Transforming Learning With Technology

Dr. Tammy Stephens

Dr. Stephens is a national expert in educational technology who has worked with many school districts across the country over the last 22 years. She earned a doctorate in learning technologies from Pepperdine University in Malibu, California. Dr. Stephens is committed to helping educational organizations improve instruction and student outcomes by offering customized solutions that are engaging, relevant, standards-based, and focused on best practices for blended, hybrid, online, and one-to-one computing environments.

This paper demonstrates how increased access to technology can help districts like the Madison Metropolitan School District better engage students to improve learning outcomes, create new educational opportunities, and prepare them to enter tomorrow’s workforce.

Why Is Technology Important to Today’s Students?

Bridging the Gap

In addition to using technology to implement new education initiatives, greater access to technology in our schools is needed to bridge the gap between how students use technology in and out of school. Technology is pervasive in students’ personal lives, as demonstrated by the results of the Speak-Up Survey (Project Tomorrow, 2013) in which over 364,000 students participated:

- 68% of high school students primarily access the Internet through a 3G or 4G device
- 41% of students who have not taken a fully online course would like to take a virtual class, citing self-paced learning as the number one benefit
- 60% of students say technology-aided learning would be a good way for them to learn
- 33% of students in grades 6-8 would prefer to read a digital book in school
- 29% of students have used an online video to help them with their homework
- 30% of students believe being able to text their teacher would help them succeed
- 75% of K-2 students use computers and mobile devices to play educational games regularly
- 38% of students regularly use Facebook to collaborate with classmates on homework

School systems should mirror students’ access to technology outside of school, where “students are free to pursue their passions in their own way and at their own pace. The opportunities are limitless, borderless, and instantaneous” (US Department of Education, 2010). Providing on-demand access to technology will deliver more meaningful learning experiences that will prepare students for an increasingly digital workforce.

Teachers, administrators, and parents are also interested in using technology to improve student learning. The Speak-Up Survey (Project Tomorrow, 2013) shows that “teachers are increasingly interested in leveraging technology for activities with students and many are modifying their instructional plans to incorporate more digital experiences. Nearly a majority of classroom teachers (45%) noted that they were creating more interactive lessons because of having access to technology, an increase of 25% in just the past two years” (Project Tomorrow, 2013).
In addition, the Speak-Up Survey (Project Tomorrow, 2013) showed that administrators also believe in the power of technology to enhance learning and use technology in their roles:

- 50% think leveraging digital textbooks, online classes, and mobile devices could improve student outcomes
- 79% text colleagues, 69% watch online videos for professional growth, and 32% use tablets for classroom observations

Parents surveyed by Project Tomorrow expressed the desire for teachers to communicate with them using technology on an ongoing basis. Indeed, “social media and digital tools and resources have transcended the classroom and are emerging strongly as key components of 21st century school to home communications” (2013).

Preparation for the Workplace

Students will also need strong technology skills so they can contribute to our nation’s economic growth and prosperity, which in turn will allow the United States to compete in the global economy.

The Madison Metropolitan School District is located in Dane County. According to a report published by the Progressive Policy Institute (Mandel, 2013), Dane County is among the strongest counties in the United States in terms of increasing jobs in IT and related sectors during the 5 years ending in 2012. Figure 2 depicts scores given to counties based on percentage increase of tech- and information-related jobs since 2007. However, unless the district consistently offers opportunities for technology-based learning, students will lack the relevant skills and knowledge that enable them to join this increasingly sophisticated workforce.

The Demand for Technology in New Education Initiatives

Education is in a time of unprecedented change. Schools must implement multiple initiatives such as the Common Core State Standards (CCSS) and Smarter Balanced Assessments and face greater accountability for preparing college, career, and community ready students. These changes are causing educational leaders to leverage technology to transform the delivery of education.

Students and staff need greater access to technology to meet the district’s strategic goals. Greater access to technology will enable teachers to empower all students through increased communication and collaboration with real-world audiences beyond the classroom. Technology such as digital content and real-time assessments can act as a catalyst for students to be more productive and to improve their communication and collaboration skills. Technology can also make personalized learning environments powered by rich digital learning tools possible as well as provide real-time learning analytics needed for continuous improvement. Additionally, parents can leverage technology to view student progress and communicate with teachers.

How Can Technology Improve Learning?

