

# Mobile Students, Mobile Learning

A Luidia White Paper

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*Learn about top technology trends in education, how mobile devices enhance the educational process and how emerging mobile technologies exhibit great potential to make teaching and learning more engaging.*

**“Our nation’s students are in fact a ‘Digital Advance Team’ illuminating the path for how to leverage emerging technologies effectively for teaching and learning.”**

Today’s students are technology naturals. They are the first generation to have grown up with digital media and they easily adopt new technologies—computers, mobile devices, and Web 2.0 tools like wikis, blogs and social networking sites like Facebook and Twitter. They are adept at multi-tasking, from texting friends and downloading music, to watching YouTube videos on their phones. If you compare your iPhone with that of a twelve year-old, you’re likely to discover that they have much cooler applications than you and that their (often global) network of contacts, “friends,” and “fans” far exceeds yours.

Don Tapscott calls these students the “Net Generation” in his book *Grown Up Digital* and he’s relentlessly positive and hopeful about this group of eleven to thirty year-olds. In his \$4 million research study he surveyed more than 11,000 young people and discovered not “a bunch of spoiled screenagers with short attention spans and zero social skills,” but “a remarkably bright community which has developed revolutionary new ways of thinking, interacting, working and socializing.”

Tapscott describes eight characteristics of a “Net Gener” that differentiates them from their parents:

- They prize freedom and freedom of choice.
- They want to customize things, make them their own.
- They’re natural collaborators who enjoy a conversation, not a lecture.
- They’ll scrutinize you and your organization.

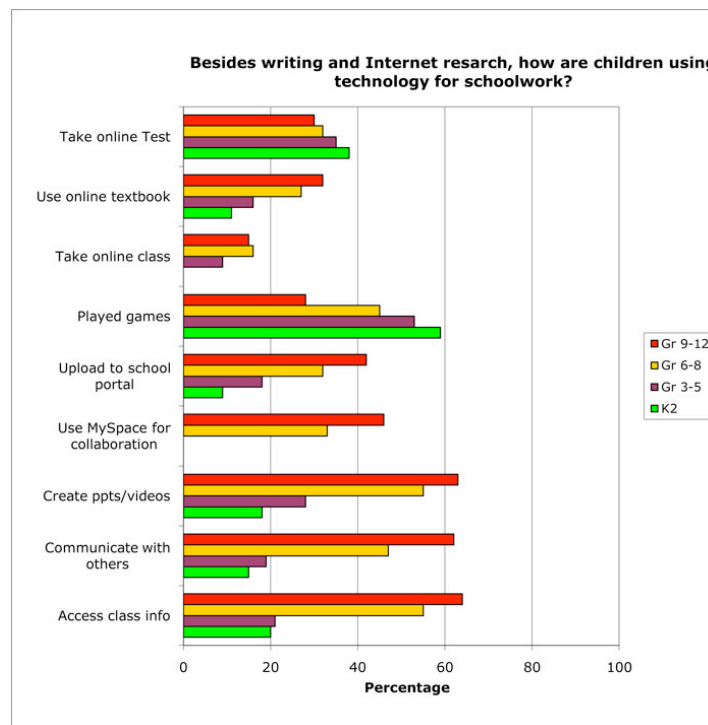
National Research Project, Project Tomorrow

- They insist on integrity.
- They want to have fun, even at work and at school.
- Speed is normal.
- Innovation is part of life.

These young people can teach us so much about our future. Tapscott believes that the digital tools students use today are “more powerful than what exists in much of corporate America,” and if we listen to them, “their culture of interaction, collaboration and enablement will drive economic development and prepare this shrinking planet for a more secure, fair and prosperous future.”

Why do today’s students value a “connected lifestyle” so much? Does the must-have-information-now mentality parallel an overall change in the ability to persevere or focus on other projects – like school work? What opportunities do these new realities offer to creative educators who have knowledge of and access to, tools that tap into student interests?

