators agree: technology used within instruction enhances student achievement and schools should provide seamless access to computing and communication tools. Research shows that students do not just crave access; they expect an integrated learning experience. "They are used to the instantaneity of hypertext, downloaded music, phones in their pockets, a library on their laptops, beamed messages and instant messaging. They've been networked most or all of their lives. They have little patience for lectures, step-by-step logic, and 'tell-test' instruction" (Prensky, 2001a).

Current research illustrates that administrators must keep their eye on the factors that foster successful implementations, as well as the technology adoption process. Based on research and input from the field, the **essential conditions for technology integration** include: shared vision, implementation planning, consistent and adequate funding, skilled personnel, ongoing professional learning, technical support, student centered learning, engaged communities, support policies, and supportive external context (ISTE, 2002).

Students and visionary administrators agree: technology used within instruction enhances student achievement and schools should provide seamless access to computing and communication tools.

This idea is further articulated through the Levels of Technology Implementation (LoTI) scale developed by Chris Moersch (1994). This framework highlights the stages teachers advance through as they integrate technology into their instructional practice. Teachers typically begin by using technology for management tasks or teacher-directed lessons (level 1). They then explore how technology can be used to extend or enrich learning (level 2); develop higher-order thinking skills (level 3); provide a "rich context" for students to understand concepts, themes, and processes (level 4); extend the classroom outside of school (level 5); or create student-center classrooms – where students use technology to find solutions of significance to them (level 6).

The Speak Up survey asked administrators to identify the most challenging issues they faced when integrating the use of technology within instruction. The top four implementation challenges revealed by the Speak Up data were shared by all administrators (see Figure 4) and consistent with the technology implementation factors outlined by ISTE. They included: funding to acquire new technologies, professional development, funding to update technology infrastructure, and evaluating emerging technologies for classroom use. Visionary administrators were significantly more likely to identify assessment of technology skills as a challenge (42% vs. 30% of other administrators). Administrators also cited technology support or data collection and reporting requirements (34% for each category) as challenges.



Further analysis of the data revealed that the challenges varied based on the administrators' self-rated technical proficiency. For example, visionary administrators who self-rate as more advanced than their peers are more concerned with technical support (45% for advanced, 40% for average, 14% for beginning), digital equity issues (26% for advanced, 15% for average, 3% for beginning), and funding to acquire new technologies (62% for advanced, 61% for average and 41% for beginning). Rural visionary administrators (see Figure 5) are more concerned than their counterparts in urban and suburban areas with funding to acquire new technologies (75% vs. 59% suburban and 63% urban), professional development (74% vs. 62% suburban and 63% urban), and assessment of technology skills (53% vs. 41% for both urban and suburban).



Interviews with visionary administrators confirmed the double hurdles of funding and professional development. In addition, they shared strategies and lessons for addressing the other essential conditions for implementation. Their stories serve as both consolation and inspiration with many strategies and lessons for transforming our schools.

Consistent and Adequate Funding

Cheryl Davis, district curriculum and instruction technology specialist, Acalanes Union High School District in Orinda, CA, is doing all the right things to achieve the conditions outlined by ISTE for technology integration: educating administrators, creating a strategic plan with a technology component, reaching out to parents and the community. "We are plotting out how to implement it," she said. "What stops us is the funding component. With the reduction of education funding in the current California budget proposal, we had to cut our technology budget to keep other classroom programs going. We don't qualify for most grants."

For Brian Eyer, principal of Digital Harbor High School in Baltimore, MD, funding to support his school's program keeps him up at night. "With our program, supporting our technology infrastructure, repair and maintenance is huge," he said. The model school helps all students graduate college and career ready with technology certifications.

Funding did not come up as an issue during an interview with the eLearning department of Chicago Public Schools (IL). When asked why, they realized that funding was such a given, they did not bother to list it. Beimler asked his colleague, "What percent of our budget comes from some type of grant?" and Nicholson quickly replied, "That would be 100%."

Ongoing Professional Learning

The importance of professional development to technology integration makes sense in a world where digital immigrants are the teachers and digital natives are the students. The traditional, teacher-centered approach to learning means that the teacher has more expertise and knowledge than the student. The new technology-enhanced learning environment puts more emphasis on student-centered, performance-focused learning (ISTE, 2008). Every visionary administrator interviewed talked about making teachers feel "comfortable" with using technology.

"We have to get all of the teachers developed and comfortable," said Billings of Paradise Valley Unified SD (AZ). He believes that many instructional technology tools have become easier to use and that, equally important to training teachers to use tools, is finding tools that work well. Many previous programs "weren't quite good enough."

"One part of my job which has the most impact is helping teachers feel comfortable to involve students," according to Debbie Fry, network/technology services associate, Indialantic Elementary School (FL).

Kevin West, of Canyon Ridge School (AZ), described the challenge from the digital natives' perspective: "Kids are very comfortable with the tools. It's highly engaging and highly motivating for kids."

"We want to bring about a shift in pedagogy," said Caputo of North Schuylkill SD (PA). "We want our teachers to become facilitators of learning, we want to encourage critical thinking and analysis skills. Once they are comfortable using technology, we're confident that we can bring about change."