Communicate and Collaborate

Today’s students use digital media in different ways than students of previous generations. They prefer to use web applications that provide interactive technologies in all aspects of their life, including learning (Heart, 2008). More importantly, they can accelerate their learning through knowledge exchange and collaboration (The Metiri Group, 2009). One finding of Project Red (Greaves, Hayes, Wilson, Gieleniaik, & Peterson, 2012) is that school districts that experience the most success in improving student achievement with technology have students interact with technology daily.
Part of being college, career, and community ready requires students to communicate effectively to various audiences using different mediums, including technology. Students graduating from high school need the ability to collaborate with people they have never met over the Internet using digital citizenship skills. The CCSS require students to use collaborative tools such as blogs and wikis to communicate with real-world audiences. These standards mirror how professionals routinely use the Web and tools such as wikis, blogs, and digital content for research, collaboration, and communication in their jobs.

Assess Progress in Real Time

Technology creates new opportunities for delivering formative assessment results and learning analytics to students, teachers, administrators, and parents in real time. Access to real-time assessment data enables teachers to offer personalized, differentiated learning opportunities to students. When combined with learning systems, technology-based assessments can be used to diagnose and modify the conditions of learning and instructional practices while determining what students have learned for grading and accountability purposes. Both uses are important, but the former can improve student learning in real time (Black & William, 1998). Furthermore, systems can be designed to capture students’ inputs and collect evidence of their knowledge and problem-solving abilities as they work. Over time, the system “learns” more about students’ abilities and can provide increasingly appropriate support (US Department of Education, 2010). With these assessments in place, educators can collect and use data on student learning to continually improve learning outcomes and productivity. In addition, technology-based communication can strengthen the parent-teacher relationship by simplifying the transfer of information, such as through online gradebooks and e-mails. As a result, parents become informed about what is going on in the classroom and can more effectively support their child’s academic achievement.

Engage and Personalize Learning

Combining both audio and visual learning tools in the classroom has increased student engagement because it adds variety to the learning environment. Every day, more digital resources that involve media and interactivity, still and moving images, audio, and applications that run on a variety of devices become available. These resources are more engaging than traditional textbooks. Powerful technology systems such as learning management systems make it possible for students to use resources personalized to their individual needs that boost their learning. Additionally, communication technologies such as blogs and discussion boards help students create distributed learning environments.

Connect to the CCSS and Real-World Learning

Technology makes it possible to put powerful creative tools in the hands of students. The CCSS require students to do much more than passively memorize facts and answer questions on traditional tests. Instead, the CCSS emphasize inventive thinking, effective communication, high productivity, and digital-age literacy to create innovative solutions to real-world problems. Students are expected to use technology to efficiently locate, analyze, synthesize, and evaluate information and then communicate and demonstrate understanding of concepts. They are also expected to engage in the real work of mathematicians, scientists, composers, filmmakers, authors, and engineers. Students need powerful 21st century learning tools and uninterrupted Internet access to make this kind of learning possible.

What Is the Best Way to Implement Technology to Achieve These Results?

Access for Every Student and Educator

To realize the potential of technology for student learning, educators must integrate it into the curriculum and all learning experiences. Mobile technologies make learning opportunities available on demand throughout our society. Access to an infrastructure of learning that is always on enables students to create and share multimedia content, access resources, and collaborate in online learning communities when and where they need, regardless of their location or time of day.

Limitations of Shared Resources

In the past, many school districts have implemented shared computer carts. These carts were often shared between classrooms to provide technology access for students. This approach requires scheduling learning
around access to technology instead of embedding it as a tool students can use to support learning and assessment throughout the day as needed. Although this limited access to computers helps students gain technical skills, it falls far short of acting as a personal device that is available when and where students need it to support learning. The ideal access to support learning is a device for every student that does not need to be shared between classrooms.

**Conclusion**

One goal of the National Education Technology Plan (2010) is to ensure that every student and educator has at least one Internet access device and appropriate software and resources for research, communication, multimedia content creation, and collaboration for use in and out of school. While shared computer carts help students gain technology skills, the district cannot truly meet the goals of the CCSS and create college, career, and community ready students without providing continuous access to an Internet-enabled device for every student.

We can only achieve the kind of engagement, student-centered learning, and real-time data and information needed to transform our school system by providing seamless universal access for every child. Students with ready access to technology evolve from passive to active learners who take on more responsibility, act as experts, and become more engaged in their own learning. In addition, technology opens up new assessment and evaluation opportunities that were formerly unavailable in education. By coupling powerful technologies such as learning management systems and data-warehouses with rich digital resources, we can truly personalize learning, differentiate instruction, and ultimately, improve outcomes in ways that were previously impossible.

**Bibliography**


~ National Technology Plan (2010)