EMERGING TECHNOLOGY TRENDS AND ETHICAL PRACTICES FOR THE SCHOOL PRINCIPAL

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ABSTRACT
What is the school principal’s role in ensuring ethical technology use while promoting the use of wireless and advanced technologies in instruction? The rapid advances in technology in only the past 5 years, including the increase in laptops and smart phones, have transformed both educational practices and the role of the school principal as technology leader. In this research analysis, social, legal, and moral issues have emerged as three major concerns. Principals must advocate for equity and access to new technologies in their schools, with an awareness of student diversity in race, language, special needs, and gender. By closing the “digital divide” gap, promoting safe internet use policies, adhering to copyright laws, and ensuring environmentally sound procedures, the educational leader can meet the challenges of emerging technology use.

INTRODUCTION
As schools begin to enter the second decade of the new millennium, there are great promises for the transformation of learning through the use of new technology tools, such as wireless multimedia devices. Globally, the Internet has become more readily accessible and teachers are integrating associated technologies, such as wireless laptops, smart phones, and iPods, in their instructional practices.

Educational administrators have been on the forefront of these changes, but they now have the immense task of leading schools during an economic recession.
They are faced with the demands of allocating limited resources for both new technology purchasing and the ongoing high stakes testing of national and state standards initiatives. School leaders have additional responsibilities to promote safe Internet use policies, protect student privacy, adhere to copyright laws, and establish student health and environmentally sound policies.

THE DIGITAL DIVIDE

Despite the global increase of wireless devices for Internet access and new teaching methods, equity and access to these recent technologies are recurrent themes in schools. Research suggests that there is a digital divide in the U.S. public education arena, caused by socio-economic, ethnic, racial, language, and gender factors. The principal has a duty to become an informed activist in promoting access to technology by all students and teachers.

In the author’s previous study of New Hampshire high schools, contrasting a property poor, “low tech” school with a property rich, “high tech” school, it was found that rural and urban schools in low socio-economic areas are more likely to lack sufficient computers and Internet access. In those same schools, students had low achievement levels on standardized tests and teachers used the few computers they did have for minimal skills such as drill and practice. In the high performing, property rich, suburban schools, by contrast, teachers used more advanced computers for Internet use in research projects and in problem-solving activities (Garland & Wotton, 2001-2002).

Similarly, Creighton (2003) found that, “In Maryland, the number of schools reporting that their students regularly use technology to gather information from such sources as the Internet decreases as the percentage of students receiving free and reduced-price lunch increases” (p. 13). In a study of Florida K-12 schools, Hohlfeld, Ritzhaupt, Barron, and Kemker (2008) found statistically significant disparities in levels of technology support between high and low socio-economic status schools. They conclude that there is a large digital divide in Florida’s public schools. Creighton (2003) further suggests that higher order technology use has decreased in low performing schools due to the provisions of the “No Child Left Behind Act,” which has put so much pressure on schools to raise standardized test scores through traditional “teaching to the test” practices of drill and practice.

In promoting technology access for all students, educational leaders must be aware of diversity issues, such as race, language, disability, and gender. Low socio-economic schools also have high minority enrollment. Picciano (2006) points out that, “Urban schools, schools in poor rural districts, and larger schools have less computer hardware per student than other schools; they also enroll much higher percentages of African American and Latino Children” (p. 52). English language learners and special needs populations may not be adequately served by the technology use prevalent in most schools. Many software programs and Internet search sites are inappropriate for children who struggle to learn English.
Immigrant language learners have the additional challenge of generally having to use English only programs. In a 6-year study, Ono and Zavodny (2008) found that immigrants and natives who live in Spanish-speaking households are less likely than people living in English-speaking homes to have access to information communications. In addition, Hlas, Schuh, and Alessi (2007-2008) used mixed methods analysis research in determining that online sites give non-native and native English speakers more equal class participation opportunities than in more traditional face-to-face classroom interactions. Reliance on technologies used for traditional students may pose additional problems for learning and otherwise disabled students. McKenzie (2007) found that learning-disabled students are socially and academically excluded from information communications. Other special needs learners are in need of assistive technologies that may be too expensive for some school district budgets. The availability of appropriate software and information technologies in the educational setting is thus invaluable for both English language and special needs learners.

