New Technologies in the Classroom

By Jodi Pilgrim, Christie Bledsoe, and Susan Reily

The authors of this position paper describe the current and potential uses of new technologies in the classroom. Mobile, wireless devices such as global positioning systems, tablets, and cell phones are changing instruction and learning. Many of these tools provide constant access to Internet resources, which allows extensive communication and collaboration. The authors share ways educators can utilize new technologies such as the iPod and iPad.

"If we teach today's students as we taught yesterday's, we rob them of tomorrow."
John Dewey (1944, p. 167)

New technologies are changing the way educators think about education and literacy. The U.S. Department of Education has provided a national educational technology plan (2010), titled *Transforming American Education: Learning Powered by Technology*. The authors of this plan recommend applying the advanced technologies for personal and professional use to instruction and pedagogy to improve student learning. Although schools and universities are investing in technologies such as the iPad tablet, educators are struggling to keep pace with the speed of technological development and demand (Samuels & Farstrup, 2011). Many students have access to technologies at home or at school, especially in the form of mobile technology. Educators can utilize this technology so that academic learning translates to real-world applications. Students can keep an agenda on their phones or iPods, read books on their smart phones, and utilize mobile resources such as a dictionary, calculator, or camera. Students can use phones or other technology to take pictures of the classroom agenda or the teacher's notes on the board.

Although the technology is readily available, teachers may not be successfully integrating technology into classroom practices. We encourage educators to integrate new technologies into classroom instruction by providing opportunities for students to utilize technology. We present an overview of educational transformations taking place and describe innovative ways to integrate new technologies, specifically the iPod and iPad.

Literacy

Digital literacies were labeled *hot topics* for reading education in 2010 (Cassidy & Cassidy, 2009). Biancarosa and Snow (2006) reported, "Literacy demands have increased and changed as the technological capabilities of our society have expanded and been made widely available; concomitantly, the need for flexible, self-regulated individuals who can respond to rapidly changing contexts has also increased" (p. 9). In addition, communication

is increasingly digital, with multimodal, multimedia technologies, screen-based interfaces, and expanding networks (Kress, 2000). Jobs require professionals to use the Web and tools such as wikis, blogs, and digital content for research, collaboration, and communication.

Using these real-world tools in elementary and secondary classrooms creates learning opportunities that prepare students to be more productive members of a globally competitive workforce (U.S. Department of Education, 2010). In its new technology plan, the U.S. Department of Education (2010) recommended that the nation's schools "design, implement, and evaluate technology-powered programs and interventions to ensure that students progress through our K-16 education system and emerge prepared for the workplace and citizenship" (p. 12). Varied digital technologies provide teachers of any content area with a different approach to integrating the skills of the 21st century.

New Technologies Improve Mobility and Access

Laptops are small enough and portable enough to be common classroom tools, and many teachers are able to provide student access to these computers through labs or centers. However, technologies such as iPads and iPods offer even more mobility. These screen-based technologies are becoming commonplace in elementary and secondary classrooms. The iPad is a small, hand-held computer with a flat touch-screen that serves as a personal computer with wireless access to the Internet. Its mobility allows students to engage in academic activities during times that might otherwise be wasted. More than 1,000 one-to-one projects exist in the United States that involve Apple devices and in which each student has access to a laptop or iPad (Apple Events, 2012). Although these devices are becoming more accessible, there is still much to learn about the many uses of these technologies to improve instruction and learning.

The iPad has the portability of a personal phone that can be customized by the user. This portable device has a touch screen, lacks a physical keyboard and a USB, and has the multitasking ability needed for serious computing. The iPod is a smaller, hand-held device with similar capabilities. Users of the iPad and iPod can download applications, or *apps*, for immediate use. An app is similar to a mini-software program that does not have to boot and provides information in seconds. Many apps are available for free or for a small fee. Adults utilize apps that range from weather alerts to restaurant recommendations or health tips. One can also download an app that traces a walking path and provides mileage information through global positioning system (GPS) technologies. Hundreds of thousands of apps are available for Apple customers, and many could be beneficial for educators.

Tablet technology has entered the classroom through devices such as the iPad. Instead of opening a bound textbook for class, students access digital textbooks and resources that contain interactive media and provide immediate feedback. The content is the same as a textbook, but the layout and pictures go beyond static images. Colorful, interactive diagrams, photos, and videos fill the screen. Students can explore and manipulate a 3-D picture of the human brain or enlarge text and photos. The tablet allows students to highlight text, take notes, and navigate through text by sliding a finger along the bottom of the screen. These intuitive, interactive features are appealing to students.

