

Acceptable Use of Technology in Schools: Risks, Policies, and Promises

Barriers to greater ubiquity of pervasive computing systems in formal educational contexts come in the form of legal policies, moral standards, and institutional responsibilities.

Mobile technologies and social applications are nearly ubiquitous in the lives of many of America's youth. Mobile device ownership and social media use have been increasing over the past few years: 93 percent of US teens go online, 73 percent use social networking sites,¹ 75 percent own a cell phone, and 66 percent use text messaging² (see Figure 1). Children under 12 are one of the fastest-growing segments of mobile technology users, and 93 percent of six-to-nine-year-olds live in homes with a cell phone.³ However, despite students' strong connection with the digital world and media environments and these systems' potential to improve learning,^{4,5} they're rarely used in US schools, where students spend a significant percentage of their time—more than 1,200 hours annually.

In formal school settings, teachers, administrators, and other stakeholders must negotiate a complex set of issues when addressing the use of mobile phones and other portable networked devices. Efforts to integrate technology in schools include investment in curriculum development and difficult purchase and installation decisions. In addition, numerous legal and policy issues contribute to the risk/benefit assessment. These challenges have meant

that, to date, few educational applications using mobile phones have been developed for the classroom.⁶⁻⁸

To explore mobile technology's potential to facilitate learning, the community at large must consider this technology's use in schools as a complement to an understanding of its impact outside schools. Specifically, schools' *acceptable-use policies* represent the current legal basis and historical precedents that define the climate of mobile phone and social media use in classrooms. Understanding these policies is an important first step toward creating a workable solution as a joint community of teachers, researchers, and designers. Rather than holding teachers responsible for adapting teaching practices to technologies, or holding designers responsible for adapting technologies to teaching practices, we explore how to address these issues together.

This article speaks to a broad audience, including

- developers, who have designed products for the classroom but aren't seeing rapid adoption;
- educators, who are both mobile-technology practitioners and purveyors of knowledge about their use; and
- researchers, whose future work in this area will determine the nature of ubiquitous computing in school environments.

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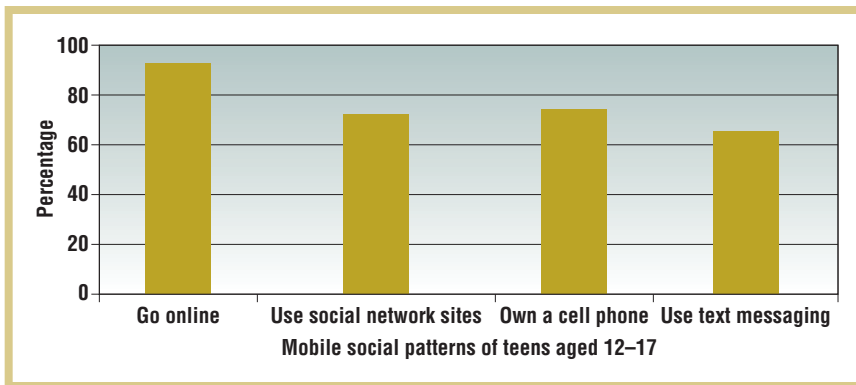


Figure 1. Teens’ mobile phone and social media use has risen in the past few years. Teens are using these devices and applications at school, though not necessarily for school-related purposes. Given the widespread nature of these practices, it’s important to understand the impact in school settings.

Our data and analysis are drawn primarily from literature and legal reviews. Where appropriate and necessary, we describe our own experiences working in US public schools as both practitioners and researchers during the past several years. Our corpus of data includes thousands of hours of participant observation, direct observation, and interviews. These interviews focused on the design and evaluation of netbooks and their applications in K–12 (elementary and secondary) classrooms as well as the design and evaluation of classroom-specific tools for special education.

Potential Benefits of Mobile Technology in Schools

Many pundits and researchers argue that mobile devices and social media applications promise “anytime, anywhere learning” and support new pedagogical approaches for an age of connected learners.^{3,9} Schools must continually adapt to the influx of technology and new societal demands, including the push for 21st-century skills such as critical thinking and problem solving, as well as student-centered and project-based learning models.