Shared Vision

As principal of Canyon Ridge School (AZ), West wanted to empower everyone on the campus to make the school vision "a reality everyday in every classroom." From the founding of the math and science concept school in 2007, he fostered a sense of shared leadership. "When we come together to look at different situations and to solve problems, it is collaborative," he said. "Teachers see that and feel that this is their school, not the administrators' school. It is our school."

Implementation Planning

Through discussions with North Schuylkill principals and teachers, Paul Caputo determined that network and computer reliability were major obstacles to technology integration. The school board approved the use of capital reserve money for a major network upgrade. They restructured the network for higher bandwidth, higher quality access, added white-boards to classrooms, added more classroom access with thin clients, created two highly qualified IT staff positions for support, and focused professional development on web 2.0 skills using wikis, digital media, video, and iPods for instruction. "We introduced so many things this year," said Caputo, "we'll probably never have a year like this again."

Beimler of Chicago Public Schools (IL) believes that technology planning is essential to the school improvement process. He said: "If we are ever going to realize the vision of seamless technology, they have to be done together." His district used teacher technology skills assessment results to predict the level of acceptance and adoption with a new district information system. Even before launch, they knew how many teachers needed extra training to reach full adoption.

Skilled Personnel

For Principal Mary Cassidy, of Indialantic Elementary School (FL), time for teacher development is a significant challenge: "Everybody is at a different readiness level. It takes time to be proficient with it." To give teachers more time, she stopped having weekly staff meetings and switched to email for announcements, holding occasional meetings to share best practices and successes.

Technical Support

"It is necessary to have appropriate support both for staff training and for technical issues," said Cheryl Davis of Acalanes Union High School District (CA). "To integrate technology in a lesson, teachers take students to a shared computer lab. If they have a lesson planned and the technology doesn't work they will stop moving forward. Student access to technology from each classroom is the goal, but support for that kind of integration is expensive." Dysart School District sends an IT technician to the Canyon Ridge School 2-3 days a week for troubleshooting and hardware support. Within the school, a lead "e3" teacher provides support for teachers for technology integration. The district technology training specialist supports multiple schools with professional development and comes to school during prep times to help teachers. "Our district is wonderfully supportive in what they provide for teachers," said West of Canyon Ridge School (AZ). "They are available for us to call upon their expertise."

Supportive Policies

Chicago Public Schools (IL) provides every teacher with a computer in the classroom and has begun requiring teachers to use an electronic gradebook for reporting attendance. Even reluctant technology users have to log-in every day. Beimler's goal is to create a useful dashboard to engage all teachers to explore, whether it is personal—a pay stub and benefits—or professional –curriculum resources and student mastery data.

At Canyon Ridge School (AZ), students share computers to encourage collaboration rather than work individually in a one-to-one environment. "They need to be prepared for divergent thinking and to understand different perspectives," said Principal West. "We don't have desks; we have tables for collaboration and problem solving. If you were to walk into a classroom, you would see three students sharing a laptop, working together."

Engaging Communities

Paradise Valley has developed a systematic way to review new technologies and encourage innovation. A committee of community stakeholders reviews ideas that may come from teachers, students, parents, certificated and non-certificated staff. Accepted proposals go through alpha and beta phases before the committee considers district-wide adoption. According to Billings of Paradise Valley Unified SD (AZ), the committee is responsible for "guidance, approval, equity, and being responsible stewards of what the community has blessed us with... It's a dynamic committee that is evolving. If it doesn't help learning and/or teaching what are we doing?"

Evaluating Effectiveness

"As part of our strategic planning process for K-6, we identified skills we want students to attain based on NETS (National Education Technology Standards)," said Caputo of North Schuylkill SD (PA). "Computer teachers base their grades on how well students are achieving those competencies." They have begun defining assessments for secondary students as well and are considering a computer course requirement for graduation.

Chicago Public Schools (IL) uses the NETS (National Education Technology Standards) assessment for students and the NETS curriculum to address gaps in student skills. "Our constant battle is that we cannot interfere with the core content area," said Nicholson. "We cannot drive technology integration without closely aligning it with math, social studies, etc. When we provide technology tools, it has to be in alignment with curriculum offices."

Student Centered Learning

"I would like to see more project-based instruction," said Cheryl Davis of Acalanes Union High School District (CA). "I would like to see all kinds of technology in the hands of students. We should wrap new and mobile technologies into lessons so that students have access to a variety of tools during the school day to access the Internet, to research, and to create content."

"When you go into the classroom," said West of Canyon Ridge School (AZ), "you see kids engaged in science and math, using information and learning in multiple disciplines, collaborating with peers. That's very important to us." As part of the interdisciplinary curriculum, teachers pose a problem and students work on collaborative solutions. For example, in 2007-2008, eighth grade students tackled the challenge: What year will Surprise, Arizona, run out of water and what can be done to prevent it? According to West, student teams came up with different answers and different solutions. The open-ended, inquiry-based curriculum encouraged divergent thinking and respect for different points of view.