In this paper we explore answers to these questions, focusing on how new technologies, especially mobile tools, are already changing the educational landscape and have great potential to make teaching and learning more engaging. As we will demonstrate, technology this generation uses everyday is already helping them to communicate, collaborate, create content and think critically and creatively, all critical skills for the 21<sup>st</sup> century. Digital tools can also provide new ways to learn core subject areas and support differentiated instruction to meet all students’ needs. Technology is an integral part of life for this generation and it can be a powerful force inside and outside the classroom.



# Top Technology Trends in Education

It's essential for educators to stay open to technologies that can move teaching and learning into the kinds of experiences that meet the needs of today's students. It can be a challenge, but today's teacher can stay abreast of changing technology through media and reports that focus on educational technology. Below is a recent list of the top technology tools and trends as reported in THE Journal, which summarizes the "latest and greatest" hardware and software solutions that educators should be watching.

## 1. eBooks Will Continue to Proliferate

eBook readers aren't going to replace traditional math and English textbooks very soon, but the devices will begin to make their way into K-12 classrooms. When these readers start to integrate color graphics and animation, they'll become more viable for the textbook market.

## 2. Netbook Functionality and Adoption Will Grow

One-to-one computer initiatives are proliferating throughout United States schools and are expected to become more popular as netbooks become even more affordable. Currently priced at \$200 to \$400, these small, inexpensive computers are helping to bridge the technology divide that exists at those schools where individual students don't have access to their own laptops.

## 3. More Teachers Will Use Interactive Whiteboards

Interactive display systems that allow teachers and students to work together in ways that traditional blackboards cannot are gaining ground in the K-12 environment. Sheryl Abshire, chief technology officer for Calcasieu Parish Public Schools in Lake Charles, LA, predicts that their use will continue to increase. "The buzzword for the 21<sup>st</sup> century is 'engaged learning,' and the whiteboards will serve as a catalyst for getting students out of their seats and up to the board to learn."

## 4. Personal Devices Will Infiltrate the Classroom

Smartphones and iPods are now making their way into K-12 classrooms. Most smartphones come with wireless Internet capabilities and larger screens make them more relevant for K-12 learners. It's now culturally acceptable for someone as young as seven or eight years old to have a cell phone, so it won't be long before even more students have access to more wireless, portable devices at school.

## 5. Technology Will Enable Tailored Curricula

High on many educators' and administrators' wish lists right now is an easier, tech-based way to assess, record and track individual student performance in the classroom. Several emerging companies are working on new tools for student assessment, including programs that allow teachers to track a child's progression through the K-12 years on a weekly basis. The programs will also integrate benchmarking data for measuring a student's progress against other children, paving the way for more

individualized, customized curriculum options.

Although some of this technology is still in the beginning stages, much of it is already moving into wide use. Interactive whiteboards, for example, are rapidly making their way into the classroom, helping to create the type of environment for the interactive and individualized learning on which this generation thrives.

“Now is the time to turn the new media that children have a natural attraction to into learning tools that will build their knowledge and broaden their perspectives.”

*Pockets of Potential: Using Mobile Technologies to Promote Children's Learning*

## Goals of Mobile Learning

In *Pockets of Potential: Using Mobile Technologies to Promote Children's Learning*, writer Carly Shuler suggests that “now is the time to turn the new media that children have a natural attraction to into learning tools that will build their knowledge and broaden their perspectives. Unless we do, the gulf between what children do informally and in school will widen, diminishing the educational opportunities all of our children need and deserve.”

Shuler's report, sponsored by the Joan Ganz Cooney Center at Sesame Workshop, draws on interviews with a cross-section of research, policy and industry experts “to illustrate how mobile technologies such as cell phones, iPods and portable gaming platforms might be more widely used for learning.” Shuler points out that more than half of the world's population now owns a cell phone, while children under 12 are one of the fastest-growing segments of mobile technology users in the U.S. Included in the report are descriptions of more than 25 handheld learning products and research projects in the U.S. and abroad that show how mobile devices can re-define teaching and learning.