Much like adults, students use their mobile phones and social media for both socializing and work-related activities. Students’ work usage patterns are “closely related to the daily tasks and activities in their young lives,”¹⁰ including managing schoolwork and scheduling activities. Outside school hours, students have reported tex-

ting to coordinate school projects, researching on the Internet to prepare for tests, sharing tips and shortcuts in social networks, and participating in online study groups.

Mobile technology can open up new possibilities for on-the-go and just-in-time learning.³ Research has shown that mobile phones can address underserved, hard-to-reach children, especially those who can’t attend school regularly or don’t have alternative means of accessing digital resources.¹¹ Mobile devices extend peer-based learning to outside the classroom setting: social media has encouraged peers to learn from each other instead of drawing from adults’ authoritative knowledge. Peer-based feedback scaffolds learning by surrounding individuals with others who are invested in similar outcomes. Computer-mediated communication could also limit the dominance of certain peers, as has been repeatedly shown with adults.¹²

Furthermore, as the Digital Youth Project shows, students create knowledge, establish identities, build relationships, and participate in other activities that have important implications for social and cognitive development.¹³ According to the project’s researchers, “youth are picking up basic social and technological skills they need to fully participate in contemporary society.” In fact, online activities are complex and often require skills and confidence with technology and communication strategies. Using

networked technologies in classroom activities lets students interact with devices and applications they use in everyday life.¹⁴ The project’s researchers assert that “youth can benefit from educators being more open to forms of experimentation and social exploration that are generally not characteristic of educational institutions.”¹³

Of course, such experiments don’t guarantee success, and educators should undertake interventions with some caution. Mobile devices might not find a place in the classroom. Once-novel technologies such as the television also held similar promises to change the nature of schooling but aren’t particularly widespread means of formal teaching and learning. Mobile phone use in education requires pedagogical compatibility, including designing learning environments with a focus on cultural responsiveness and situated learning. Even if schools adopt mobile phones and associated pedagogies, developing content and effectively integrating it in the curriculum might be a slow process. As previous technologies have shown, the device can often be much less important than the development of content and practices to enable learners to reach educational objectives in new ways.

The Tension between Present and Future Goals

When considering the use, misuse, and control of mobile phones and social media in schools, we must also consider education’s role in socializing young people. Students’ engagement with educational materials, including

social media and pervasive computing systems, is an individually constructed experience that helps them learn about the world around them. The education system has an enduring social structure comprising roles, responsibilities, processes, and traditions that carry social meaning. What's more, education is a moral institution that serves society as a whole, focusing on what it should do for its members and adding a moral dimension to the activities that happen in it. Specifically, schools have a moral character in their rules, dress codes, student governments, and so on. Consequently, their policies on technology use both implicitly and explicitly define what's normal and what's right and wrong. So, schools are both places for individual and collaborative sense-making and places where students learn about morality and society's expectations of them.

Education is more than learning a prescribed curriculum. Children and teens learn constantly, and formal education might simply be an attempt to adjust what they would learn naturally into what the adults of a society want them to learn. Thus, educational systems can be seen both as descriptions of what's currently important in society, including social roles, and as prescriptions for what society wants for the future.¹⁵ The tension between representing today's standards and preparing students for the future requires schools to continually negotiate what is and isn't suitable for the classroom.

These negotiations have left students without access to many of the technologies that are familiar in other aspects of their lives but not yet considered appropriate in the context of schooling. A 2002 Pew Internet Research report revealed that students find a "substantial disconnect between how they use the Internet for school and how they use the Internet during the school day."¹⁰

Restrictions and bans don't keep mobile devices off school premises or eliminate their use. Students often hide their use from teachers and adminis-

trators, whether or not it's for school purposes, and teachers and other staff often hide mobile device use from administrators and students. During our fieldwork, teachers regularly noted that they would like to employ novel uses of networked devices in their curriculum but were restricted by policies that prevented technology use for various reasons, including lack of technical infrastructure, network security regulations, possible disruptions, and lack of parent and staff support. In the schools in which we conducted our work, responses from administrators about whether they'd actually punish any teachers caught violating these policies varied dramatically from school to school and even—in the same school—from teacher to teacher. Almost universally, when teachers used phones in class for learning and other work-related tasks, such as communicating with parents, they hid these practices from administrators.

