

LISTENING TO STUDENT VOICES -- ON TECHNOLOGY

**Today's tech-savvy students are
stuck in text-dominated schools**

*A summary of available research on student attitudes,
perceptions and behavior on technology and its
current and potential role in K-12 education*

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ee education | evolving

*A joint venture of the Center for
Policy Studies and Hamline University*

ABOUT EDUCATION|EVOLVING

Millions of America's students head off to school each morning sporting brightly colored backpacks and determined to make this their "best school year yet." At the same time, federal and state policymakers are making tough new demands that our schools change and improve – so that "All students learn at high levels." New standards, tests, timelines and consequences are all being put in place to make sure that "No child is left behind."

Yet, all across the country, many policymakers, journalists, teachers, parents and students themselves are troubled by a haunting feeling that all this effort may not really produce the degree of change and improvement that we need. At a minimum, we are now taking a series of risks that are neither wise nor necessary to be making with other people's children. These are, after all, demands and results well-beyond what we've ever expected of American public education – all at a time of severe budgetary pressures on states, districts and individual public schools.

That, at least is the serious concern of a small group of Minnesota-based public policy veterans who have come together as Education|Evolving... a joint venture of the Center for Policy Studies and Hamline University. Education|Evolving is undertaking a number of initiatives during the current year. They include a national initiative to convince policy makers, education reform leaders, journalists and others that *creating new schools* should be an essential element in achieving needed changes and improvements in teaching and learning – at least equal in importance to *changing the schools we now have*.

One focus of this initiative is to introduce the concept of an "Open Sector" – to help create the kind of legal and political environments in which new schools can be created and succeed. Another is challenges the fundamental premise that teachers in schools must always be "employees."

Education|Evolving's leadership is provided by two Minnesota public policy veterans: **Ted Kolderie**, senior associate at the Center for Policy Studies, and **Joe Graba**, a senior policy fellow at Hamline University. Its coordinator is **Jon Schroeder**, former director of Charter Friends National Network. Education|Evolving's activities are regularly updated on the initiative's unique and continually refreshed web site www.educationevolving.org. To receive print and electronic updates of Education|Evolving initiatives, contact info@educationevolving.org.

ABOUT E/E'S STUDENT VOICES INITIATIVE

Education/Evolving's student voices initiative, "Real Impact: Student Opinions for a Change," integrates diverse student opinions with adult-level discussions that influence decision-making around schools and education. For two years, Education/Evolving has been bringing the voices of charter and alternative school students into adult discussions. In 2005, we are formalizing and expanding our efforts to include student voices from all types of schools (charter, alternative, home, district, magnet) and all achievement levels.

The initiative's Web site may be found at www.educationevolving.org/studentvoices. It includes Education/Evolving papers that integrate student opinions with education policy and school-design discussions. Additionally, the site features links to other sites highlighting student opinions and a section where students can communicate their opinions on a variety of "hot topics" so journalists, educators, and policymakers can also facilitate the integration of student ideas into education and school redesign efforts.

Education/Evolving also gathers student opinions through interviews and by providing settings for students to design and conduct research—using their own questions; their own language; their own write-ups of the findings. For more information or to become involved, contact info@educationevolving.org.

Tech-savvy students stuck in text-dominated schools

A summary of available research on student attitudes, perceptions, and behavior

The latest in a series of reports on the changing face of public education

DECEMBER 2005

STUDENT VIEWS HAVE IMPLICATIONS FOR EDUCATION POLICY DECISIONS

Students rarely have a place at the table during K-12 decision-makers' discussions about education policy and school design. Across the nation, however, it has become increasingly popular among research organizations and various media outlets to ask students their opinions.

Education/Evolving's initiative, "Real Impact: Student Opinions for a Change," integrates student opinions with the policy-making by connecting what students can do and want with current debates about how to improve K-12.

This report summarizes available literature reporting student attitudes, perceptions, and behaviors when it comes to using digital technology, particularly for learning. The report is divided into two major sets of findings. The first set describes our nation's increasingly tech-savvy students and the various ways in which they use computers and the Internet. The second outlines students' frustrations with our nation's still text-dominated schools as well as students' ideas for how adult education policy and school designers could better meet their needs.

Today's high school students are highly tech-savvy

There are a variety of findings demonstrating students' increasing tech-savvy. They include:

FINDING #1

Computer and internet use is growing

- As reported in "Connected to the Future: A Report on Children's Internet Use," by the Corporation for Public Broadcasting, time spent using digital media by children between the ages of 13 and 17 has now surpassed the time they spend watching television (U.S. Department of Commerce 7).
- In 2002, 83 percent of family households reported computer ownership, with 78 percent having Internet access. In fall of 2002, 99 percent of public schools in the United States had access to the Internet, and had expanded Internet access into 92 percent of instructional rooms (U.S. Department of Commerce 7).
- In 2004, fully 93.4 percent of college students owned a computer. Freshmen own laptops more than they own desktops; while seniors were exactly the opposite (Kvavik 2). More and more, students are showing a preference for portable, multi-functional devices (U.S. Department of Commerce 10-11).
- Seventy-eight percent of children between the ages of 12 and 17 go online (Levin & Arafeh ii). Nearly every online

teen (94 percent of 12 to 17 year olds who reported using the Internet) has used the Internet for school or research (Lenhart, Simon, & Graziano 1).

- In 2003, 80 percent of students in grades 6-12 told NetDay that they have at least one email address and 22 percent have four or more email addresses. Likewise, 76 percent of the students have at least one instant message (IM) screen name and 26 percent have four or more IM personal screen names (NetDay 21). These numbers changed very little in a 2004 NetDay survey (81 percent have at least one email address; 75 percent have at least one IM screen name) (U.S. Department of Commerce 8).