How should mobile devices be used to support learning? Shuler believes they have significant potential to support learning experiences. For example, ninth-grade algebra students at four high schools are using smartphones to access digital simulations and to work with digital manipulatives to learn about abstract concepts. A GeoHistorian project uses wireless mobile technologies to link classrooms with local historical landmarks. Elsewhere, mobile phones are used to take photos and videos and to capture audio clips that are combined into short movies and uploaded to the Internet.

Innovative examples of mobile learning are appearing from around the world. Shuler lists five opportunities that “seize mobile learning's unique attributes to improve education”:

### 1. Encourage “anywhere, anytime” learning

Mobile devices allow students to gather, access and process information outside the classroom. They can encourage learning in a real-world context and help bridge school, after-school and home environments.

### 2. Reach underserved children

Because of their relatively low cost and accessibility to low-income communities, handheld devices can help advance digital equity, reaching and inspiring populations “at the edges” — children from economically disadvantaged communities and those from developing countries.

### 3. Improve 21<sup>st</sup>-century social interactions

Mobile technologies have the power to promote and foster collaboration

and communication, which are deemed essential for 21<sup>st</sup>-century success.

#### 4. Fit with learning environments

Mobile devices can help overcome many of the challenges associated with larger technologies, as they fit more naturally within various learning environments.

#### 5. Enable a personalized learning experience

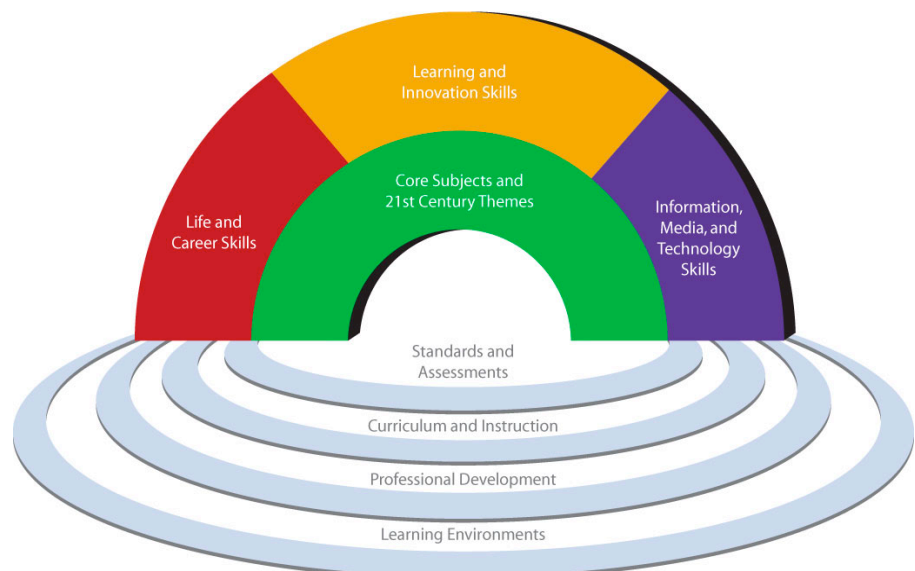
Not all children are alike; instruction should be adaptable to individuals and to the needs of diverse learners. Mobile devices offer significant opportunities for genuinely supporting differentiated, autonomous and individualized learning.

These five opportunities show the potential of mobile devices to promote the knowledge, skills and perspectives children will need to compete and cooperate in the 21<sup>st</sup> century.

## Skills for the 21<sup>st</sup> Century

The Partnership for 21<sup>st</sup> Century Skills is a national organization that advocates for the integration of skills such as critical thinking, problem solving and communication into the teaching of core academic subjects. It has developed a vision for student success in the new global economy, known as the Framework for 21<sup>st</sup> Century Learning. The Framework describes the skills, knowledge and expertise students must master to succeed in work and life and to be effective citizens and workers of the 21<sup>st</sup> century.