In January 2012, Apple released the *iBooks 2* app for digital textbooks. One advantage of a digital textbook is that it can be updated quickly with little expense as new information is revealed. Publishers can modify e-texts after they have been distributed to students. For example, publishers can update textbooks with current findings—such as

to show that Pluto is no longer considered a planet. The touch screen is another feature that engages students by allowing them to select words or concepts and view a pop-up window with information that would traditionally be found in a glossary. Major textbook publishers—including Pearson, McGraw-Hill, and Houghton Mifflin Harcourt—have already committed to produce e-text versions of textbooks. However, classroom teachers can customize and design their own resources using the *iBooks Author* app (Apple Events, 2012).

Ultimately, students in schools could access all their books on a single iPad, eliminating the need for lockers and backpacks. However, this is not the only use for this portable technology. Since Apple's release of the first iPad in 2010, consumers across the nation have integrated this and similar technologies such as the iPhone and the iPod into their daily lives. Families use technology to plan, communicate, and entertain in the home setting. Use of iPads in the classroom will not only foster the interest of students but also digitize print. Literacy teachers need to know how to transform print-based practices that have dominated schooling into digital practices that reflect authentic uses of literacy beyond the classroom (Mills & Levido, 2012). In the next section, we expand on ways teachers can integrate iPads or iPods into their classroom practices. URLs for Apple apps are provided in the Appendix.

Communication and Collaboration

The iPad can be used as a mobile computer to access the Internet. Improved access and mobility provide the opportunity for wireless communication. Several platforms exist, such as *Epsilen* (http://corp.epsilen.com), that include secure sites for e-mail among students and teachers. Students can submit assignments via e-mail to the teacher, but students can communicate with one another as well. Nonacademic purposes exist as students have already explored high-tech note-passing, but there are many opportunities to promote collaboration for educational purposes.

Brindley, Walti, and Blaschke (2009) defined collaborative learning as a process in which students develop higher-order thinking skills by creating an environment where knowledge is shared among learners in an effort to achieve common learning goals. Online collaborations provide opportunities for both teachers and students to interact. Individual students can collaborate on the same project using the Web-based *Googledocs* (docs.google.com). All changes by any contributor are saved in live time, and saving

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multiple versions of the same draft is not necessary. A wiki is another platform for electronic collaboration. Whitney and Smallbone (2011) found that collaborative efforts produce greater learning opportunities for students. In combination with face-to-face meetings, wikis can enhance teaching and learning through instructional collaboration. According to Woo, Chu, Ho, and Li (2011), the wiki platform has shown to improve communication between genders and empower those typically too shy to participate in a regular class setting. This type of electronic collaboration certainly prepares graduates for the workplace, as employers desire applicants with strong communication and collaboration skills.

Apps can serve as portable interactive whiteboards. *ShowMe, Educreations Interactive Whiteboard,* and *ScreenChomp* are free downloads that record pen strokes and audio simultaneously. Then the user can post the recording online for others to access. These features can be used in any content area but are especially helpful in recording math problems with audio instructions. Students can also record their own audio or video clips to demonstrate understanding.

In one Texas school with a one-to-one iPad initiative, teachers were able to extend communication with parents by conducting face-to face videoconferences via *Facetime,* which is a standard function of the iPad 2. Both users need a Facetime account and an Internet connection to participate in a videoconference. Facetime can also provide a venue for guest speakers, interviews, and peer discussions.

Resources for the Classroom

Many apps can be used daily by teachers as management tools. For example, students can utilize a calendar, a calculator, and notes. These apps, already used by many students, need to be accepted by teachers. As a built-in application on the iPad, *Calendar* is a useful tool to organize activities both inside and outside the classroom and can help students develop organizational skills. The basic visual layout is similar to a daily planner, so the transition from hard copy to digital is relatively easy. Teachers can add events, such as tests, to the students' calendars. The iPad calculator apps are also very useful tools for students. The free apps include basic four function calculators, scientific calculators, and limited-function graphing calculators. The interfaces are very user-friendly with a keypad. The *Notes* app is a note-taking tool. According to Bannister (2010), "Lists or paragraphs can be emailed directly within the application . . . Students could use this application to take class notes, collect field notes, and author creative writing assignments" (p. 3).

The dictionary is another essential classroom tool. Dictionary apps such as *dictionary.com* allow users to search words and receive definitions. In addition to the search feature, these apps keep a history log and allow the user to review previously selected words. As the user types the word, a list of words starting with similar spellings begins to appear. The user continues to type the word until the target word appears on the screen. When the target word appears, the user touches the word to see the definition. The digital dictionary has capabilities beyond the paper dictionary, for, along with the definition, the user will see a microphone symbol on the screen. Touching this symbol prompts the device to *read* the word aloud! The reader can hear how the word should be pronounced. Now, instead of using dictionaries when a definition is needed, readers can use this application when they come to a word they cannot pronounce. The dictionary thus becomes a resource that can be used in decoding.