FINDING #2

Students are sophisticated users

Many students say they use technology at “a fairly sophisticated level,” especially when compared with their teachers. Some students notice a digital divide, however, between students with high and low-levels of access to computers and the Internet. One study shows that students use technology well to accomplish assigned work, but their application knowledge and ability to solve problems using technology is generally not sophisticated.

- Regardless of their race or socioeconomic status, or of whether they have access to a computer from home, students are using technology “at a fairly sophisticated level” (Murray 1).
- As students get older, their use of technology becomes more sophisticated, but, comparatively, the younger students are on a faster track to becoming greater technology users and advocates (NetDay 6).
- Eighty-seven percent of students participating in NetDay’s 2003 focus groups ranked themselves as intermediate to expert-level users of the Internet. One-third ranked their teachers as beginners (NetDay Press Release).
- In the classroom, it is apparent to Internet-savvy students when a classmate does not have access to the Internet. Indeed, students with easy Internet access assert that they

have a clear and persistent advantage over their peers with little or no access (Levin & Arafah 24).

- In a quantitative survey, college students rated themselves highly skilled in the use of communications, word processing, and the Internet. Qualitative follow-ups indicated that the same students are skilled with basic office suite applications, but know just enough technology functionality to accomplish their work. They have less in-depth application knowledge or problem-solving skills (Kvavik 4).

FINDING #3

Technology is important to students’ education

Students strongly assert that technology is important to their education.

- According to a 2003 NetDay study, 91 percent of students in grades 7-12 said technology helps them with their assignments. Sixty-seven percent said they would conduct an Internet search or visit a bookmarked Web site if assigned to write a report or essay today about a topic they knew little or nothing about (Murray 3-4; NetDay 23). As reported in “Parents, Kids, and the Internet,” by Princeton Research Associates for the Pew Internet in American Life Project, 94 percent of students of ages 12-17 go online to do research for school assignments. In the same survey, 71 percent of students said they used sources found on the Internet most frequently in the last big report for school—by far the largest source of information (U.S. Department of Commerce 7). Thirty-four percent of students of ages 12 to 17 have downloaded a study aid and 17 percent have created a Web page for a school project (Lenhart, Simon, & Graziano 1).
- The 2003 NetDay study indicated that far fewer students would opt to visit a school library to find a book on the topic (10 percent) or ask their teacher for help (9 percent). Even fewer said they would turn to textbooks (Murray 3-4; NetDay 23). A 2004 NetDay study showed that only a quarter of students report using books and magazines from

a library (U.S. Department of Commerce 7). In 2003, most self-assessed advanced technology users said they would turn to the technology-based solution first, but just 46 percent of self-assessed beginners would do the same. This poses a challenge for teachers and schools, which must address both cohorts (NetDay 23).

- Students say that when they use the Internet, their motivation to learn and their academic performance improve. They complete their schoolwork more quickly; they are less likely to get stymied by material they don't understand; their papers and projects are more likely to draw upon up-to-date sources and state-of-the-art knowledge; and, they are better at juggling their school assignments and extracurricular activities (Levin & Arafeh ii).
- Students say that schools and teachers use technology most effectively in science, social studies or history, and English (NetDay 23). These are the same subjects in which students indicate teachers are most likely to assign them work that requires Internet use (Levin & Arafeh 16). Students cite math and reading as subjects that might benefit from the use of learning technologies (U.S. Department of Commerce 5). Students say math teachers are least likely to use Internet in their classrooms (Levin & Arafeh 16).
- In 2004, almost 65 percent of college students (most of who graduated from high school by 2000) ranked "convenience" and "saving time" as the biggest benefit of using technology in the classroom. Nearly 13 percent said the most valuable benefit was improved learning (Kvavik

FINDING #4

Technology is not an 'extra'

To students, technology is not an extra, but an essential, when it comes to learning.

- Students view textbooks as informational relics; they want the most up-to-date information at their fingertips, edited in real time (Murray 4).
- Eighty-two percent of students in grades 6-12 said the loss of Internet access would have an impact on their school

work; 78 percent said the same about their personal life (NetDay 24).

- "We don't pick up dictionaries anymore—we go to Dictionary.com. We don't walk to the library—we search online journal databases. We wouldn't know an archive if we stumbled into it on the way to the fax." (Windham 6).

FINDING #5

In-school access to technology is limited

Students lament that despite technology's importance to their learning, and the frequency with which they use technology to complete school assignments, their access to computers and the Internet at school is very limited. Students believe the decision to improve access is in teachers' hands, but that teachers' power to do so can be negatively influenced by administrators' decisions about in-school access.

- High profile public policy initiatives at the federal, state, and local levels have focused resources on improving the professional development of teachers to integrate technology into their classrooms and whole new categories of school personnel—state, district, and school instructional technology coordinators—have emerged to assist with technology planning and implementation. The vast majority of students say that while they do indeed rely on the Internet to complete their schoolwork and manage their day-to-day educational activities. Yet students report that there is a substantial disconnect between how they use the Internet for school and how they use the Internet during the school day and under teacher direction. Students' educational use of the Internet generally occurs outside of the school day, outside of the school building, outside the direction of their teachers (Levin & Arafeh iii, 14).
- Given the pervasiveness of email and IM in their "outside of school" lives, it is incongruent to students that they do not have those same capabilities available in school (NetDay 24).
- Students report that, even inside well-connected schools, there is a wide variation in teacher policies and attitudes

about Internet use by students in and for class. Teachers decide whether to allow the use of the Internet (often as a supplement to other sources and tools), or even forbid its use (Levin & Arafeh iv). From students' perspective, a teacher's decision to make an assignment involving use of the Internet is influenced by many factors: the ease of in-school access to the Internet, the school's orientation toward the use of the Internet, a teacher's Internet skills and knowledge, and a teacher's sense of whether students have home access to the Internet or not (Levin & Arafeh 16).