US schools are at a delicate tension point. There's the inherent desire to maintain social propriety as defined over the past several decades of formal education. However, many educators favor the development of a more individual student-centered learning model, often through the use of novel technological solutions. As moral and political institutions, schools will likely play a significant role in developing and transmitting societal rules about these

cial learning environments.

Acceptable Use

In response to these myriad complex issues, most US schools have acceptable-use policies to regulate mobile phone and social media use. Mobile phone and pager bans were established in the late 1980s and early 1990s in response to fears that students would use these devices to traffic drugs¹⁶ and that usage would disrupt classrooms and control structures.

Beyond the Ban

For many reasons, mobile phone and social media bans in US schools have become unrealistic and even undesirable.³ Parents and educators no longer fear that student cell phones are primarily tools for drug deals and other criminal activities. In addition, parents and other stakeholders have pushed for increased acceptance of these devices for "emergency use" so that students can coordinate relatively benign events, such as rescheduling a carpool, and are prepared in the case of true crises, such as a school shooting.

Although complete bans are unrealistic, evidence exists to support the formulation of appropriate rules and regulations. Increased use of cell phones and mobile devices for phone calls and other purposes—for example, social networking, instant messaging, SMS (Short Message Service), and

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technologies, based on their potential risks and benefits. For example, e-mail and mobile phone etiquette, understanding of security and privacy risks, and preparation for the workplace in terms of online reputations and contributions are all issues schools will face because of their inherent position as so-

blogging—has brought about new concerns for schools, parents, and regulatory bodies.

For example, mobile phones specifically have come under much scrutiny regarding "sexting," the practice of sending or receiving sexually suggestive nude or nearly nude photos or videos.

Sexting isn't just a moral concern for educators and parents; it's also punishable under child pornography laws. As legislators and lawyers in some states are attempting to change the offense from a felony to a misdemeanor specifically for minors, laws are emerging to deal with possession of such images on mobile phones, "increasingly the locus of teens' personal, and seemingly private communication."²

As a result of such challenges, most states now place the authority to determine electronic communication's

institutional control, and puts schools at risk for lawsuits. Consequently, administrators generally develop acceptable-use policies to protect schools from these threats.

Defining What's Free Speech

Whereas safety is an overt goal of acceptable-use policies, protection of free speech is the dominant issue in relevant case law. Acceptable-use policies are binding contracts that students and parents enter into at the beginning of each academic year. However, these

is protected or subject to disciplinary action, schools struggle to define what's on campus as opposed to off campus in light of new technologies that blur these lines. A school entity can be disrupted or threatened by speech acts that originated away from school grounds, and mobile phones and social media can make certain speech acts more visible and persistent. Recent case law has exposed incidents in which websites, social networking profiles, and instant messages created off campus were thought to have compromised school safety.

In some off-campus cases, courts have ruled that disciplinary action against students wasn't warranted. This includes cases involving a parody profile of a school principal (*Laysbuck v. Hermitage School District*, 2007) and an e-mail of a top-10 list regarding a school's athletic director (*Killion v. Franklin Regional School District*, 2001). In other off-campus cases, courts have upheld schools' disciplinary actions—for example, the cases of a YouTube video depicting the killing of a teacher (*O.Z. v. Board of Trustees of Long Beach Unified*, 2008) and a hate website directed at an algebra teacher (*J.S. v. Bethlehem Area School District*, 2002). Given that technological devices and networks are increasingly used in a variety of physical locations, a wide array of behaviors involving mobile social technologies obscures the boundaries between places such as home and school.

Acceptable-use policies are already changing in response to speech acts occurring outside school property, a trend we expect will continue. One such change is the inclusion of "reasonable foreseeability," a test put forth in *Wisniewski v. Board of Education of Weedsport Central School District* (2007). A report to the leadership of schools in Southern California recommended policy changes that would further delineate the nexus of acceptable off-campus use and the schools' interest.¹⁷ If the speech act doesn't

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role in the classroom in the hands of local school boards. These boards consist of elected or appointed officials, educators, and community members who represent the school districts' interest, determine policy, and lobby for and allocate resources. State statutes now allow—and, in some cases, require—local stakeholders to establish policies concerning the possession and use of mobile phones, social media, and computational devices on school property, including disciplinary measures.¹⁶ These policies reflect the legal obligations and rights of schools and the governments that support them, as well as address concern for student and teacher well-being and school reputation.