21st Century Student Outcomes and Support Systems



©The Partnership for 21st-Century Skills ([www.21stcenturyskills.org](http://www.21stcenturyskills.org))

The Partnership actually views all components as fully interconnected in the process of 21<sup>st</sup> century teaching and learning.

Mobile technologies fall under the general skill category of “Information, Media and Technology Skills.” The Framework suggests that the ability to use technology tools to access, manage, evaluate and create information will be essential to the successful functioning of our knowledge economy. Among the essential digital technologies listed are computers, handheld devices, media players, GPS systems, communication/networking tools and social networks. So clearly, mobile tools play an important role in developing the skills needed to live in a technology and media-driven world.

“Perhaps the most ubiquitous technology in children’s lives today are mobile devices—tools such as cell phones, iPods and portable gaming platforms that traverse home, school and play via the hands and pockets of children worldwide.”

*Pockets of Potential: Using Mobile Technologies to Promote Children’s Learning*

## Emerging Mobile Technologies and How They Can Enhance Education

In *Pockets of Potential*, Shuler points to the pervasive use of mobile technologies as a means to increase productivity in numerous key sectors, including health, banking, politics and what she calls “citizen journalism” (uploading and disseminating media captured with cell phone cameras and video recorders to social networking sites like Twitter). Mobile technologies may have been originally marketed as communication and entertainment devices, but they are now playing a significant role in society at large.

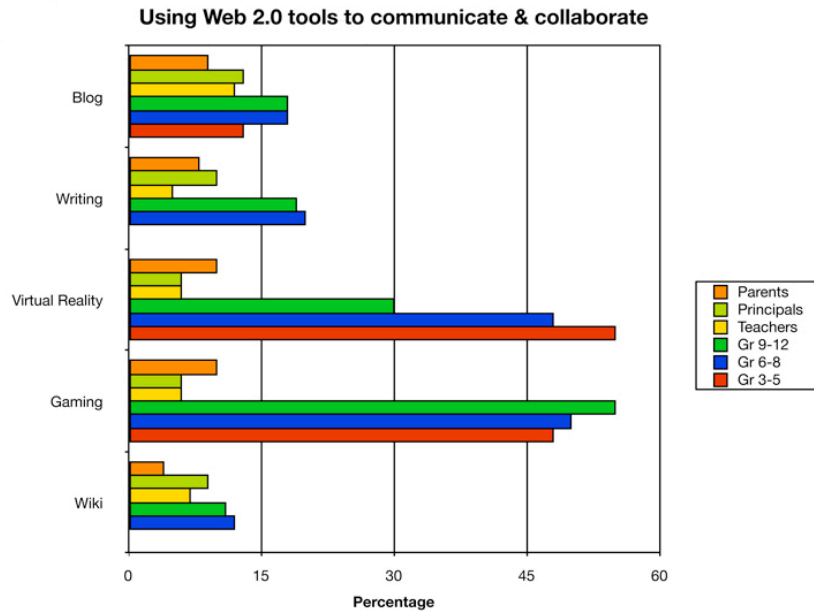
In exploring the role that these devices play in children’s lives, Shuler notes that, “perhaps the most ubiquitous technology in children’s lives today are mobile devices—tools such as cell phones, iPods and portable gaming platforms that traverse home and school...via the hands and pockets of children worldwide.”