Multiple Measures for Calculating Success

Federal mandates and state standards require schools to track achievement of all students and show their progress in mathematics, reading, science and other core subjects. When asked which metrics proved most effective in measuring the impact of technology on student achievement, visionary administrators chose a variety of measures with a strong majority (64%) favoring 21st century skills measurements and achievement on state assessments a close second (see Figure 6). Visionary administrators who rated their tech proficiency as less developed than their peers were more likely to turn to improved student attendance (41%), improved teacher retention (28%), and parent feedback (38%) than their advanced peers.



Paul Caputo mines his district's technology data to measure program success. To measure parent communications, they track log-ins to a new electronic gradebook. "We had 144,000 unique log-ins throughout the year. We went from low attendance on parent nights to 250-300 parents logging in each night to find out about their child's progress," said Caputo of North Schuylkill SD (PA). "We view that as a step in the right direction."

The Paradise Valley technology committee uses several factors to determine whether or not successful pilots should be implemented district-wide, including sustainability, readiness (is the school ready, culturally), price, expected student achievement, compatibility, total cost of ownership, professional development and hardware requirements, as well as evaluating what has to be given up.

Brian Eyer of Digital Harbor High School (MD) sees attendance as an important measure of success, because if he does not engage his students in a meaningful way, they do not come to school. "Kids don't come to school because they have to take a test," he said. "They come because they want to learn something. They come to school because they really like technology. The teachers give them real world projects. They feel like they are a part of real world learning." The school's graduation and attendance rates are among the highest in the district.

Emerging Technology Adoption: Online Learning and Mobile Devices

At the turn of the century, schools measured technology penetration by network capacity and student to computer ratios. Now they must show how technology expands learning opportunities or can be seamlessly incorporated into instruction. Each year, administrators evaluate new technologies to determine if it should be integrated into instruction, accessed by students at school or excluded from campus. In some ways, districts remain in a constant process of technology adoption and integration. Diffusion of innovations theory (Rogers, 1995) identifies a predictable Bell-shaped rate of adoption of new technologies in a given community: innovators (2.5%), early adopters (13.5%), early majority (34%), late majority (34%) and laggards (16%). To gauge the level of adoption, Speak Up asked all participants their opinions about two emerging technologies: online learning and mobile devices.

Online Learning

Nine out of ten district visionary administrators and three out of five school visionary administrators reported some form of online learning for students. However, just 10% of students say they have taken an online course. Despite their lack of experience with online learning, one in three high school students, one in four middle school students, and one in five elementary students listed online learning as a key component of a 21st century school. With strong student interest in online learning and some form of online learning available in so many districts, actual student access seems limited and requires further investigation.

Over half of all visionary administrators say that they would provide or expand online courses to keep students engaged in school.

Over half of all visionary administrators say that they would provide or expand online courses to keep students engaged in school. Other reasons include to expand curriculum offerings (49%) to offer schedulin

reasons include to expand curriculum offerings (49%), to offer scheduling alternatives (46%), for remediation (45%), for more personalized instruction (41%), and if teachers were interested in teaching online classes (40%), see Figure 7.

Visionary administrators report that they have implemented online learning in different subject areas without a strong trend in any single direction. Courses offered included: core curriculum (20%), remedial support (14%), technology courses (12%), and enrichment courses (12%). When asked about significant factors for expanding or providing online courses, visionary administrators are more likely to address class scheduling problems through online AP courses (71%), expand curriculum offerings through online career technical education courses (69%), and engage students in school through enrichment courses (68%).

Online learning takes many forms from a fully online course taken anywhere to a hybrid or blended approach where online learning





enhances a traditional course. Advanced/honors and foreign language courses were most frequently implemented as instructor-led, online courses that students take while on campus (49%) with advanced/honors courses also available for students to take anywhere (40%). Self-paced, student-directed online learning was the preferred method of delivery for core curriculum (44%) and enrichment courses (43%). Career technical education is most likely implemented as a blended online course with face-to-face interaction with teachers.

Digital Harbor High School (MD) specializes in technical career education for all students using online curricula with trained teachers in traditional classrooms. In ninth grade, students select a career pathway and work toward professional certification in computer programming, networking, support systems, or media. The technology courses combine hands-on lab work with online training, and proctored exams. In addition to career courses, students have a full load of traditional high school courses that take advantage of a blended online learning environment. Digital Harbor instructors use Blackboard to post assignments and class information for 24/7 access by students and parents.

Mobile Devices

Speak Up also looked at mobile devices, a technology that is in the early adopter phase for schools, but has reached late majority adoption rates among students. Student access to mobile devices has exploded in the past year, especially for MP3 players and smart phones. The number of middle and high school students with smart phones increased by over 44% from 2006 to 2007 with one in four high school students now carrying a "computer in their pocket."

Administrators recognize that they have to address the mobile device issue. Visionary administrators are optimistic about the learning potential: 76% believe that mobile devices increase student engagement. They also believe that mobile devices have the potential to extend learning beyond the school day, prepare students for the work world, and help

They also believe that mobile devices have the potential to extend learning beyond the school day, prepare students for the work world, and help students develop 21st century skills such as critical thinking and collaboration. students develop 21st century skills such as critical thinking and collaboration. Through interviews, visionary administrators acknowledge the growing importance of mobile devices, but remained uncertain about how to effectively integrate these new devices into instruction.