- Even those students who attend highly-wired schools describe a school environment that often discourages their use of the Internet. They are frustrated by their inability to go online at school. Many believe that these frustrations arise because teachers do not see educational value in providing abundant Internet access, or because of fears about inappropriate material on the Internet (Levin & Arafeh 23).
- Within a school, access to the Internet is largely controlled by teachers—teachers whom students describe as being motivated primarily by fear of what might happen if students use the Internet inappropriately. Some adults might believe that this is perhaps justified by the fact that students reported that some students do use the Internet inappropriately at times to view adult-oriented sites, to shop while in school, to pirate and download music, etc. (Levin & Arafeh 19).

FINDING #6

Home use dominates

Students use computers and the Internet most frequently from home.

- Eighty-four percent of students say that they use technology regularly as part of their schoolwork, but only 27 percent indicate that school is the prime location for that activity. Home is students' preferred location (NetDay 23).
- Among students of ages 12-17 who go online from more than one location, 83 percent say they go online most

frequently from home, while only 11 percent say they go online most frequently from school (U.S. Department of Commerce 8).

- In a 2003 study by Grunwald Associates, both students and their parents expressed dissatisfaction with the amount of time students are able to be online at school. Of the students who have Internet access at home, 49 percent say they have too little time online in school, and 34 percent of their parents expressed the same concern. A similar study by Grunwald Associates in 2000 found that 27 percent of 9-17 year olds and 17 percent of their parents thought students they had too little time online while at school (Greenspan 1).
- Perhaps students' preference for accessing technology at home is related to the Grunwald Associates' finding that more than three-quarters of students aged 6 to 17 believe their Internet access in the classroom is often slower than their home connections (Greenspan 2003).

FINDING #7

In-school use is not integrated

When students do use technology at school, it's more often in computer labs than in classrooms and time-limited rather than integrated into the school day.

- The Grunwald Associates found that [while at school] students most frequently access the Internet from computer labs or media centers (Greenspan 1). A NetDay 2003 study indicates that while at school, 49 percent of the students use technology in a computer lab and 30 percent use it in a classroom (NetDay 23). Peter Grunwald of Grunwald Associates says, "Leaving the classroom means that students will often have less time online and their usage will also be less successfully integrated with their instruction" (Greenspan 1).
- Students say that many schools confine Internet use to certain times of the day or certain places in the building (especially computer labs) (Levin & Arafeh iv).

- Students say that time for technology use in-school is limited. Within a typical six-hour school day, students routinely move from place-to-place and from teacher-to-teacher. There is simply not much time within the [current, traditional] school day for students to be sitting at Internet-connected computers. Skipping lunch to be able to access the Internet for 10 or 15 minutes during the school day was seen as an acceptable trade-off for some students who felt they needed that little extra in-school access. That situation contrasts sharply with the online experiences of students who are well-skilled with the Internet once they leave school. Students are simply much more in control of their time out of school than inside it (Levin & Arafeh 18-19).

FINDING #8

Computers and the Internet are communications tools, first

Students say they use computers and the Internet first as communication tools. Then, as tools to complete schoolwork. But the word “tools” is an adult framework imposed by study designers. Students don’t view email and instant messaging as technology tools, but as a fundamental way to interact and relate to their peers (NetDay 21).

- While students’ use of IM and email may appear to adults to be trivial communications, students are in fact advancing a new communications style that is based upon instant feedback and short bursts of information exchange. Students view online communications as a very personal exchange medium, not a cold impersonal machine-to-machine operation as many adults do. Students know more of their friends’ IM screen names than their home phone numbers (NetDay 21).
- Some students see an advantage to the less-personal nature of email when communicating with adults. “It’s not that we can’t use the telephone or find an office, it’s that it’s just so much more difficult. Using email to set-up meetings, ask simple questions, or send in excuses for absences has become so commonplace in the modern

classroom that few students turn to anything else. Email is less personal and less frightening. You don’t have to worry about saying the wrong thing or getting flustered. You can carefully craft your message and spell-check the result. It’s much easier to take risks and push the envelope without hearing disapproval or confronting anger. For that reason, [students] will turn to email for everything from job inquiries and applications to meetings with administrators” (Windham 8).

- In the NetDay 2003 study, 73 percent of students in grades 6 through 12 said they communicate with friends and family living outside their area at least twice a month (NetDay 21). In 2004, a NetDay study revealed that 60 percent of students in grades 6-12 email or instant message adults such as family members, teachers or coaches on a weekly basis (U.S. Department of Commerce 8).
- When EDUCAUSE asked college students how technology affected various classroom activities, the highest scoring effect was “helped me to better communicate with the instructor”. Other significant scoring effects were “resulted in prompt feedback from the instructor,” “helped me communicate and collaborate with my classmates,” and “I primarily use information technology in course to improve the presentation of my work” (Kvavik 8).
- Some students view instant messaging and chat groups as ways to collaborate on schoolwork and homework (U.S. Department of Commerce 21). They collaborate online to brainstorm school projects with classmates, seek help with homework from a tutor, exchange information, conduct research, plan social activities, and chat with friends (Murray 2; NetDay 6).
- Contrary to high school students, college students report that they use technology first for educational purposes, followed by communication. But the college students use technology for both purposes at very high levels. Students report using computers for writing documents (99.5 percent) and emails (99.5 percent), followed by surfing the Internet for pleasure (97.2 percent) and for classroom activities (96.4 percent) (Kvavik 2).

FINDING #9**Metaphors describe how students use the Internet for school**

According to Doug Levin and Sousan Arafeh, authors of “The Digital Disconnect: The Widening Gap Between Internet Savvy Students and Their Schools,” students make reference to five different metaphors for how they think about and use the Internet for school: as virtual textbook and reference library; as virtual tutor and study shortcut; as virtual study group; as virtual guidance counselor; as virtual locker, backpack, and notebook. These metaphors are not mutually exclusive. They operate in parallel fashion in students’ minds. The most Internet-savvy students are able to shift effortlessly and unconsciously among any or all of them during any one online session (Levin & Arafeh 6-7).