A safe school environment protects students from physical harm and creates a space where they can focus on learning. Students concerned for their well-being or safety will unlikely make substantial academic gains. Mobile phones and social media can be avenues for "hate speech" or other illegal speech that's threatening and hurtful to students or faculty, undermines

policies must adhere to the legal rights that the federal government has guaranteed students, including the right to free speech at school, secured in the First Amendment of the US Constitution and confirmed in the 1969 seminal court case, *Tinker v. Des Moines School District*.

Most legal cases we discuss here center on the schools' rights to protect students and faculty and the students' rights to free speech. Not every form of speech is protected. School administrators and teachers are obligated to discipline students for lewd, profane, or indecent speech; threats of violence; drug trafficking; or other speech acts that interfere with others' rights at school or during school-related activities (*Bethel School District v. Fraser*, 1986; *Lovell v. Poway Unified School District*, 1996; *Morse v. Frederick*, 2007; *Tinker v. Des Moines School District*, 1969). If a communication device is involved, it needn't be school property for a student to commit an offense; indeed, in many court cases, the devices belonged to the students or their parents.

In establishing whether a speech act

directly reach the school campus, such as a website that wasn't accessed or created at school, it's put to a test in which an adult determines whether the information would have eventually reached the school and caused disruption. Reasonable foreseeability gives schools the right to discipline students for speech acts committed off campus when a material disruption of and substantial interference with others' rights exist. Designed to alleviate the confusion surrounding the school's authority to manage off-campus speech acts, this test should result in more elaborate policies addressing both on- and off-campus use.

Risks for Schools and Students

Schools' usage patterns and policies are shaped not only by the desire to minimize liability but also by the risks of social media and networked devices for students as users.

Perceived Risks

A glance at any news website or parenting magazine exposes the vast array of perceived risks of engaging with social media and pervasive computing technologies. However, stories in the popular press can misrepresent research and generate panic about issues such as dangerous online solicitations. In reality, online solicitation is incredibly nuanced.

Findings from the Youth Internet Safety Surveys, commissioned by the Center for Missing and Exploited Children, revealed that one in seven youth has been sexually solicited online.¹⁸ These and similar reports have prompted most schools to deploy Internet filters and blocks on websites, instant messaging, and other social media. But blocks meant to protect students are much harder—if not impossible—to enforce when mobile devices are involved and students no longer need the school network for access. Furthermore, it's unclear whether the blocks prevent solicitation. A recent

literature review from the Berkman Center for Internet and Society reiterates that Internet sex crimes haven't contributed to a rise in sex crimes against minors.¹⁸ This report establishes that the most frequent threats online are from bullying by known peers. However, sexual predation remains a concern, and more research is necessary.

Most teens use social media and mobile phones to strengthen relationships that they've established offline, not with strangers. It's not uncommon for adolescents to congregate in unmoderated spaces (physical or online).¹³ When students can access virtual spaces anywhere, anytime, parents and schools must consider a much broader definition of unsupervised or unmediated peer interaction. Beyond students' ability to interact with strangers, school policies must consider time spent with friends in unsupervised locations where much of their activity is supposed to be monitored.

Another recent study receiving attention from the popular press states that one-third of teens with mobile phones admitted to using them to cheat at least once in school.¹⁹ Although these numbers are alarming at first glance, prompting reactions to "cybercheating," the report doesn't discuss the frequency or conditions under which the

cheating occurred. Furthermore, students reported ambiguity as to what they considered cheating (for instance, telling a student in a different class about a surprise quiz).

Our fieldwork, although not quantitative and thus difficult to compare directly to these results, indicates that teachers are also unclear on the definition of cheating in modern learning

paradigms. New technologically mediated learning environments and curricula often sanction the use of other materials (for example, online research and building off other students' work in online environments) that might not have been allowed just a few years ago. Researchers must examine how students use mobile phones and social media in situations of academic dishonesty. In particular, we must seek to understand whether these devices do in fact make cheating easier and, if so, whether this ease makes cheating more prevalent.