Some additional statistics that show how mobile devices have become increasingly prominent in the lives of American children and youth:

- The Center on Media and Child Health (2008) predicted that 54 percent of American eight to twelve year-olds would have cell phones within the next three years. (qtd. in Shuler)
- More than 10 percent of four and five year-olds use a cell phone. (NPD Group 2008a, qtd. in Shuler)
- Over 50 percent of six to nine year-olds have their own portable video game player, 30 percent have their own cell phone and 20 percent have their own digital music player. (Sesame Workshop, 2007, qtd. in Shuler)
- Mobile device ownership among four to fourteen year-olds has experienced double-digit growth since 2005. (The NPD Group, 2008, qtd. in Shuler)
- 97 percent of U.S. college students own a cell phone and 79 percent own a mobile computer. (Snapshot, 2008)

While these devices are, on one level, a source of fun and entertainment, proponents of mobile learning believe they also have significant potential to

play a key role in supporting learning experiences. (Shuler, p. 13) According to the 2009 annual Horizon Report, produced by the New Media Consortium and the EUCAUSE Learning Initiative, “mobiles” on college campuses are becoming a versatile tool that can be easily adapted to a variety of tasks for learning, productivity and social networking. The report observes that for many students, broadband-enabled mobile devices like the iPhone are beginning to take on tasks that were once the “exclusive province of portable computers.”



## Envisioning Mobile Technologies in Education

Since 2003, researchers for the Speak Up National Research Project from Project Tomorrow have collected and shared the ideas of more than 1.5 million K-12 students, teachers, parents and administrators on education and technology. Their research has led them to describe students as a “Digital Advance Team” leading the way on leveraging emerging technologies for teaching and learning. “The technologies they use in their personal lives slowly infiltrate their schoolwork and many of these technologies ultimately have found a home in their school day, even with their teacher.”

Speak Up researchers asked students and educators specifically about their views on the potential value of mobile devices to support learning.

According to their findings, middle and high school students responded that if given the opportunity:

- 53 percent would use mobile devices to email, IM or text message their classmates.
- 34 percent would use mobile devices to email, IM or text message their teachers.
- 48 percent would work with classmates on projects both at home and at school.
- 32 percent would play educational games.



- 53 percent would conduct research on the Internet.
- 32 percent would record lectures to review and listen to them at a later time.
- 51 percent would like to receive updates about upcoming homework assignments and tests.
- 24 percent would access their school's website, content management system or portal.

(Speak Up Project, Project Tomorrow 2009)

When the researchers asked teachers what they thought about using mobile technologies for instruction, one-half said they believe that mobile devices can increase student engagement, while one-third said they could extend learning beyond the school day. One in four see mobile devices providing a way to personalize instruction and one in five think mobile devices could be used to develop critical thinking, communications and collaborative/teamwork skills. One-third believes that using mobile technologies in school prepares students for the world of work.

Teachers do see some prerequisites to using mobile devices in the classroom, including making sure all students have equitable access to devices and software, receiving professional development to learn how to use these devices effectively and providing ongoing technical support. The solution may lie in having students use their own devices and then spending funding on developing the infrastructure to support emerging technologies and training teachers.

## How Mobile Devices Are Being Used in Teaching and Learning

Mobile technologies are currently being used to enhance teaching and learning in classrooms worldwide. What are some of those uses and what are the results?

Here are a few representative examples from *Pockets of Potential*:

- A group of teachers in California is using iPods along with Belkin digital audio recorders to improve student reading. They've found that struggling students show increased motivation to improve their fluency skills when they hear what they sound like reading aloud.
- North Carolina's 2008-2009 teacher of the year asks her sixth and seventh grade students to translate passages from classic literature into "texting speak" to demonstrate their comprehension and to create a kind of multilingual focus, similar to how learning a foreign language can enhance a student's understanding of his or her native tongue.
- The School Empowerment Program in Kenya uses bulk SMS text messaging as in-service training for primary-school teachers and local support cadres across rural and urban areas, linking into other media used in their courses. Doing so provides access to much needed



pedagogical materials.

- In Singapore, the Learning Sciences Laboratory of the National Institute of Education is investigating the use of handhelds to facilitate inquiry-based learning of environmental issues. Primary students used handheld computers during field trips to examine how wastes are produced and what impact the “Three Rs” (Reduce, Reuse, Recycle) can have on protecting the environment.