"We see a lot more cell phone use coming," said Billings of Paradise Valley Unified SD (AZ). "We're not sure how to take advantage of it." He mentioned one high school AP course that experimented by using mobile phones as a response system where students voted online. Canyon Ridge School (AZ) definitely sees mobile phones in the future. "There is a role that needs to be explored," said West. "How do you make that a reality and maintain a focus? Students can be accessing information, creating multimedia, going outside to the playground and using GPS features."

When students use personal mobile devices for school work, equitable access concerned 37% of visionary administrators. "We've had discussions, but we're not ready yet," said Caputo of North Schuylkill SD (PA). "We had a teacher experiment with texting homework assignments to students." However, concerns about fees students might incur sending and receiving text prevented widespread deployment.

Students are much more pragmatic about why they want access to mobile devices. Half of middle and high school students want to use mobile devices to work on school projects and to communicate with classmates. They are interested in productivity—using organization tools, sharing calendars and accessing school portals.

Like any technology, the primary challenges to integrating emerging technologies such as mobile learning devices and online learning were funding, professional development, integration into the curriculum and providing access to all students. One in four visionary administrators also mentioned competing priorities as a challenge.

Visionary administrators and the Schools of the Future

The 21st century classroom, according to visionary administrators and students is a student-centered, technology-rich environment with laptops, multi-media equipment, interactive whiteboards, online databases, communication tools, learning management systems, student email or IM access, games and virtual simulations, and unlimited student access to the Internet. Although the challenges to integration persist, visionary administrators understand the role of technology in preparing students for the 21st century workplace and global citizenship, and seek out solutions that will best engage students and help them become lifelong learners. They do not measure success by faster networks and more computers, instead they apply a range of measures to track how technology is used to increase achievement and student engagement.

Technology management has evolved from a district business service to a core instructional service where technology administrators work closely with curriculum and instruction staff to analyze needs and plan strategically. Visionary administrators at all administrative levels do not just talk about technology, they use it in their professional and personal lives. And that experience translates into a cultural shift in their schools. Effective visionary administrators nurture "grassroots" efforts to integrate technology into instruction by supporting teacher exploration of new tools and by encouraging students to take a leadership role in using technology. They help teachers become comfortable with technology and to accept their role as facilitators of learning. Visionary administrators regularly visit classrooms to observe real changes in pedagogy where technology has become integrated into instruction.

Kevin West of Canyon Ridge School (AZ) spoke of creating a 21st century school that supports "divergent thinking" among students. With a student-centered classroom, open-ended problems, and resources for collaboration, Canyon Ridge School invites digital natives to learn and explore in ways they are accustomed to. Divergent thinking might also be used to describe how visionary administrators approach transforming curriculum and instruction with technology. Each visionary administrator interviewed started from the same place: how do we help our students prepare for work and life in the 21st

century. They leveraged local resources, local talent, different funding strategies, and a range of technology solutions to offer their students a richer, more differentiated, and more relevant learning environment.

"Teachers are starting to make it real with the students," said Jeff Billings of Paradise Valley Unified SD (AZ), "and the students are making it real with the teachers. Now we have to keep it running." Technology management has evolved from a district business service to a core instructional service where technology administrators work closely with curriculum and instruction staff to analyze needs and plan strategically.



BRIDGING THE HOME SCHOOL DIVIDE



Visionary administrator: Cheryl Davis, district curriculum & instruction technology specialist, Acalanes Union High School District and technology coordinator at Miramonte High School, Orinda, CA (www.acalanes.k12.ca.us/miramonte)

Students: 1,391
Teachers/staff: 100
Community: A suburban, family-oriented community east of San Francisco in
Contra Costa County.
Ethnicity: 71% White, 15% Asian, 9% Multiple/No Response, 4% Hispanic/Latino, other
Free and reduced lunch: none

Even with limited resources, teachers are innovating and extending learning beyond the school walls. Miramonte High School, Orinda, CA, is one of four high schools in the Acalanes Union High School District, located in an affluent community east of San Francisco. The district and schools depend on school foundations and parents to raise extra funds for technology. Cheryl Davis, district curriculum and instruction technology specialist, splits her time between the district and Miramonte High

School, providing staff development for technology integration. She is an Apple Distinguished Educator and *Google* Certified Teacher who is active in online communities interested in technology innovation.

The district is doing all the right things to support technology integration: educating administrators, creating a strategic plan with a technology component, reaching out to parents and the community. "We are plotting out how to implement it. What stops us is the funding component. With the reduction of education funding in the current California budget proposal, we had to cut our technology budget to keep other classroom programs going. We don't qualify for most grants."

Despite supportive school board members and parents who value technology, the money is just not available for a one-to-one environment. Teachers still take students to a computer lab for access and Davis believes that "until we are a one-to-one district, classroom instruction won't change much." Even with limited resources, teachers are innovating and extending learning beyond the school walls. Teachers use Blackboard to post course information and extend classroom discussions. The art teacher posts podcasts online for critiques. A Latin teacher posts interactive Latin quizzes to help students practice for Latin National Exams.