Another factor associated with inequities in technology use is that of gender. A British study found that “cyber girls” (2006) are more likely to use cell phones that connect to the Internet than their male peers. Picciano (2006) stated that more than half of all Internet users in the United States are female. Despite the recent trends of girls’ increased use of Internet handhelds, females are still less likely to take academic computing courses. Creighton (2003) stated that only 15% of the students who took the Advanced Placement computer science exam were girls. In addition, he found that women received less than one-fourth of undergraduate computer science degrees, compared with more than a third over a decade earlier. Cady and Terrell (2007-2008), in a study of 5th-grade girls in a science class, found that teachers’ support of technology use by females in the early grades led to more self-efficacy toward their future use of computers. In order to include more girls in educational technology, Cady and Terrell (2007-2008) and Picciano (2006) advocate the full integration of technology in the content of all courses, with an expansion beyond the mathematics and science curricula. School principals might also consider advocating the inclusion of smart phones, more prominently used by girls, as instructional tools in writing (texting) or research (Internet searching) assignments.

Race and gender issues converge in a technology use study conducted by Jackson, Zhao, Kolenic, Fitzgerald, Harold, and Von Eye (2008) of 515 children, comprised of 172 African Americans and 343 Caucasian Americans. They found that, “African American males were the least intense users of computers and the Internet, and African American females were the most intense users of the Internet. Males, regardless of race, were the most intense videogame players, and females, regardless of race, were the most intense cell phone users. . . . Length of time using computers and the Internet was a positive predictor of academic performance, whereas amount of time spent playing videogames was a negative predictor” (p. 437). The researchers suggest that information technology,
especially computers and the Internet, needs to be introduced by educators in the early grades for African-American males.

Unless the educational leader is a successful activist on behalf of disadvantaged students, there will be fewer opportunities for higher uses of technology in poorer urban and rural districts. School principals need to be aware of the ways that emerging technologies can best serve the needs of diverse student populations, taking into account factors of poverty, race, language, disability, and gender.

LEGAL ISSUES IN EMERGING TECHNOLOGIES

Legal issues have risen because schools across the nation have been purchasing more laptop computers and smart phones as teaching tools. As these multimedia devices enhance Internet access, educational leaders are adopting new policies. The principal has a key role in identifying illegal practices and establishing guidelines for acceptable Internet use by teachers and students. One research focus of this article is on the appropriate use of cell phones, especially those with texting and photographic capabilities. Two other areas of legal importance are those of promoting online safety for students and enforcing copyright laws.

Cell Phone Policies

Many schools, like individual cell phone users, are “trading up” to smart phones, which offer Internet, e-mail, texting, music, video, and touch screens. According to Alexander (2008), smart phones account for 90% of the tremendous growth in cell phone users during 2008. Some schools are using them as less expensive laptop alternatives because of their ease of use and Internet and texting capabilities. But the enhanced video and camera features of the newer cell phones raise privacy concerns for school principals.

Garland (2006) suggested that school districts have cell phone use policies in place and that principals pay closer attention to the privacy issues with the newer video streaming, photographic, and texting enhanced handhelds. In a national study of 200 principals, Obringer and Coffey (2007) determined that most schools had cell phone policies in place that were generally supported by parents. However, these researchers noted that smart phones enable students to more easily cheat on exams by taking photographs or through text messaging. In addition, “An especially egregious problem is the use of camera phones to take embarrassing photographs of classmates in private areas (e.g., restrooms or locker rooms) and share them with others electronically. This technology raises legal issues of privacy, sexual harassment, and theft of proprietary information” (p. 41) While cell phones may be valuable during after school events or emergencies, Obringer and Coffey (2007) recommend that schools develop new policies to prohibit the student use of camera phones, especially in locker rooms.
Online Safety