A review of research on the use of mobile technologies in teaching and learning shows that a wide range of innovative schools, teachers and districts are experimenting in this area with excellent results.

In an Associated Press article by Christine Armario, “Teachers Using Cell Phones for Classroom Lessons,” she recounts how high school Spanish teacher Ariana Leonard, of Wesley Chapel, Florida, reinforces her students’ Spanish vocabulary skills by using their cell phones for a digital scavenger hunt, in which she sends them text messages in Spanish with directions to “find something green” or “take a picture with the school secretary.” Leonard’s students also use their cell phone cameras to copy notes and to receive homework reminders.

The article also reports on Passage Middle School in Newport News, Virginia, where twelve classes are now using cell phones in math, science and English. Some students use their phones’ text messaging and Internet browsing capabilities to do research, while others use the camera function to take pictures for photo stories and assignments. Students often work in groups in case some students don’t have phones. The article explores the concern of many educators that, if cell phones are allowed in the classroom, students would use them to cheat or take inappropriate pictures. Yet, these teachers who have incorporated cell phones into their classes report that most students abide by the rules and guidelines.

In a March 2009 article in *The Journal*, “Mobile Devices: Facing Challenges and Opportunities for Learning,” author Patricia Deubel describes several innovative uses of mobile technologies in education. She points out that learners are benefiting from accessing media on iPods, such as streaming videos for middle and high school science learners on the YouTube channel from Nature that can be uploaded to mobile devices. Math Dude video episodes for algebra from Montgomery Public Schools in Maryland are also optimized for play on an iPod. And in looking at achievement, she highlights the use of iPods by sixth grade teacher Richard Whittaker in Boise, Idaho, who loads class iPods with lessons that include video clips, homework assignments, quizzes, music, books on tape and more. These are used across all subjects, including English, math, social studies and reading. The technology has allowed his students to work at their own pace and to review lessons as needed. His prior year’s class achieved some of the highest achievement scores in the state. (Forester qtd. in Deubel)

In her *BusinessWeek* article, “Cell Phones Making Headway in Education,” Olga Kharif discusses a university instructor’s innovative use of familiar technology. Instructor Liz Kolb, who teaches courses for new teachers in Michigan, requires her students to try cell phone exercises with their students.

She says that when most of her teacher/students come to her class, they have no interest in using cell phones for learning. But by the end, 30 to 40 percent are having students use mobile technologies in the classroom to “create raps about math, answer foreign language quizzes and record theatrical radio programs.” (Kharif, 2008)

In an Associated Press article, “Classrooms Go High-Tech to Engage Students,” author Megan Scott profiles computer science professor Beth Simon at the University of California, San Diego, who is an example of an innovative teacher who does not ban students from using the Internet or cell phones in class. In fact, she encourages them to text message responses to her questions and research information on the Web while she lectures. Also highlighted in the article is Glenn Platt, professor of interactive media studies at Miami University in Ohio. He spends time in class focusing on critical thinking, problem solving and team-based learning. He creates mini-podcasts to explain difficult concepts and encourages his student to ask questions on their Twitter page to get answers instantly from their peers.

As these examples illustrate, mobile technologies have the potential to advance learning in creative and effective ways and can foster learning experiences anytime and anywhere. Mobile tools are evolving rapidly, with new interfaces and the ability to run applications that support many fields of study at all learning levels. They’re already making a major impact in some classrooms and are proving that they can complement the kinds of “on-demand” learning this generation craves.

### Interactive Whiteboards Go Mobile

As mobile computing technologies continue to become incorporated in the classroom, so do complementary technologies that redefine classroom communication and collaboration. Interactive whiteboards are gaining popularity as one of the technologies that make instruction and learning more engaging. These systems allow educators to create engaging, interactive learning experiences and save everything that’s created to share via email and the web—and now, even via eReaders like the Amazon Kindle.