Observed Hazards

Many longtime school problems, such as bullying, "at-risk" youth, and classroom disturbances, are facing new complications regarding mobile devices and social media. In addition, one possible new problem is student multitasking.

Bullying. Online bullying (also called cyberbullying or online harassment) is a substantial concern for educators. According to the Internet Safety Technical Task Force, online bullying can involve "direct (such as chat or text messaging), semipublic (such as posting a harassing message on an e-mail list), or public communications (such as creating a website devoted to making fun of the victim)."¹⁸ This can seriously

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harm victims, who can experience depression, loneliness, lower grades, and absenteeism. Online bullying becomes a school concern when it's connected to the student's well-being and a liability if it involves the school location or school peers.

In some ways, cyberbullying differs from in-person bullying. Cyberbullies aren't restricted by distance, and their

reach can be extended within the online environment. They might not be bullies in the “real” world; rather, they might consider the Internet a place to exercise more dominance and aggression than they would in person. (Interestingly, this effect mirrors the workplace, wherein computer-mediated communication tends to flatten hierarchical power interactions.¹²) Current school policies consider bullying a serious offense, and schools must respond to the new trends in student harassment.

At-risk students. Mobile technology’s possible effect on at-risk students—those who are potential dropouts, failing academically, or performing below grade level—is another area of concern for schools. Studies show solicitation, victimization, and online harassment aren’t correlated to a particular type of social media (for example, Facebook) or practice (for example, SMS-based texting). Instead, risk online is statistically correlated with risk offline.¹⁸ Students struggling with a poor home en-

vironment, physical abuse, depression, and substance abuse tend to make poor choices and might find themselves in undesirable situations online.

concern for teachers—and likely the one that comes to mind most readily when considering mobile phone use in schools—is the potential disruption to the classroom environment. Teaching is a challenge; teachers must manage students’ diverse needs and behavior to meet an entire school year’s worth of established goals in a timely manner. Mobile phones can undermine the classroom’s paramount learning objectives, in which decorum, order, and control are valued.

Teachers and administrators have posted to blogs (for instance, www.common sense media.org/cheating-goes-hi-tech) with complaints about in-class student behavior involving mobile phone and social media use. These statements often describe mobile device use in classrooms no differently than passing notes or whispering between students. Like other disruptive activities, then, mobile phone use can be managed by teachers who engage their students and provide proper guidance. Teachers have always diverted student

of people who engaged in substantial multitasking as youth differed measurably from that of those who hadn’t.²¹ It’s unclear what these changes mean in terms of long-term human cognitive and emotional capabilities; researchers are continuing work in this area.

Parents and teachers, both in these reports and in our fieldwork, have been less concerned about multitasking than about productivity, etiquette, and rudeness or distraction. New rules and coping strategies should ensure that cross-generational expectations regarding these issues are met.

Discussion

As educators must begin to understand pervasive computing technologies, researchers need a solid understanding of classroom dynamics and management strategies to develop technologies that support the realities of formal K–12 learning environments. Experts in pervasive computing, educational technology, and teaching must work together to establish best practices for integrating technology into classrooms, using mobile devices and applications to augment school tasks rather than distract from them.

We must continually ask ourselves where pervasive and mobile technologies fit in formal schooling and where educational technology’s boundaries lie. Examining mobile devices’ and applications’ roles in teenagers’ lives lets us think differently about educational technology and education itself. Many researchers argue that pervasive computing systems, including mobile and networked devices and the mobile social applications running on them, could support sociality and learning in schoolwork and overcome some known barriers to learning by influencing pedagogical change. Schools can be sites for building interest in and understanding of social media. However, as we discussed earlier, substantial barriers to adoption and use still exist, with only preliminary evidence of educational outcomes from the use of

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Educators have long known that these offline issues are tied to academic performance; they must now address online risks as well. We predict that schools would fare better if they didn’t target any particular device or media but rather focused on interventions for at-risk youth that include education and resources addressing risky online practices.

Classroom disruption. A significant

attention away from potential distractions and toward the task and material at hand—which is difficult but doable.