Concerned with the rise in Internet safety issues, the National Association of Secondary School Principals (NASSP) adopted a policy statement, which addresses a “triple challenge” from the Internet, “protecting students from online predators; respecting their First Amendment rights; and encouraging them to use the Internet for learning” (Bradley, 2008, p. 4). The NASSP urges principals to review all social networking sites, protect students from cyberbullying, educate teachers and students on the legalities of Internet use, and promote instructional uses of the Internet.

In 2001, the “Children’s Internet Protection Act” went into effect, requiring school districts to disseminate a federally mandated Internet safety policy to prevent children under age 18 from accessing inappropriate material on the web (Levine, 2001). Seven years after that law was established, the popular social networking site MySpace and the nation’s state attorneys general set up a further agreement to keep young people from sexual predators. According to Bradley, “MySpace agreed to take a number of steps to protect children, including allowing parents to provide e-mail addresses that would allow MySpace to block anyone with those addresses from setting up profiles, and creating a closed ‘high school’ section for users under 18” (Bradley, 2008, p. 4). School principals should have additional Internet use policies in place at the building level.

The American School Board Journal has specific recommendations for securing school websites as well as for teaching students safe online practices. One product recommended by the American School Board Journal in 2007 for Internet safety and security is DerbyTech, which is a network security device that provides web usage reporting, virus and anti-spam protection, filtering, and spy-ware blocking (School Safety and Security, 2007). The journal’s specific recommendations in 2006 for educators and parents in teaching young people online safety include ways to protect privacy by providing limited personal information and care in adding strangers to instant messaging and friend lists (Safe Socializing Online, 2006).

Many districts have also rewritten their bullying policies to include their online equivalents, the “cyberbullies.” A 2007 National Crime Prevention Council survey found that over half of all high schoolers reported being the victims of cyberbullying (Dillon, 2008). School district leaders are encouraged by Dillon, a senior editor of the American School Board Journal, to not only have cyberbullying policies in place, but also to “Find ways to harness the educational value of social networking. Some schools and educators are experimenting successfully with chat rooms, instant messaging, blogs, wikis, and more for after-school homework help, review sessions, and collaborative projects, for example” (Dillon, 2008, p. 16). Principals should thus become aware of popular social networking sites, protect students from predators and bullies, and encourage educational uses of these new uses of the web.
There are other legal challenges posed by the new technologies. Some students who have inappropriately used the video-sharing website YouTube have unsuccessfully challenged first Amendment free speech rights. Educational law attorney Darden reported that a student who secretly videotaped his teacher and posted the footage, accompanied by the song “Ms. New Booty,” on YouTube received a 40-day suspension from school. The student claimed the suspension was a violation of his First Amendment free speech rights, since the posting of the video occurred off campus. . . . But the federal district court for the state of Washington declared in a 2007 ruling that the student violated the school policy on sexual harassment and disregarded rules forbidding electronic devices in school” (Darden, 2008, p. 51). If school principals have firm Internet use policies in place, they are less likely to be test cases for legal challenges.

Copyright and the Internet

School principals have a legal responsibility to ensure that teachers and students adhere to copyright laws, including those that relate to emerging technologies. Specifically, educational leaders need to enforce Fair Use of the Copyright Act in order to avoid copyright infringement. However, this is a challenge due to the increase in the socially accepted practices of uploading and downloading of creative works without permission. Because the proliferation of wireless devices allows easy access to the Internet and social networking sites, students frequently and perhaps innocently engage in online theft by taking copyrighted images and music through search engines such as Google and post them to their Facebook or MySpace web pages.

