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Technology Literacy and the MySpace Generation

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They're not asking permission.

These are responses from my 15-year-old daughter, Hannah, and her friends, who are all freshmen at Northern California's Berkeley High School, regarding the safety of kids using MySpace. On a typical day after school, you'll find Hannah in her bedroom, iPod charging on the desk, headphones in ears, cell phone in one hand, paperback book in the other, television tuned to a *Gilmore Girls* rerun, and computer with display divided among iTunes, YouTube, a *Pride and Prejudice* DVD, and, of course, MySpace, which she constantly checks for messages from friends.

This portrait of a digital native is particular to the year 2007. It is not what we would have seen 10 years ago, and it's definitely not likely to resemble what we'll be seeing a decade down the line. So when we, as adults, bandy about the concept of technology literacy, inherent within that is the knowledge that technology and the digital native are constantly evolving.

Our challenge as educators, parents, and community members? How do we empower and protect our students in an environment that increasingly excludes us?

NET Standards

In 1997, the International Society for Technology in Education pioneered the first set of National Education Technology Standards in an attempt to define the new literacies and identify crucial skills for students and educators.

In the original set of standards, the skills revolved more around the mastery of technology tools and multimedia than behaviors, although social, ethical, and human issues were addressed. For example, students were expected to "use telecommunications to collaborate, publish, and interact with peers, experts, and other audiences," and "use a variety of media and formats to communicate information and ideas effectively to multiple audiences."

Says ISTE CEO Don Knezek, "The standards were something to shoot for."

Since then, and in the absence of any government-spearheaded federal education technology plan—in fact, despite ongoing deep cuts in the last protected bucket of technology funds (Enhancing Education through Technology)—ISTE has maintained stewardship of the NETS, with 49 states implementing some or all of the standards.

This past year ISTE began a refresh process of the NETS, inviting feedback from stakeholders on a new draft (see "NETS for Students"), with a target release date of June 2007. It is a sign of the times that creativity and innovation now top the chart of standards identified as essential for students and that cultural understanding and global awareness have also been elevated to crucial skills.

One person happy to see the evolution reflected in the new draft of standards is ed tech guru Alan November. A NETS critic from the start, November balks at the standards for trying to impose standardization at all and for their lack of foresight in not taking into account the rapid rate of technology change.

"It was downright embarrassing, like going to farms in Russia and telling everybody they have to milk cows in the exact same way," he says.

November cites the use of Logo in schools in the early '80s and the widespread belief then that all kids needed to know Logo. Later, educators were forced to acknowledge that Logo wasn't transferable to the real world. "Learning Logo would have been one of the standards," November remarks. "It wasn't thought through."

Although November concedes that the proposed new standards have come far, he remains critical.

"The devil is in the details," he says. "How do we implement these standards?" November cites the vagueness of the term digital media, for instance. "That could mean PowerPoint to one person or designing a Moodle course to share online to another," he says. Moreover, he decries the time and effort it will take for all 49 states to go back and "undo implementation" of the original standards.

Despite being no fan of standards ("What if we told Microsoft they had to standardize their software development?"), November is nevertheless dedicated to working toward a "positive outcome" for education and has plans to partner with Knezek toward that end. "Now they need some really imaginative examples, some national best practices, so people can have a sense of what they really mean."

Sun and Open Source

When technology literacy and the needs and activities of the digital native dovetail with the goals of business, global trends can be accelerated. Such is the case with Sun Microsystems, whose longtime promotion of open-source applications, such as its OpenDocument-based StarOffice application suite, is now placing the company in a leadership position for customizable applications.

Kim Jones, Sun's vice president of global education, government, and health services, has closely monitored the evolution of Web use in China, India, and other technologically developing countries. "The emerging digital student has been the impetus for the evolution of the Web from information source to participation," Jones says.

Beyond that, Jones is already talking about Web 3.0, which she characterizes as active and participatory, offering an open and flexible learning environment with content created by students. Jones sees multiple delivery methods as the trend for this environment that focuses on "learning, plus content, plus the ability to customize."

As for technology standards, not surprisingly Jones touts the need for open source over proprietary applications. And like November, she says the nation's educational system needs to reach out to the best and most innovative practices, including global learning models, such as Singapore's and Korea's approaches to teaching math, which have the best proven outcomes. Sun's global, participatory theme is also being borne out in a new offering for educators, the Curriki (curriculum plus wiki) open source, online, free, world-based curriculum that Jones feels should be part of any tech literacy standards.

Listening to the Students

Observing students and making decisions about what they should and should not do and know is one thing. Listening to them speak directly is another. At this year's Sun Worldwide Education and Research Conference in San Francisco, whose theme was Education 2.0, Santa Clara University's Lorrie Ma and Darian Shirazi of the University of California at Berkeley addressed an international audience of K-12 and college education professionals.

During an hour-long Q&A session with these students, three clear messages emerged:

Students want free and open access to information. "Teach kids to be careful about what they post on the net as it will be part of their proverbial permanent record," says Ma, who's double majoring in marketing and engineering. "But after discussing what's right, wrong, and appropriate, and arming students with that knowledge, back off with the rules and the filtering and let them take responsibility."

Shirazi concurs that school (at least from high school on up) is not a place for spoon-feeding. "I would rather sift through bloggers and other content and do my own iltering," he says.

Social networking hubs are here to stay and should not be constrained by schools. Sites such as MySpace and Facebook are the avenues of daily commerce for the digital native and therefore the most efficient means of communication. Students check these sites several times a day, circumventing more sluggish institutionalized avenues to accomplish tasks quickly and efficiently. Says Ma, "It's easier to go to a student's Facebook entry than to have to dig up their e-mail through the university system."