Multitasking. In 2006 and 2010, the Kaiser Family Foundation produced two reports on concerns about multitasking. The 2010 report stated that “development of mobile media has allowed—indeed encouraged—young people to find even more opportunities throughout the day for using media,” with minority youth being the heaviest consumers of media content via mobile phones.²⁰ The 2006 report noted that the brain structure and function

these technologies, often in university settings. We should seek scalable positive educational outcomes for K–12 education.

For mobile devices to become truly pervasive in learning environments, designers and researchers must also acknowledge current and transitioning acceptable-use policies as keys to understanding the school environment and administrators' and parents' legal duties. The design implications drawn from this analysis wouldn't force pervasive technologies to fit perfectly in the tight contextual box that these policies create. Instead, acceptable-use policies regulate speech and expose how speech and technology can be conflated. So, the challenge of developing mobile technologies for learning is determining how to enable free speech in a way that makes sense in the schooling environment.

On the basis of our initial survey of the landscape, we offer the following thought experiments about pervasive technology design for classrooms. These aren't prototypical recommendations or even suggested designs for future systems. Rather, they're meant to provoke critical thought.

First, rather than ban text-based chatting in classrooms, educators could capture and share these conversations. This solution is analogous to encouraging students who are having side conversations in pairs or small groups to share their discussion with the class. What would be the result of such an intervention? Almost certainly, some students would "game" the system, intentionally using it as a stage on which to perform. Others might avoid using the technologies altogether, and still others might use the system to ask public questions on the lecture anonymously. Regardless of the specific result, it's interesting to think about how educators can use communication technologies to foster discussion—and yes, perhaps a little mayhem—in the classroom.

Second, rather than block participa-

tion on social networking sites during school hours, schools might build lessons into the curriculum about appropriate behavior in online environments and encourage students to use wikis, social networking sites, and mobile communication technologies. To address concerns about online solicitation, bullying, and excessive burden to

commonplace in US public schools. However, these policies are often more like "unacceptable-use" policies, focusing on how students shouldn't use mobile phones and the consequences for breaking the rules. These stringent guidelines leave little room or desire for innovation in teaching or learning. The technological landscape has changed

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at-risk youth, these environments could be limited to only those affiliated with a particular school or school district—in much the same way Facebook was initially limited to Harvard students—and moderated by educators.

Again, this design concept prompts us to wonder what might happen as a result of such a system's implementation. Would the new environments be virtual "ghost towns" like so many corporate intranet communities, or would students engage in this new sandbox? Does critical mass take on different meaning when most of your social network is in one organization? Would students reject systems limited to only their schools? These online environments could transition from risk-laden enterprises to safe places for experimentation and learning. These systems might even destroy data when students graduate to protect their reputations.

These concepts can be a starting point for thinking about appropriate mobile-technology design in school environments.

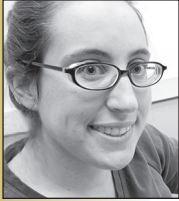
Mobile phone bans have been in schools for more than two decades, and local control and acceptable-use policies are becoming

dramatically, and researchers have begun to demonstrate benefits to learning through these novel technological solutions.^{4,5} The next step toward a truly connected youth is bridging the gap between in-school and out-of-school technology use, both in policy and practice.

Relevant stakeholders must ensure that school guidelines are flexible enough to protect students and faculty while supporting innovative practices. Whereas the contracts must retain their legal base, schools can benefit from exploring possible additions that outline practices that aren't just acceptable but encouraged in the school environment. For example, policies could let students engage with mobile phone services and social media to manage the school day and organize homework, tests, and activities. In addition, policies could let teachers exercise discretion when experimenting with mobile devices in lesson plans. Mobile phones' potential in schools lies in their features and services that can be leveraged for not only socializing and play but also learning objectives. Policies should remind students and parents of the ongoing negotiation between the desire to use technologies and school objectives, as well as perceived versus actual risks.

The future depends on educators, designers, and researchers working

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together to build adaptable systems and construct usage policies that make sense in formal learning environments. Technologists, policymakers, and researchers must all understand formal schooling's unique environment and how pervasive technology practices are being carried out there—not just in students' afterschool and home life, on which most research currently focuses. To predict how students will be workers in the future, we must learn how they're using technology for their work today. ■

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