The Internet as virtual guidance counselor

- One hundred percent of students who participated in NetDay focus groups in 2003 said they have used the Internet to seek information on colleges, careers, and jobs (Net Day Press Release 1).
- Students use the Internet to help select which college to attend, prepare for college admissions examinations, and complete college applications (Levin & Arafeh 12).
- Some students view using job search sites, such as monster.com, as a way to learn more about what is required of workers in various industries and what sort of salaries they might expect. This information, students note, is not typically available from guidance counselors and parents (Levin & Arafeh 13).

The Internet as virtual textbook and reference library

- Students say they view the Internet as a way to find material on subjects they want to pursue in more depth. It is also a source for information about subjects they find difficult to comprehend in school. Many find the information and study aids on the Internet genuinely useful in completing their day-to-day assignments. Finding the right source of information can be difficult, but when they

find it, the Internet often means the difference between understanding a topic or not. The Internet provides ways of presenting material that differs from how it is presented in school. Other students note that using the Internet is a way to complete their schoolwork as quickly and painlessly as possible, with minimal effort and minimal engagement (Levin & Arafeh 9-10).

The Internet as virtual tutor, study short-cut, study group

- Nearly all students who participated in “The Digital Divide” focus groups said that they or other students they know sometimes use online study or tutoring sites as shortcuts to completing schoolwork or for completing assignments (Levin & Arafeh 10).
- Students use virtual study groups at will. Sometimes these study groups are synchronous—that is, students collaborate in real-time together. At other times, the collaborations are asynchronous. Virtual study groups occur with some time delay between communications to account for, say, dinner with parents or the time spent watching a television show. Students also use them to instantly trade references to Web site links and to share papers for a presentation on which they are working. Face-to-face study groups, on the other hand, can be difficult to arrange and difficult to drop in and out of. Virtual study groups allow students more control over their time and a way to more easily share materials as they simultaneously undertake both online and offline tasks (Levin & Arafeh 12).
- Students say that online tutoring and counseling resources have characteristics their teachers do not offer. The online resources are always available. The resources have a “patient” character and are nonjudgmental. They allow students to be anonymous, and allow students to do many things at the same time (Levin & Arafeh 13).
- Students say they would like more opportunities to communicate with their teachers outside of class via email and instant messaging for extra help. In lieu of that opportunity, they currently turn to other resources external to their school on the Web (Levin & Arafeh 11).

The Internet as virtual locker, backpack, and notebook

- Students say that sending notes and papers to themselves online saves time and is more convenient than printing and carrying around (Levin & Arafeh 13-14).

FINDING #10**Technology has caused students to approach life differently; but adults act as though nothing has changed**

Students are approaching their life and daily activities differently because of technology (NetDay 6), but adults still employ age-old learning programs. Adults design serial learning activities, while students are multi-taskers. Adults give students assignments with “how to” instructions, while students say they learn better by trial and error. Yet-unchanged school libraries and adults’ ideas about personal learning spaces are out-of-date.

- “With information and accessibility lying effortless at my fingertips, I have grown accustomed to juggling multiple tasks at once, at lightning speed. In the average online conversation with a friend, for instance, I am likely to be talking to two others, shopping online at Barnes & Noble, laughing out loud at *Friends* reruns, and printing off notes from a chemistry lecture. It is only in the classroom, therefore, that my mind is trained on one subject” (Windham 4).
- While online, 30 to 40 percent of students are frequently multitasking: conducting research for a paper, printing an online study guide for a book they are reading, downloading music, instant messaging simultaneously with dozens of friends, emailing other friends, and preparing a PowerPoint presentation for class the next day (Levin & Arafeh 4).
- Whether it be news, shopping, or paying bills, technological advances have made it possible for [students] to access services anytime, anywhere. They have grown accustomed to doing business after midnight or shopping after two o’clock in the morning (Windham 9).

- According to Jason Frand in “The Information-Age Mindset: Changes in Students and Implications for Higher Education,” for today’s young students, doing is more important than knowing, and learning is accomplished through trial and error as opposed to a logical and rule-based approach (Kvavik 1).
- “It is not enough for us to accept a professor’s word. Instead, we want to be challenged to reach our own conclusions and find our own results. Lessons last longer, in our minds, if we understand the relevant steps to reach them” (Windham 5).
- Students say they learn more about technology from informal networks—personal exploration at home from friends and parents and self-experimenting. Forty-eight percent of students say they learned about technology on their own (Murray 3, NetDay 22).
- Students think today’s school and community libraries are out-of-date. They have limited selections of multimedia, while online sites routinely offer downloadable graphic images, photographs, animations, video, and sound. School and community libraries require students to wait in line to check out books or other materials and pay to use a copier machine to duplicate important material for projects and reports. Material online, however, can be printed onto a local printer. Reproducing [quoting or otherwise] material in reports and projects without the Internet requires students to re-type it. Online material can be virtually cut-and-pasted directly into digital reports, presentations, and papers. And, students say, visiting the virtual library can be done while wearing pajamas, eating a snack, listening to music, chatting with friends (via IM or email), and making sure your little brother or sister isn’t getting into trouble while parents out running errands (Levin & Arafeh 8).
- “In middle school...we were told that the best way to study was to isolate ourselves from the television, the tape player, and the busy sidewalks outside the window. We were to clear a nice study corner, with a comfy chair, good lighting, and ample work space. If Harcourt Brace were to evaluate my college study space, it would—no doubt—be

the antithesis of healthy study habits pictured in one of their textbooks. There would be no clear desk, no silent cocoon, no harsh lighting. Instead, Law and Order reruns would be playing in the background. To my left, a trail of jumbled cords would stretch from my bedroom to a laptop on the couch cushion. My IM buddy list would be minimized on the screen, but noise alerts would be turned on to tell me when friends signed on or off the Internet. A collage of browser windows would remain open, one directed to CNN.com to read the day's news between chapters, another to my email to know exactly when the next piece of mail arrived, and then another to Google, in case the text raised any questions. Somewhere in the middle would be me and a history textbook" (Windham 4).