Because students do not have a high level of access at school, they have begun to use the *Google Docs™* program for collaboration from home. AP students use the collaborative software for peer editing and critiques, while social studies students write collaborative reports. For parent meetings, teachers post an agenda through the *Google Docs™* program for review.

"I would like to see more project-based instruction," said Davis. "I would like to see all kinds of technology in the hands of students. We should wrap new and mobile technologies into lessons so that students have access to a variety of tools during the school day to access the Internet, to research, and to create content."

PREPARING FOR COLLEGE AND CAREERS



Visionary administrator: Brian Eyer, principal Digital Harbor High School, Baltimore, MD (http://digital.baltimorecityschools.org/)

Students: 850

Teachers/staff: 87

Community: downtown Baltimore, serving students from throughout the city **Ethnicity:** 71% Black, 24% White, 3% Hispanic, 2% Asian/Pacific Islander, other Free and reduced lunch: 70%

"They feel like they are a part of real world learning."

Digital Harbor High School offers students a safe environment for learning that is rich with technology and career preparation. Founded in 2002, within a school suffering from low graduation rates and disorder, Digital Harbor's mission is to make sure all kids are career and college ready by using cutting edge technology. Each student chooses a pathway and works toward professional certification and a high school

diploma. The career path draws students to the school and keeps them engaged while offering a rigorous, relevant core curriculum in addition to the technology training. The school receives about 2,000 applicants each year for the 850 spots available.

In 9th grade, Digital Harbor High School students choose from Oracle computer programming, the Cisco Networking Academy, MOUSE for computer support, or Adobe Premier media training. Each vocational training program has certified instructors with scheduled class time as well as online coursework and hands-on access to professional level technology.

"Kids don't come to school because they have to take a test," said Principal Brian Eyer. "They come because they want to learn something. They come to school because they really like the technology. The teachers give them real world projects. They feel like they are a part of real world learning."

Eyer knows that the approach is working because Digital Harbor has achieved one of the highest attendance rates for open enrollment schools in the district. In 2006, the first Digital Harbor class graduated and all of the students received acceptance for post secondary education.

Funding stands out at the top of Eyer's list of challenges. The success of technology integration makes maintenance, repair, and upgrades essential to school operations. All teachers integrate technology into their daily lesson plans, not just the career pathways instructors. A business advisory board helps raise funds and advises the school on technology education needs for careers.

To enhance the students' experience and better prepare them for the working world, the school is developing an internship program with local businesses. Plans for an online store and a computer repair shop are other ways the school connects with the community.

OPPORTUNITY FOR ALL TO CONNECT TO THE WORLD



Visionary administrator: Paul Caputo, supervisor of curriculum, technology and federal programs North Schuylkill School District, PA (www.northschuylkill.net) Number of schools: 2 Students: 2,100 Teachers/staff: 150 Community: rural area, serving several small towns Ethnicity: 98% white, not Hispanic Free and reduced lunch: 33%

Preparing students for 21st century jobs means "providing them with the communication skills they'll need to be successful and math and reading skills to compete globally." A rural school district located in northeast PA, North Schuylkill School District educates about 2,100 students. For Paul Caputo, supervisor of curriculum, technology and federal programs, technology provides a unique opportunity to expand the horizons of North Schuylkill students. The district created his position to foster technology integration within the K-12 curriculum. His primary concern is making sure that students have the same opportunities as their peers in larger, more affluent districts.

"Technology levels the playing field," he said. "Whether they enter the workforce or go into higher education, they need 21st century skills. They need the latest technology: whiteboards, laptops, mobile devices..."

In 2007-2008, the district launched a major technology initiative. Through discussions with principals and teachers, Caputo determined that network and computer reliability had become major obstacles to technology integration. The school board approved a major network upgrade, two highly qualified IT staff positions, and a transition to low-maintenance thin clients with hosted software for online class information and remote access. The district achieved 99.9% uptime in the first year of deployment, and experienced significant increase in parent involvement with an online gradebook. "We went from low attendance on parent nights to 250-300 parents logging in each night to find out about their child's progress," said Caputo.

Caputo believes strongly in allowing teachers opportunity for learning and innovation. If teachers want to try it, Caputo and his staff help them: "We want to bring about a shift in pedagogy by encouraging our teachers to become facilitators of learning. This shift will ultimately lead to the further development of each student's critical thinking and analysis skills." In 2007, North Schuylkill received a *"Classrooms for the Future"* grant from the Pennsylvania Department of Education to provide professional development for 33 teachers on teaching in the 21st century and Authentic Teaching. Other workshops focus on web 2.0 skills: using wikis, digital media, video and iPods in the classroom.

To Caputo, preparing students for 21st century jobs means "providing them with the communication skills they'll need to be successful and math and reading skills to compete globally. We need to make sure that our curriculum is rich enough and diverse enough to attend to different learning styles. Programs such as art and technical education must be as strong and vibrant as our core courses."