Many educators are on the go these days and interactive whiteboards also have gone mobile. Luidia in particular has pioneered the ability for teachers to take interactive whiteboard technology from classroom to classroom, or wherever they go. The company’s eBeam Edge for Education system (<http://www.luidia.com/products/ebeam-edge-for-education-page.html>) transforms any existing whiteboard or any other flat surface into an interactive teaching space, for a fraction of the cost of traditional fixed whiteboard systems. This solution is ideal for:

- Teachers who share class spaces
- Special education resource teachers and their students
- Technology integration teachers who don’t have labs and who travel between classrooms
- Teachers who teach in different classrooms and who want to integrate notes from interactive whiteboard session with their own online resources, or who teach online learning courses

Luidia’s mobile interactive solution also improves communication and sharing

between educators who, when meeting in person or online, can collaborate on the digital whiteboard, write and capture notes, and share them digitally with others.

### Whiteboard Content on eReaders

There are many benefits to interactive whiteboard technology. As Jen Scott Curwood wrote in a recent *Instructor* magazine article (May/June 2009), “The Case for Interactive White Boards,” interactive whiteboards can “help promote student engagement and foster content area learning in a constructivist learner-centered classroom.” She summarizes several main benefits of interactive whiteboards, including increased student engagement and participation as well as the ability to appeal to students’ multiple intelligences, allowing teachers to reach students through a variety of mediums. Interactive whiteboards also help teachers to differentiate learning, especially for students who struggle in more traditional classrooms or those with special needs.

Interactive whiteboard technology effectively facilitates the content-sharing and focus on the interconnectivity of information that have become so popular in the Web 2.0 distributed environment. In addition to its ability to capture and save interactive sessions in various formats for use online or for sharing via email, Luidia’s eBeam software now allows users to send presentations, lessons and notes directly to an Amazon Kindle or Kindle DX eBook reader. The Kindle wireless reading device allows users to download books, blogs, magazines, and newspapers to a crisp, high-resolution electronic paper display that looks and reads like real paper. As a result, students can review class lessons and parents can see what children have studied in class—wherever and whenever they want.

## The Digital Generation -- Impacting the World of Learning

In conclusion, today’s students, or the “Digital Advance Team,” are the early adopters of technologies. They create new ways to use technology and are setting the pace not only for mobile learning, but Web 2.0 tools, online learning, digital content, and STEM career exploration (science, technology, engineering or math).

Speak Up researchers recommend that we listen to students to find out how they approach learning and living every day and to discover what challenges they face in learning in the 21<sup>st</sup> century. For most students, technology plays an integral role in their lives, enabling them to communicate, get organized, collaborate and create content for their learning. They’re already using technology to become strong communicators and participatory learners. “They develop strong teamwork skills (highly valued by employers as one of the most critical 21<sup>st</sup> century work skills) and view the process of content development as a key part of the new learning process—for many students the process of developing that content is as valuable, or more valuable, than the end result. Thus, the learning process is king today—not just the learning outcome.”

Tapscott echoes the idea that the learning process is key when he claims, “it’s not what you know that counts anymore; it’s what you can learn.” He states

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Grown Up Digital: How the Net  
Generation is Changing Your  
World. McGraw-Hill: New York.

that the “Net Geners” need a different kind of education than the baby boomers. The educational model needs to meet the needs of students in the fast-paced information age, where jobs continually change and lifelong learning is crucial. “The ability to learn new things is more important than ever...students need to be able to think creatively, critically and collaboratively; to master the ‘basics’ and excel in reading, math, science and information literacy and respond to opportunities and challenges with speed, agility and innovation. Students need to expand their knowledge beyond the doors of their local community to become responsible and contributing global citizens in the increasingly complex world economy.”

This is a tall order. Students today, however, are helping to lead the way in adopting technologies that will enable the kind of ongoing learning that they require. We can learn much from them if we’re willing to listen.

This paper is brought to you by Luidia, Inc. Learn more about Luidia’s portable interactive whiteboard solutions at <http://www.luidia.com>.

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