Students frustrated by high schools still dominated by text

Adults, who are often not sure of how to integrate technology and education, do more to stymie, than to embrace, student's ability to use technology. This section outlines students' frustrations with our nation's still text-dominated schools as well as students' ideas for how adult education policy and school designers could better meet their needs.

FINDING #11

Students desire increased in-school access

Students want adults to increase opportunities for access to computers and the Internet, particularly in-school.

- According to Paul Hagner, there is an ever increasing expectation on young students' part that new communication paths be used (Kvavik 1). Students want to expand their active online lives into their school environment (Murray 2-3). Students want better coordination of their out-of-school educational use of the Internet with classroom activities. They argue that this

could be the key to leveraging the power of the Internet for learning (Levin & Arafeh iv).

- Students urge schools to increase significantly the quality of access to the Internet in schools (Levin & Arafeh iv).
- Whether in person or on the Web, current student habits (such as multi-tasking and the ability to access services 24-7) demand a new evaluation of hours of operation and staff accessibility (Windham 9).
- Outpolling having online classes and online textbooks by nearly three to one, the one thing students want to change about technology at their school is to be allowed do use instant messaging and email. Students rely on these technologies to complete group projects and to discuss school assignments (Murray 2).

Students want adults to focus more on "how to improve" than on "how to restrict" students' access. Since students mainly use the Internet at home (where they can access all sites) as part of their daily routine, students say the restrictions ultimately only limit schools' liability while stymieing students' in-school use even for educational purposes.

- Students say their schools and teachers have not yet recognized—much less responded to—the fundamental shift occurring in the students they serve and in the learning communities they are charged with fostering. And, when teachers and schools do react, often it is in ways that make it more difficult for students who have become accustomed to using the Internet to communicate and access information (Levin & Arafeh 5).
- Students urge that there should be continued effort to ensure that high-quality online information to complete school assignments be freely available, easily accessible, and age-appropriate—without undue limitation on students' freedoms (Levin & Arafeh v).
- It is common for schools to place social and technological restrictions on students' use of the Internet by, for instance, employing surveillance systems or requiring special teacher or administrative approvals (Levin & Arafeh iv).

- Students complain that blocking and filtering software applications often raise barriers to students' legitimate use of the Internet (Levin & Arafeh iv).
- Many students describe schools that do not allow them to access their outside email accounts, and the vast majority of students are not provided with school-sanctioned email accounts. In many cases, schools also prevent students from using IM technologies, saving their files to the school network, visiting Web sites that teachers do not explicitly authorize them to visit, and—in perhaps the most extreme case—perform “right clicks” of their mouse to launch a (seemingly) innocuous pop-up menu within the Microsoft Windows operating system (Levin & Arafeh 20).
- In a 2003 NetDay study, students reported that gaining access at school remains a problem. For students in grades 7-12, the most frequently cited obstacles are a lack of time during the school day, slow Internet access, school Web filters and firewalls, not enough computers, and non-functioning computers (Murray 4).
- A middle school girl said, “At our school, we’re not allowed to use the Internet any more because some students were getting into bad stuff. Then [teachers and administrators] take it out on us.... We have to go to the administrator—we have to ask her and she has to give us permission. Then we’re allowed to go on it” (Levin & Arafeh 19).
- Students say that Big Brother watches them; and Big Brother often assumes the worst of them. A high school girl reported, “There is a way for them to get into our computer. You can be doing things and they can just take over your computer. One day I was emailing a friend some work when she was sick at home. The monitor told me I shouldn’t be doing that. The principal came down and when they read it they said ‘O.K.’” (Levin & Arafeh 19). Another high school girl said, “There are lab people who have a monitor and can send a message to say, ‘You shouldn’t be doing this.’ I was looking up cattle one day, and the message said, ‘you can’t be here and you have to get off of it’” (Levin & Arafeh 19).
- A high school boy said, “A lot of time when you use the Internet at school, you’ll get on a site—even for educational purposes—and you’ll be blocked out... They don’t think you can handle it, so it hinders your research. I went on to the history page and I typed this thing about a country that I was doing and they wouldn’t let me see it and it happened four times and it got on my nerves so I stopped using the Internet for [the project]” (Levin & Arafeh 20).

Students want adults to focus on improving the Internet to be more kid-friendly and to have more language diversity. If adults are going to restrict access, it should be “bad” Web sites’ access to students.

- Many students want a kid-friendly Internet, where there are no “bad” Web sites, viruses, pop-up ads, spyware, or hackers. They also want the Internet to include more material that is appropriate for school-age people, including kid-friendly search engines and information on Web sites presented at a level that students can understand. Students also ask for Web sites that don’t contain factual errors (U.S. Department of Commerce 13). This is likely a result of students feeling penalized in their grades for citing false information they received from the Internet; for not effectively recognizing which sites contain valid information.
- While many students rely on the Internet as a virtual textbook and reference library, it can also be a cause for frustration and anxiety. Perhaps the single greatest irritation facing students is their use of search engines that point them to online information that is not trustworthy or understandable to them. Students said that it is often hard to find information online that is specifically related to the topic they are exploring and comprehensible at their age and grade level. (Levin & Arafeh 9).
- Students express concerns about frequent interruptions by online advertisements, many of which have distinctly adult overtones to them. The persistence of these distractions stymies students, discourages them from using the Internet,

and ties up their Internet connections and computers (Levin & Arafeh 9).

- A number of students feel that the Internet lacks sites written in languages other than English. They said they would like greater language diversity online. They want such sites so that they can communicate in a language they are studying or in their primary or secondary language (Levin & Arafeh 9).