Caputo holds the fundamental belief that "technology is important and students learn differently." As a visionary administrator, his role is to encourage students and staff not to be afraid to make mistakes. Teachers are also encouraged to empower students and allow them to become partners in the use of classroom technology. He said: "While teachers are the content experts, they can learn from students new ways to use these tools."

A DYNAMIC APPROACH TO TECHNOLOGY INTEGRATION



Visionary administrator: Jeff Billings, district technology coordinator Paradise Valley Unified School District, AZ (http://cmweb.pvschools.net/siteweb) Number of schools: 44 Students: 34,000 Teachers/staff: 4,800 Community: northeast metropolitan Phoenix and north Scottsdale, Arizona Ethnicity: 71% White, 21% Hispanic, 3% Black, 3% Asian, 2% others Free and reduced lunch: 27%

"We have to get out of our thinking that learning only happens in my classroom." The fourth largest school district in AZ, Paradise Valley Unified School District serves the growing community of northeast metropolitan Phoenix and north Scottsdale. The district provides wired and wireless access throughout every campus over a converged voice, data, and video network with a 2.5 to one student to computer ratio. A Learning Management System (LMS) supports online courses for high school students, and the district was one of the first contributors to Apple's iTunes[®] University.

The district encourages innovation with a clear process for advocating and adopting technology. A committee of stakeholders reviews ideas that may come from teachers, students, parents, certificated and non-certificated staff. Accepted proposals go through alpha and beta phases before the committee considers district-wide adoption. For example, when the district noticed high use of collaborative web tools by teachers, they created a pilot using the *Google Docs*[™] program. The project has grown to 14,000 accounts through volunteer teacher interest, principal involvement and parent sign off. The *Google* domain approach has been adopted for all secondary and middle schools.

When Jeff Billings became the district technology director in 2000, he had a team of nine people to support computers and printers throughout the district. He has watched school technology evolve from a business service to a core instructional service. He is constantly thinking about the future: "Where does technology need to be in five years and how will we get there? What do teachers and students need in the classroom and what is the classroom? Hybrid, converged, virtual..."

Billings describes a learning environment where few boundaries exist. Technology is transparent and ubiquitous. Students connect to experts in the field or work with peers anywhere in the world. "We have to get out of our thinking that learning only happens in my classroom." High School students use synchronous chat, audio visual chat, and the *Google Translate™* translation service tools to connect with a partner school in Beijing. Another participatory learning program links astronomy students with astronomers. During the 2008-2009 school year, REACH, Real Experiences Advancing Childhood Humanities, encourages every student in every classroom with every teacher to "reach" beyond their four walls. Many will use chat, broadcasting, and *Google* accounts to facilitate this.

Students have easy access to digital "snippets" to explain concepts created by district teachers and available through iTunes[®] University. If they do not understand a concept explained by their classroom teacher, they can try another explanation online. Teachers can "author once, publish to many."

"More and more is being driven through the net and there is more multimedia," said Billings. "A picture is worth 1000 words, and a movie is worth 10,000. There is going to be a lot of cultural change and I think it will be for the better. Human kind will figure it out and make it better."

PROFESSIONAL LEARNING FOCUS



Gerald Beimler



Nick Nicholson

Visionary administrators: Gerald Beimler, director of impact and user support and Irving (Nick) Nicholson, director of eLearning programs Chicago Public Schools, IL (http://cps.k12.il.us) Number of schools: 655 Students: 408,601 Teachers/staff: 44,417 Community: urban school district Ethnicity: 46.5% African-American, 39.1% Latino, 8.0% White, and others Free and reduced lunch: 84.9%

Chicago Public Schools is the third-largest school system in the United States with more than 655 schools, 408,601 students, and 44,417 staff members in 2007-2008. Irving Nicholson, director of eLearning programs, oversees grant funds to promote technology integration through professional development, and provides resources for coaching and mentoring. As director of impact and user support, Gerald Beimler manages the information technology component of professional development, and prepares teachers and administrators to use data analysis appropriately and effectively.

A common benchmark assessment taken by students twice yearly has generated a rich pool of data for analysis to inform instruction. The benchmark data and subsequent data analysis are combined with instructional resources in a curriculum instruction management

system (CIM). When teachers learn how to use these resources appropriately they can change how they teach. "We limit the amount of technology training that we give initially," said Beimler with regard to access to the data analysis. "We want to make sure you get there and make sure you know what to do when you get there."

"When you go into a classroom, you pick up a piece of chalk. Technology is as automatic as picking up the chalk." One method for streamlining technology integration by district personnel is to encourage daily usage so that powering up and logging in become routine. For example, the curriculum instruction management system includes an online attendance module that every teacher must use, every day. In addition, Beimler oversees the development of dashboards tailored for each district employee: a principal view shows attendance reports while a teacher view displays the latest student mastery measures. Users also have access to grade books, resources, and drill down reports as well as salary and benefits information, all from a single log-in.

All teachers have at least one computer in their classroom; however, it takes time to help reluctant teachers transition to technology. "You can't just put tools and laptops in their hands and expect things to happen," said Nicholson. "The district took a lot for granted and put laptops out. A lot of those never made it out of the boxes or integrated into curriculum. We've taken a step back to assess and help them know what they don't know." The district offers teachers a short list of professional development options based on the NETS-based skills assessment. Professional development concerns keep Nicholson awake at night: "Are we taking the right approach? Are we meeting the needs of our clients? Are we making an impact? Are they retaining it? Are they using it? Or are they just taking it to move up the ladder?"