According to Baker (2008), the copyright law allows teachers to use some material for educational purposes as long as the copies are not used for profit or public distribution. This means that students who use copyrighted graphics, text, images, and music from the web in their multimedia projects may only use them in face-to-face classroom activities at the building level. Baker (2008) asserts that written consent from the owner of copied material must be obtained before student work can be displayed in the school district, on the web (even classroom websites), or in state level competitions.

Some educational researchers and other writers urge the decriminalizing of online theft, believing that schools could more loosely interpret copyright laws affecting fileshearing or copying of web-based material. Ross believes that it is more important to educate students and consumers on the legitimacy of the current laws, “The market is providing legal alternatives, driven by our property rights system that gives creators power over the production and distribution of their works” (Ross, 2008, p. 14). On the other hand, Lessig, author of Free Culture and Remix, states that the current copyright law is too extreme, “And schools across the nation have adopted strict policies to block activity that the Supreme Court in 2005 declared presumptively illegal . . . its rendering
a generation criminal. A concerted campaign by rights holders, politicians, school administrators, and increasingly parents has convinced kids that their behavior violates the law” (Lessig, 2008, p. 15). At the crux of this debate is the school principal.

On the one hand, copyright infringement is an illegal practice that is increasingly being prosecuted. Natividad (2008, p. 501) states, “Copyright holders, largely through industry associations, are increasingly investigating and prosecuting direct infringers with the goal of changing social norms regarding copyright infringement.” Some copyright holders are joining with industry associations to build cases against individual infringers, such as students, and turning over the evidence to law enforcement agencies.

On the other hand, some school technology directors are advocating a more lenient policy, forgoing any responsibility for enforcing copyright laws in the school. Johnson, a Minnesota school district media and technology director, believes that is the sole duty of the principal to determine fair use of copyrighted materials, “I will acknowledge that the enforcement of all laws and policies is an administrative responsibility, not mine. Quite honestly, if building principals choose not to learn about copyright, about how materials are being used in his or her building, or about whether district policies are being broken, it is not the LMSs [sic Library Media Specialist’s] job to make him. They’re the ones getting paid the big bucks. Let them earn them. I will [sic will] rat out my fellow teachers only under a very narrow set of circumstances” (Johnson, 2008, p. 98). As an alternative to strict adherence to copyright laws, Johnson urges teachers to ask students to assign a Creative Commons (CC) designation to work they create.

Given the increase in both copyright infringement and prosecution of such illegal acts relating to web-based materials, the school principal would be wise to inform teachers and students of the more strict interpretation of copyright laws in order to avoid possible criminal and civil enforcement actions. School districts should have clear copyright policies in place, which can inform administrators, library media specialists, teachers, and students.

**MORAL CONCERNS IN TECHNOLOGY PRACTICES IN SCHOOLS**

In this final section on the ethical challenges posed by emerging technologies, the issues of student health and environmentally sound policies will be addressed. Principals are leaders of school facilities in which unhealthy and unsafe practices may contribute to problems in children’s health and electronic waste.

As more schools are using smart phones and laptops for administrative and instructional purposes, school leaders must be aware of possible health hazards of these wireless devices. Some recent medical studies warn of the risk of cancer and brain tumors from use of cell phones. Last year, the University of Pittsburgh Cancer Center Institute “warned school employees to limit their cell-phone use
based on early unpublished data from scientific studies" (Yarrow, 2008, p. 11). Yarrow cites the American Cancer Society’s position that there needs to be further study of long-term exposure of cell phones on children, “because the latency period for brain tumors can be 10 to 15 years” (Yarrow, 2008, p. 11). In early 2009, Consumer Reports reiterated this warning, informing consumers that “A Swedish team of scientists found that the chance of developing a malignant brain tumor doubled in some people who used cell phones for 10 or more years . . .” (2009, p. 12). Educational administrators might heed the advice of some scientists, who urge people to minimize the risk associated with cell phone use by wearing wired earpieces. Hands-free cell phone use would also reduce the risk of repetitive strain injuries, newly termed the “BlackBerry thumb” ailment by Consumer Reports (2009).