Students report that adult reactions to the “digital divide” between students with high and low-levels of access to computers and the Internet tend to further limit all students’ ability to access technology.

- The vast majority of students report that since not every student has access to the Internet outside of school, their teachers do not make homework assignments that require use of the Internet (Levin & Arafeh iv).
- Some teachers try to take advantage of the extra “something” that students with high-levels of access seem to possess by asking them to share their skills and knowledge with classmates. Other teachers try to limit these students and their Internet access in an attempt to reduce the very real differences between the experienced users and their less tech-savvy peers (Levin & Arafeh 5).
- Students would like policy makers to take the “digital divide” seriously and begin to understand the more subtle inequities among teenagers that manifest themselves in differences in the quality of student Internet access and use (Levin & Arafeh iv).
- Some teachers are at a loss for how to accommodate students who are highly-skilled in Internet use or do not even recognize that their students have an increasingly new set of needs and expectations for learning that are based on using the Internet (Levin & Arafeh 5).

Ideally, students want adults to work toward “any place computing” for students, which students could put to educational and personal use.

- If students could, they would design a new school with fast, wireless access throughout the school building, new computers so students could go online anywhere in the school, and computer labs that stayed open after school and on weekends (Murray 4). Students in an open-ended survey by NetDay in 2004 also indicated that their quality of access could be improved in the following ways: a computer for every student, which they could take home for doing homework, faster computers, faster Internet access, wireless technologies, and Internet access (U.S. Department of Commerce 13).
- Essentially, students want “any place computing.” They want access to computers and the Internet at any time—day and night—including access to school networks from home (U.S. Department of Commerce 13).
- Students want access to digital platforms for collaborating with others on schoolwork and homework. Platforms include chat rooms, instant messaging, and email. Collaboration includes peer-to-peer, student-to-teacher, and student-to parent (U.S. Department of Commerce 13).
- Students believe that if technology were more readily available, they would learn more, school would be more fun, student projects would be better, and students would get higher grades in class and on tests (Murray 4).
- Students want decision-makers to spend technology funds to buy more computers and better software for student use (Murray 4).
- Ideally, many students want a small computer. Frequently they describe this device as a handheld that you could put in your pocket, which they could use for homework and storage of digital textbooks. Whatever it is, they would like it to be multi-functional (CD player, DVD player, calculator, digital camera, text and instant messaging, Internet access, Web address book, music player, cell phone, TV, USB port, printer, dictionary, thesaurus, atlas, watch, study guides, and more). Some see this device as a way to free themselves from heavy and cumbersome backpacks and paper textbooks. Many would like voice-

activated and touch screen computers (U.S. Department of Commerce 9).

FINDING #12

Students want to use technology to learn, and in a variety of ways

- Many students are interested in learning from games—especially in math and science (U.S. Department of Commerce 21).
- Many students want to witness and experience historic events, or study foreign cultures, first-hand via some sort of virtual world (U.S. Department of Commerce 21).
- Many students express interest in taking online or computer classes, and many express interest in taking online or virtual classes from their homes. Some mentioned that this would be a way to keep up or go to class when sick (U.S. Department of Commerce 21).
- Students want to do school work on the computer or online. This includes, generically, doing some or all work at school on the computer or online, as well as doing homework on a computer, online, or at a Web site. Students specified the following ideas: taking notes using a computer; using online tests, quizzes, and worksheets; taking online practice tests and quizzes; and having access to ongoing assessment of student learning performance. Some students expressed a desire for a Web site specifically related to the work they are doing, or the subjects and textbooks they are studying in school. Others proposed online study tools and guides, and project guides. Some students had interest in using email or instant messaging as a way to receive school assignments, to get help from the teacher, or to turn in homework (U.S. Department of Commerce 21).
- Many students are interested in using e-books or online textbooks (U.S. Department of Commerce 22).
- Students are highly interested in an intelligent tutor/helper for use in school and at home. They also want a single, all-knowing information resource. Some specific ideas include

a live tutor at a Web site, an online tutor or counselor, or a holographic or virtual tutor. Another idea is a homework helper, such as help Web sites, a homework checker, or an online study buddy (U.S. Department of Commerce 17).

FINDING #13

Students want challenging, technologically-oriented instructional activities

Students want teachers to employ technology to create challenging instructional activities. Students believe this would improve their attitude toward school and learning. Today, adults are using technology primarily for course management, which students find useful, but too one-dimensional.

- A few students are interested in a personal Web-based work site for scheduling, and for following their assignments and grades online (U.S. Department of Commerce 21). Some schools already use course management software to post syllabi, track grades, share materials with students, to provide feedback on assignments, for online readings and tests, and more.
- College students say that course management software features used least by faculty were the features that students indicated contributed the most to their learning, such as sharing materials with students, faculty feedback on assignments, and online readings (Kvavik 12).
- Students say the quality of their Internet-based assignments was poor and uninspiring. They want to be assigned more—and more engaging—Internet activities that are relevant to their lives. Many students asserted that this would significantly improve their attitude toward school and learning (Levin & Arafeh iv).
- While students are able to relate examples of both exciting and poor instructional uses of the Internet, they said that the not-so-engaging uses were the more typical of their teachers' assignments" (Levin & Arafeh 16).
- A high school girl said, "A[biology] teacher made us go online and take surveys; it was the stupidest thing I've ever

seen in my life. We did surveys on the parts of a frog we knew. It was pointless and dumb” (Levin & Arafteh 16).

- A high school boy said that his school has him use a career-matching program. “It’s pretty worthless and a waste of money. It helps you decide what to do after high school. It told me I should be a bowling machine repairman. I swear it said that. It is ridiculous” (Levin & Arafteh 17).
- Findings from an EDUCAUSE survey of college students confirm students’ disenchantment with the way in which adults currently use technology in schools. Almost 31 percent of college students preferred taking courses that use extensive levels of technology, but only 2.2 percent preferred courses that are delivered entirely online. Nearly 26 percent preferred limited or no use of technology in the classroom (Kvavik 5). One student said, “I feel like I have lost part of the vital student-teacher connection” (Kvavik 6). If technology is used well by the instructor, however, students come to appreciate its benefits (Kvavik 6-7).