"We want technology to be almost a thoughtless, seamless process," said Nicholson. "When you go into a classroom, you pick up a piece of chalk. Technology is as automatic as picking up the chalk. The newer teachers are expecting it and our students are expecting it when they come into the classroom."

REAL-WORLD PROBLEM SOLVING WITH MATH AND SCIENCE



Visionary administrator: Kevin West, principal Canyon Ridge School, Surprise, AZ (http://www.dysart.org/canyonridge)

Students: 850 Teachers/staff: 40

Community: serving students from the cities of Surprise and El Mirage **Ethnicity:** 72% White, 14% Hispanic, 8% Black, 5% Asian, 1% Indian Free and reduced lunch: 21%

"We start off asking what learning outcomes do we have in mind? What do we want students to accomplish, to know, to do? Then ask how can technology enhance and accelerate it?" Founded in 2007 by Dysart School District, Canyon Ridge K-8 School is a math and science concept school designed to explore different instructional strategies and model them for other schools and districts. Students gather and apply knowledge from multiple disciplines with particular emphasis on science, math and health supported by transforming uses of technology. Hallmarks of this school include project-based learning, flexibility in student grouping and use of time, research and assessment to drive instructional decisions, and innovative approaches to teaching and learning.

Technology is essential to learning at the school, but they do not teach technology. According to West: "We start off asking what learning outcomes do we have in mind? What do we want students to accomplish, to know, to do? Then ask how can technology enhance and accelerate it?"

As part of the curriculum, teachers pose a problem and students work on collaborative solutions across the curriculum for the entire year. During the 2007-2008 school year, eighth grade students struggled with the challenge: What year will Surprise, Arizona, run out of water and what can be done to prevent it? "Answers may look really different, but that allows for divergent thought," West said.

Every classroom features mounted projectors, six laptops, digital response systems, document viewers, and mini smart boards. An IT technician spends two to three days a week on campus troubleshooting hardware for teachers and each school has an "e3" lead teacher who provides support to teachers for technology integration. A district technology training specialist supports multiple schools with professional development on site.

One first grade teacher had students record themselves as they learned to read. Over time, students can compare the readings and understand their progress. "That's powerful for students to self analyze their own reading and develop their fluency," said West. Students can even email the recording to Mom or Dad at work. "And that's powerful for parents."

"We're focused on thinking skills that kids need to develop," said West. "We want them to be creative, innovative, problem solvers. We want them to be collaborative. We're not just teaching the standards, we teach for deep understanding so they can take this content and make connections across disciplines. We promote leadership and personal responsibility skills."

CHANGE LEADERSHIP AND TECHNOLOGY INTEGRATION



Mary Cassidy



Debbie Fry

Visionary administrator: Mary Cassidy, principal, and Debbie Fry, network/technology services associate Indialantic Elementary School, Indialantic, FL (http://indialantic.es.brevard.k12.fl.us)

Students: 779
Teachers/staff: 40
Community: A beach community school located on the space coast where the Space Shuttle launches
Ethnicity: 87% white, 5% black, 3% Hispanic, 3% multiracial, other
Free and reduced lunch: 13%

Indialantic Elementary is a State of Florida "A" school located on the barrier island off the eastern coast of Florida. Principal Mary Cassidy qualifies as a visionary administrator even though she considers her tech skills average. "My view on technology is to surround myself with very competent people and avail myself of them as resources," she said. "In these days of fiscal issues, we may not be able to buy as many gadgets, but we will have quality in what we do and use it well." She relies on Debbie Fry, the school network/technology services associate who teachers voted employee of the year in 2007-2008.

"One part of my job, which has the most impact, is helping teachers feel comfortable to involve students," said Fry. In 2007-2008, the district provided a major upgrade to the school network and technology. Each classroom now has a teacher laptop and three

student computers, an LCD projector, a DVD CD player, audio amplifier, multimedia databases to use with their lessons, and an integrated document camera. "Our teachers have a very good foundation in educational technology. They have all these new gadgets and toys, we need to train them to feel more comfortable and more creative using them."

We're always reflecting on what we do here and how we can do it better." At the same time, finding time for teacher development is a significant challenge. "Everybody is at a different readiness level. It takes time to be proficient with it," said Cassidy. To give teachers more time, she stopped having weekly staff meetings and switched to email for announcements, holding occasional meetings to share best practices and success.

Indialantic is a Glasser Quality School, based on the improvement principles defined by Dr. William Glasser. "We try to have meaningful relationships with each other and with our students," said Cassidy. "If my people aren't improv-

ing, then my students aren't improving. We're always reflecting on what we do here and how we can do it better." In terms of technology integration, that means Cassidy and her staff use technology where it affects student achievement not to develop isolated skills.