The face of education and the idea of the "campus" are changing. Shirazi speaks of the 80 percent of his time not spent in classes, but learning via podcast lectures, Googling for research, and discussions with peers at various campus venues such as the gym or a coffee shop. The student, who is in the process of starting up his own technology company, points to innovation and open source as key to learning. "I'd like to see as much software as possible go open source, so that others can build on it," he says. His advice for students entering the 21st-century workplace? "This is a cliché, but think outside the box, not about what it takes to get an 'A,'" he says.

Businesses and venture capitalist firms have given Carnegie Mellon the word that teamwork is an essential ingredient for leadership positions in the global, 21st-century workplace.

What Employers Say

The kind of innovative, self-guided learning students like Ma and Shirazi tell us are so central to the lives of digital natives are the same skills businesses say they're looking for in 21st-century employees. Moreover, it makes sense that as the schools of 1900 were responsive to the industrial workforce, so should schools today reflect the global workforce. New models are leading the charge.

In response to calls from venture capitalists and businesses sending a clear message about what they need, the San Francisco Bay Area-based Carnegie Mellon West recently announced a master's of science program in software management. With a nod to "globalization, outsourcing, and world-flattening advances in technology," this online course model emphasizes interdisciplinary training in technical, business, and organizational skills, recognizing all three as essential to leadership in a global economy. The program harnesses technology to offer real-world simulations, collaborative projects, and a variety of instructional methods, including team-based coaching, "just in time" feedback, problem-driven seminars, and more.

Diane Dimeff, Carnegie Mellon's associate dean for external relations and professional development and a

former K-12 and university educator, says K-12 students should be comfortable learning and operating in all such aspects of technology. In particular, she identifies technology exposure, teamwork, self-direction, and an interdisciplinary skill set as important technology literacies for all.

"The ability to adapt to constantly changing technologies, to use the Web for authentic research, and to work in teams for the greater good—knowing when to lead and when to follow—are essential for the global workplace," says Dimeff.

Tech Literacy and the Future

As we continue to move forward through the new century, as open source and other participatory Web venues become the norm, educators will be facing an even more overwhelming technology learning curve. A new digital divide is in our future, one that is largely generational. At its heart will be the fundamental questions of what "school" really means and whether digital immigrants can ever really get comfortable with a user-generated paradigm.

At a time when students are empowered by their own technology skills, are being asked to innovate and create by the global marketplace, and are no longer dependent on our "permission" to interact with the world's content and each other, what choice do we really have?

Susan McLester is editor in chief of T&L.

NETS for Students

To participate in ISTE's NETS Refresh project, visit www.iste.org/nets-survey.

I. Creativity and Innovation
Students think creatively, construct knowledge, and develop innovative products using technology. Students:

A. apply existing knowledge to generate new ideas and products.
B. use technology for creative self-expression.
C. use systems thinking to explore complex issues.
D. identify trends and forecast possibilities.

II. Communication and Collaboration
Students use digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning of others. Students:

A. collaborate, publish, and interact with peers, experts, and others employing a variety of digital media and formats.
B. communicate information and ideas effectively to multiple audiences utilizing a variety of media and formats.
C. develop cultural understanding and global awareness by engaging with learners of other cultures.
D. contribute to project teams to produce original works.

III. Research and Information Retrieval
Students access, retrieve, manage, and evaluate information using digital tools. Students:

A. locate, organize, analyze, evaluate, synthesize, and use information from a variety of sources and media.
B. evaluate and select information sources and technological tools based on the appropriateness to specific tasks.
C. process data and report results.

IV. Critical Thinking, Problem-Solving, and Decision-Making
Students use critical thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate technology tools. Students:

A. identify and define authentic problems and significant questions for investigation and plan strategies to guide inquiry.
B. plan and manage activities to develop solutions and complete projects.
C. collect and analyze data to identify solutions and make informed decisions.
D. use multiple processes and diverse perspectives to explore alternative solutions.

V. Digital Citizenship
Students understand human, cultural, and societal issues related to technology and practice legal and ethical behavior. Students:

A. advocate and practice safe, responsible use of information and technology.
B. exhibit positive attitudes toward technology uses that support collaboration, learning, and productivity.
C. demonstrate personal responsibility for lifelong learning.
D. exercise proactive leadership for digital citizenship.

VI. Technology Operations and Concepts
Students demonstrate a sound understanding of technology concepts, systems, and operations. Students:

A. understand and use technology systems.
B. identify and use applications effectively and productively.
C. troubleshoot systems and applications.
D. transfer current knowledge to learning of new technologies.

Characteristics of a Digital Native

Following is a compilation of characteristics of 21st-century learners gleaned from a variety of sources, including an American Association of School Librarians blog, high school and university student interviews, and Kim Jones, vice

president of global education for Sun Microsystems.

- Multimedia oriented
- Web-based
- Less fear of failure
- Instant gratification
- Impatient
- Nonlinear
- Multitasker
- Less textual, more modalities
- Active involvement
- Very creative
- Less structured
- Expressive
- Extremely social
- Need a sense of security that they are defining for and by themselves
- Egocentric
- Preference for electronic environments
- Have electronic friends
- Thrive with redefined structure
- Surface-oriented
- Information overload
- Widening gap to information access
- Share a common language
- Risk takers
- Technology is a need
- Aren't looking for the right answer
- Feel a sense of entitlement
- Constant engagement
- All information is equal
- No cultural distinctions (global)
- Striving to be independent

—with acknowledgment to Diane Beaman