FINDING #14

Students want adults to move beyond using the ‘Internet for Internet’s sake’

As multi-taskers who value collaboration and hands-on learning, students want adults to move beyond using the Internet for its own sake and instead commit to using it to design and implement creative, challenging, and interactive instructional activities.

- Students are uniformly more interested in—and see more value in—doing schoolwork that challenges and excites them than in simply using the Internet for its own sake (Levin & Arafteh 24).
- College students believe that software applications, by themselves, do not contribute to an improved learning experience. It is incumbent upon the faculty member to understand the promise and performance of these tools in support of improved learning and to use them accordingly. Data suggest that we, as a society, are at best at the cusp of employing technologies to improve learning (Kvavik 10).
- “Teachers have assumed that putting their courses on the Web would give students more flexibility to shape their

own learning experience. We could read at our own pace. We could respond to message threads at our leisure. We could even take tests with the full support of our text and notes... [But] the advent of the Internet and the opportunity of the online classroom have not diminished the need for traditional educational principles like discipline, engagement, and interaction. Instead, classes like this are what students despise—one-dimensional exercises in learning and regurgitating facts” (Windham 6).

- It’s a common misconception that students take online courses to avoid the rigor and workload of a traditional classroom. In many cases, that’s simply not true. When students choose an online classroom, they still want to be challenged. They still want exploration. And they still want creativity. Students are not likely to excel in an environment where they are simply handed material and expected to recite it. Instead, most log on to online courses because they despise this traditional format of lecture and regurgitate. Instead, they feel they learn better in an environment where they can teach themselves. With that in mind, the online professor must find ways to offer students a method of exploration and research within the curriculum (Windham 7).
- “Teacher’s use of a singular learning technology should be kept short and alternating, producing a class period as diverse in structure as it is in content. The best example of a multimedia classroom comes from a three-hour seminar I participated in on the Vietnam War. Though the prospect of spending three hours in the same cramped classroom was daunting, the professor employed a variety of media to keep our attention. Class began with a song from the period, and film clips were used throughout to illustrate key themes or replicate events. The lecture alternated discussion interspersed with photographs, tables, and graphics. As a result, most of us were more alert and interested in this class than in previous 90-minute classes” (Windham 5).
- Despite students’ high levels of technology use, their need for human connection is not diminished, and many

students crave actual conversation and interaction with classmates. To capitalize on this need, teachers should encourage interaction both within and outside the classroom (Windham 5). Online discussion forums are a natural solution and teachers can facilitate them by posting questions for students to respond to, or as simply a “free for all” for student discussion. The professor must be an active participant and facilitator, however, or students will diminish the exercises’ importance (Windham 7).

- Students cite interactivity as an attribute needed in learning, as well as the need for digital tools to provide step-by-step instruction or problem-solving, even repeatedly in case the student didn’t master the material in the first few attempts (U.S. Department of Commerce 22).
- In a world where technologies change daily and graduates armed with four-year degrees are entering the workforce in record numbers, there is an increasing fear among students that a four-year degree will be neither relevant nor sufficient preparation when it becomes time to enter the work force. Consequently, students are consistently looking for practical applications in a real-world context. Adults should focus more on the notion of extension, or applying the lessons that students are learning in the classroom to real-life problems, institutions, or organizations in the community instead of presenting a laundry list of future occupations or examples of the field in the news (Windham 5).
- Students believe that professional development and technical assistance for teachers are crucial for effective integration of the Internet into curricula (Levin & Arafeh v).
- A high school boy discussed a positive experience of a teacher effectively incorporating technology. “I had a little group for my history class where, we, everybody in the class had to do a project, and my group was doing a painting of the west pediment of the Parthenon, and we had to use the Internet to find out what the sculpture actually looked like so we could paint it, because we had no idea what the sculpture looked like, and couldn’t paint it, which...and this would have been extremely hard to get

without the Internet, we had to find the names of all the people in the sculpture and who they were, and we succeeded” (Levin & Arafeh 17).

FINDING #15

Students want to learn the basics, too

As adults more creatively integrate technology, students want them to incorporate some basic skills, too. Not only skills related to technology-use, but also basic research skills.

- Modern classrooms, faculty, and libraries must still teach and demonstrate basic research skills, such as finding journals, evaluating primary sources, and digging through archives. Many of today’s students believe they can learn solely from the Internet, but they cannot (Windham 6).
- Some students have an aversion to experimentation. One college student stated, “I know that I am clueless. I am so afraid. I am petrified that I am going to do something wrong.” The student described that he had tried to get rid of some viruses on his computer and somehow deleted the driver for his sound card. No one had been able to get it back for him (Kvavik 5).
- Contrary to expectation, college students have not gained the necessary skills to use technology in support of academics outside the classroom. An EDUCAUSE survey found a significant need for further training in the use of information technology in support of learning and problem-solving skills (Kvavik 12). Also, it cannot be assumed that they come to college prepared to use advanced software applications (Kvavik 5).
- Students maintain that schools should place priority on developing programs to teach keyboarding, computer, and Internet literacy skills (Levin & Arafeh v). Students hold misconceptions about basic things like how to use search engines, how computer viruses are contracted and spread, and how their privacy might be compromised online—just to cite a few examples. Students with better Internet skills and greater knowledge of education Web sites had a significant edge over other students (Levin & Arafeh 24).

Report methodology

Education/Evolving developed this memo by reviewing literature it gathers on the Web site for its student voices initiative, “Real Impact: Student Opinions for a Change,”:

www.educationevolving.org/studentvoices/

The Web site contains a clearinghouse of links to research and articles featuring student opinions on various education policy topics.