Apps for English language arts and mathematics are available for basic, beginning skills and range to more advanced concepts related to the content area. English language

arts teachers and students age 8 or younger enjoy practicing early-reading skills such as concepts about print and basic sight words through the app *Smarty Pants Schools*. Students can practice writing and grammar skills while creating their own interactive story using writing apps such as *Story Builder*. Several apps allow teachers to download individual or series of books related to specific types of literature. With the growing number of English Language Learners, apps for language development, such as *Learn English with busuu.com*, are essential to supplementing the needs of those learning English as a second language.

Mathematics apps can also be customized to the instructional level of individual students. Apps such as *Math Series* focus on beginning concepts of math involving number sense and include a diagnostic game to determine the instructional level for each student. The difficulty level of the app increases as the student progresses in skills. Apps are also available for rote practice of basic skills using the concept of flashcards. Many different flashcard apps are available, but *Flash to Pass* is a math-flashcard app popular with teachers and parents. Mathematics apps are also available for more advanced concepts such as algebraic equations. Similar to a calculator, *iFactor* provides a way for students to plug in equations and learn the process of solving the problem. Apps in the core content area also allow opportunities for students to collaborate and compete against each other. Apps such as *Mathletics* require a Wi-Fi connection and provide opportunities for students to practice skills while competing against others connected to the *Mathletics* app.

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Science and history teachers often search for innovative ways to help students to understand the content. Whether students are discovering how the world works or learning the history of the world, many apps allow students virtual experiences in the absence of real-world experiences. *The Elements* and *GoSkyWatch* are two popular science-related apps. *GoSkyWatch* turns the iPad into a telescope that students point to the sky to start exploring the stars and planets. *The Elements* app provides students with an interactive exploration of the periodic table. Many history apps provide interactive exploration as well through such apps as *HistoryTools*, which lists major news events and allows students to add their own important historical events to the timeline. Because history is always changing, apps such as *HistoryTools* and *World Book* provide current events that may not be available in the currently adopted textbook. Other apps provide opportunities for students to learn about geography. *Stack the States* and *Stack the Countries* engage children with interactive ways to memorize states and countries, while *GeoWalk* includes amazing photos that capture the beauty of geographic sites around the world.

Content-specific apps are available for students of all ages. Often teachers can control parameters to specific skills or ability levels and monitor student progress. The engaging apps make drill and practice more fun for learners, and the immediate feedback is beneficial

for student learning. Many apps are free or have a free trial version. Some iPad apps can be used on iPhones and iPods as well.

Summary

Technology offers educators a way to engage students in learning that translates to real-world applications. Although it is difficult to keep pace with changing technologies, educators must work to integrate new technologies into classroom instruction. Integrating technology extends beyond the ability to use a projector and present via PowerPoint. Integrating technology into instruction means students are utilizing technology to enhance higher-level thinking skills and problem solving. We encourage teachers to explore new technologies and to investigate ways to use digital tools as a resource supporting classroom learning. The possibilities are endless!

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Appendix

iPad Apps for the Classroom

App	URL
ShowMe	http://itunes.apple.com/us/app/showme-interactive-whiteboard/id445066279?mt=8
Educreations Interactive Whiteboard	http://itunes.apple.com/us/app/educreations-interactive-whiteboard/id478617061?mt=8
ScreenChomp	http://itunes.apple.com/us/app/screenchomp/id442415881?mt=8
Facetime	http://www.apple.com/mac/facetime/
Dictionary.com	http://itunes.apple.com/us/app/dictionary.com-dictionary/id364740856?mt=8
Smarty Pants Schools	http://itunes.apple.com/us/app/smarty-pants-school/id403824279?mt=8
Story Builder	http://itunes.apple.com/us/app/storybuilder-for-ipad/id377631532?mt=8
Learn English with busuu.com	http://itunes.apple.com/us/app/learn-english-busuu.com!/id379968583?mt=8
Math Series	http://itunes.apple.com/us/app/math-series/id301019765?mt=8
Flash to Pass	http://itunes.apple.com/us/app/flashtopass-free-math-flash/id330482882?mt=8
iFactor	http://itunes.apple.com/us/app/ifactor-and-solve-quadratics/id374211001?mt=8
Mathletics	http://itunes.apple.com/us/app/live-mathletics/id299596224?mt=8
The Elements	http://itunes.apple.com/us/app/elements-visual-exploration/id364147847?mt=8
GoSkyWatch	http://itunes.apple.com/us/app/goskywatch-planetarium-for/id364209241?mt=8
HistoryTools	http://itunes.apple.com/us/app/historytools/id385522233?mt=8
World Book	http://itunes.apple.com/us/app/world-book-this-day-in-history/id364739528?mt=8
Stack the States	http://itunes.apple.com/us/app/stack-the-states/id381342267?mt=8
Stack the Countries	http://itunes.apple.com/us/app/stack-the-countries/id407838198?mt=8
GeoWalk	http://itunes.apple.com/us/app/geo-walk-hd-3d-world-fact-book/id379602269?mt=8