For example, Fry observed a group of 5th graders conducting a science experiment and using a broad spectrum of technology skills. "They recorded themselves performing the experiment then edited data tables, and reported results and conclusions," said Fry. She has noticed a shift to a more student-centered approach to instruction. "One thing I noticed this year, I'll walk into a classroom to fix a piece of hardware and it's not a teacher in front of the room."

"They are a lot more focused," said Cassidy. "By having students actively involved, they're internalizing a process and becoming responsible for their learning."

Resources

International Society for Technology in Education (ISTE). (2002). *Essential Conditions for Implementing NETS for Administrators*. Retrieved July 28, 2008, from ISTE Web site: http://www.iste.org/Content/NavigationMenu/NETS/ForAdministrators/2002Standards/Conditions/NETS-A_2002_Essential_Conditions.pdf.

International Society for Technology in Education (ISTE). (2008). *Refreshing ISTE'S National Educational Technology Standards for Teachers (NETS – T)*. Retrieved July 28, 2008 from ISTE Website http://www.iste.org/Content/Navigation-Menu/NETS/NETS_Refresh_Forum/NETS_Toolkit_Presentation2-08.ppt

International Society for Technology in Education (ISTE). (2007). *NETS for Students 2007*. Retrieved 2008, from ISTE Web site: http://www.iste.org/Content/NavigationMenu/NETS/ForStudents/2007Standards/NETS_for_Students_2007.htm.

Moersch, C. (1994). *Original LoTi Framework*. Retrieved 2008, from LoTi Web site: http://www.loticonnection.com/lotilevels.html.

Partnership for 21st Century Skills. (2004). *Framework for 21st Century Learning*. Retrieved 2008, from Partnership for 21st Century Skills Web site: http://www.21stcenturyskills.org/index.php?option=com_content&task=view&id=254<e mid=12.

Prensky, M. (2001a October). *Digital Natives, Digital Immigrants.* Retrieved 2008, from Marc Prensky Web site: http://www.marcprensky.com/writing/Prensky%20-%20Digital%20Natives,%20Digital%20Immigrants%20-%20Part1.pdf.

Prensky, M. (2001b December). *Digital Natives, Digital Immigrants, Part II: Do They Really Think Differently?* Retrieved 2008, from Marc Prensky Web site: http://www.marcprensky.com/writing/Prensky%20-%20Digital%20Natives,%20 Digital%20Immigrants%20-%20Part2.pdf.

Prensky, M. (2005). *Adopt and Adapt: Shaping Tech for the Classroom.* Retrieved 2008, from Edutopia Web site: http://www.edutopia.org/adopt-and-adapt.

Prensky, M. (2008 March). *Turning On the Lights: Educational Leadership.* Retrieved 2008, from Association for Supervision and Curriculum Development (ASCD) Web site: http://www.ascd.org.

Project Tomorrow. (2008). 21st Century Students Deserve a 21st Century Education. Retrieved July 28, 2008, from Project Tomorrow Web site: http://www.tomorrow.org/docs/National%20Findings%20Speak%20Up%202007.pdf

Redish, T. (n.d.). *An Evaluation of the InTech Project in Georgia*. Retrieved 2008, Web site: http://gaetc-ejournal.org/prodev/intech/intech.htm.

Rogers, E.M. (1995). Diffusion of innovations (4th ed.). New York: The Free Press.

Endnotes:

Google is a trademark of Google Inc.

iTunes is a trademark of Apple Inc.

Blackboard is a trademark of Blackboard Inc.

About Project Tomorrow

Speak Up is a national initiative of Project Tomorrow (formerly known as NetDay), 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 of the world. Since fall 2003, the annual Speak Up project has collected and reported on the views of over 1.2 million K-12 students, teachers, administrators and parents representing over 14,000 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 instruction. Education, business and policy leaders report using the data regularly to inform federal, state and local education programs. For additional information, visit **www.tomorrow.org**.

About Blackboard

Blackboard offers K-12 schools and districts a central online hub of teaching, learning and community development to enhance academic performance and deliver a powered learning experience. Each day over 12 million learners around the world impact education and make new connections with the support of Blackboard solutions. Highly scalable, easy-to-use, and focused on student engagement and achievement, Blackboard's Learning Management Platform is used by K-12 districts nationwide to prepare students for the 21st Century.

About Karen Greenwood Henke

Karen Greenwood Henke is a writer, consultant, and speaker specializing in technology and K-12 education. Wellknown for her expertise in technology trends in education, Mrs. Henke regularly speaks at educational technology conferences and has written over fifty articles and white papers on emerging technologies in K-12 education, datadriven decision making, thin client technology, and enterprise IT security. She publishes Grant Wrangler, a grant listing service for teachers and schools, and blogs about the future of education at **www.longtaillearners.com**. Henke is on the Consortium of School Networking (CoSN) Board of Directors.

To download the original report, Leadership in the 21st Century: The New Visionary Administrator,

please visit www.blackboard.com/k12/education21c



Project Tomorrow 15707 Rockfield Blvd, Suite 330 Irvine, CA 92618 949 609-4660 www.tomorrow.org



Blackboard Inc. 650 Massachusetts Avenue N.W. 6th Floor Washington DC 20001 www.blackboard.com/k12