The methods used to prepare reports frequently cited in this memo are as follows:

- Findings from NetDay’s “Voices and Views” national report are from a self-selected, convenience sampling of 143,942 students in grades 6-12 participated in the 2003 NetDay Speak-Up Day survey. Exactly 42,882 students provided their views through an individual online survey tool; 101,060 students participated via a group or class-facilitated discussion and survey. Topics discussed in the Murray article are based on this research.
- Data from the NetDay Press Release is based on focus group research conducted by NetDay. Methods are not available, but the release reports that groups were conducted across the nation, in urban and rural areas, in 2003.
- The Greenspan article covers the Grunwald Associates’ 2003 report, “Schools and the Internet,” available online at: <http://www.grunwald.com/surveys/si/index.php>. Education/Evolving did not review the report for this literature review, but relied on citations in the Greenspan article.
- The “Visions 2020.2” report produced by the U.S. Departments of Commerce and Education and NetDay presents data from the 2004 NetDay Speak-Up Day Survey. A self-selected, convenience sampling of 160,000 students participated, with 62 percent of students attending grades 6-12. Public and private schools from both urban and rural areas participated, and, in about one-fifth of participating schools, underrepresented groups constituted the majority of the student population. Additionally, more than 55,000 students answered the question, “What technologies would you like to see invented that you think

will help kids learn in the future?” Findings presented in the report are based on an analysis of 8,000 answers.

- “The Student’s Perspective” by Carie Windham is one student’s view on how colleges could better incorporate technology to enhance student learning. Since Windham’s perspectives were similar to those of students in the larger survey, Education/Evolving included her comments to enhance adults’ understanding of the other studies’ findings.
- In “Convenience, Communications, and Control: How Students Use Technology,” Robert Kvavik reports on findings from a study by the EDUCAUSE Center for Applied Research (ECAR), using both quantitative and qualitative data. Exactly 4,374 students replied to a 2004 quantitative Web-based survey. The margin of error is plus or minus five percentage points. The students were mostly traditional-age college students from 13 institutions in five states. Qualitative data were collected by focus groups and individual interviews conducted at six of the 13 participating schools.
- “The Digital Disconnect” by Doug Levin and Sousesan Arafeh was conducted by the American Institutes for Research, and was commissioned by the Pew Internet & American Life Project. Data for this study were collected between November 2001 and March 2002 through focus groups and the online solicitation of student stories. A total of 136 public and middle high school students, drawn from 36 different schools, participated in the focus groups. Nearly 200 middle and high school students from across the country wrote and submitted stories through the study’s Web site.
- Findings from “The Internet and Education” by Amanda Lenhart, Maya Simon, and Mike Graziano of the Pew Internet & American Life Project are from a survey/tracking poll of 754 students, ages 12 to 17, who use the Internet and one of their parents or guardians (total of 1,508 persons interviews). The survey was conducted by Princeton Survey Research and Associates between November 2, 2000 and December 15, 2000. The margin of error is plus

or minus four percentage points. The report also contains quotes from teenagers who participated in an online discussion group of students ages 13 to 17, facilitated by Greenfield Online.

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About this report and its author

Today's students believe they are tech-savvy. They report, however, that their schools are more *text*-dominated and are not yet effectively integrating digital technology and student learning.

These and other findings are presented in this publication, *Tech-savvy students stuck in text-dominated schools*, which summarizes available literature reporting student attitudes, perceptions, and behaviors when it comes to using digital technology, particularly for learning. The summary also highlights what students want adults who influence education policy decisions to know about how students use technology and how schools could better meet their needs.

Kim Farris-Berg, coordinator of Education/Evolving's *Real Impact: Student Opinions for a Change* initiative and public policy consultant, prepared this review of literature. Kim is an education and public policy consultant based in Orange County, California.

ABOUT THE CONCEPT OF AN ‘OPEN SECTOR’ IN EDUCATION

Much of the work being done by Education|Evolving is to help create and sustain an “Open Sector” in public education – in Minnesota and elsewhere in the country. By “Open Sector,” we mean a “space” in public education that is open to new entrants – new schools that are started from scratch by teachers, parents, community organizations and multi-school networks. The “Open Sector” is also open to new authorizers or sponsors – entities other than school districts that oversee schools. The “Open Sector” is open to new learning programs and to new ways of governing and managing schools. And, as part of a broadening definition of public education, the “Open Sector” is open to all students who choose to attend schools in that sector.

The “Open Sector” is based on the premise that we cannot get the degree of change and improvement we need in education by relying only on fixing the schools we now have. And, to get enough new schools that are fundamentally different, we need a combination of public policies and private actions that will allow new schools to emerge and that will create an environment in which they can succeed. This kind of positive environment for creating and sustaining new schools can be established on a state-level through actions led by state policy makers. It can also be done – and is certainly needed – in major urban communities all across America.



Though chartered schools may be the most visible part of the “Open Sector” today, this concept of a positive environment for creating and sustaining successful new schools is not limited to charters. The “Open Sector” can also include schools operating within a district or state on some kind of contract other than a charter – as long as they are truly autonomous, accountable and open to all students who chose them.

There is also no prescribed or uniform learning program presumed by this vision for creating many more schools new. In fact, there’s an urgent need to better understand, respect and address the individual differences in students. It’s likely, however, that successful new schools in the “Open Sector” will be smaller and that they will make it possible for all students to take a more active role in their learning and to develop more direct and nurturing relationships with adults.

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Kim Farris-Berg, coordinator of Education|Evolving’s *Real Impact: Student Opinions for a Change* initiative and public policy consultant, prepared this review of the available literature. Kim is an education and public policy consultant based in Orange County, California. Final editing and production supervision was provided by E|E’s coordinator, **Jon Schroeder**.



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