Laptops pose additional health hazards to students and school personnel. Bodies can be strained, especially the eyes, due to ergonomically incorrect use of laptops. Wardyga states, “Most of us spend an increasing amount of time in front of our computers, which has led to certain problems—most notably eye strain and fatigue. What causes these problems is a reduced rate of blinking; the result is dry eyes, fatigue and strain. These complaints are often associated with headaches and arm and neck discomfort” (2007, p. 12). In a research presentation at the Ergonomics Society Annual Conference, Crompton (2007) found that more than half of student respondents experienced aches and pains with laptop use because of poor posture. More seriously, in 2008 Sony recalled 440,000 Vaio laptops due to overheating which caused burns to some users (Lewis, 2008). Principals could address these issues in laptop use by adopting policies on keeping laptop monitors at appropriate distances, ensuring that students take half-hour breaks, and monitoring safety hazards in computers which overheat.

General environmental safety is an issue with schools’ electronic trash disposal. Technology hardware is filled with toxins and must be dismantled in an ecologically sound manner. According to Motavalli (2007), flame-retardants used in the plastic housing of computers, FAX machines, printers, and circuit boards are highly toxic in “Taizhou, China, where much of the digital detritus from our computerized society ends up. Instead of eco-correct dismantling, you’ll see workers exposed to myriad toxins as they bang computers apart with primitive hammers. This is the dark side of Being Digital . . .” (p. 59). With millions of computers becoming obsolete in schools across the nation, principals have a duty to practice more environmentally appropriate technology waste removal.

CONCLUSION

The school principal must make certain that her or his school is an equal opportunity technology environment for every learner, including both genders,
### Table 1. Garland Survey on the School Principal’s Ethical Uses of Technology

Directions: Please respond to each statement by circling a number from 1 to 5:

1 = strongly agree  
2 = agree  
3 = neutral  
4 = disagree  
5 = strongly disagree

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<th>Statement</th>
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<th>N</th>
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<tr>
<td>1. Our school provides equal access to technology for all students.</td>
<td>1</td>
<td>2</td>
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<td>2. Our school provides appropriate access to technology resources and training for all teachers and professional staff members.</td>
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<td>3. Our school has a technology “acceptable use” Internet policy which is clearly communicated and implemented for:</td>
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<tr>
<td>A. All Students</td>
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<td>2</td>
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<tr>
<td>B. All Teachers</td>
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<td>C. All Support Personnel</td>
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<td>D. All Office Staff</td>
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<tr>
<td>4. All professional staff members in my school promote and enforce “online safety” for students.</td>
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<td>5. We provide students with an understanding of the ethical uses of technology, including issues such as inappropriate websites and plagiarism.</td>
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<td>2</td>
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<td>6. Our school promotes “environmentally safe” technology practices, such as recycling and conserving paper.</td>
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<td>7. We have policies that enforce copyright laws associated with technology use of intellectual property.</td>
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<td>2</td>
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<td>8. We often update our cell phone and laptop use policies.</td>
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<td>2</td>
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<td>5</td>
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all races, and special populations. In order to significantly narrow the digital divide, technology use should be integrated into the entire curriculum at all grade levels.

We are a worldwide data communications society. Nearly 160 million people in the United States alone use wireless devices (Picciano, 2006). As schools adopt these technologies for educational purposes, principals must plan carefully in preparing students for the digital society that exists already and is dramatically changing the future. Educational leaders can best adapt to these advances by using their limited resources in ways to ensure that all students have access to updated, safe, and academically appropriate technologies.

A self-study questionnaire on the principal’s current practices in ethical and legal uses of technology is a practical addendum to this research analysis (see Table 1). In an age of budget cutbacks, school principals must plan wisely to allocate scarce resources for educational change. The ongoing challenge for educational leaders is to support the use emerging technologies for the benefit of all learners.

REFERENCES


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