

Teachers have used computers in the classroom for years now with various levels of frustration and success. That picture is changing with the introduction of mobile devices that offer an exceptional opportunity to successfully combine years of teacher experience with technology. Schools and educators are embracing portable devices that can accomplish countless functions. Laptops and desktop computers should and will continue to be a part of the

educational environment, but their role is changing.

According to John Traxler, desktop computer learning “takes place in a bubble, and in dedicated times and places where the user has his or her back to the rest of the world for a substantial and probably premeditated episode,” while mobile devices such as iPads, Android tablets, and smart phones are different because they are “woven into all the times and places of students’ lives. . . . [M]obile devices are about people.”¹

Educators are quickly embracing the advantages of using mobile devices in

the classroom. “Tablet sales into K-12 [schools] exceeded 3.5 million units in 2012, a growth of 340 percent from 2011. Sales are expected to double again in 2013 to reach close to 7 million [worldwide],” David Millar, Future-source senior market analyst for classroom technologies, told *TabTimes*.²

This article explores the experiences of two academies, one elementary school, and a conference that have made iPads an integral part of their teaching and learning process. The authors of this article primarily focus on the iPad,

BY JONATHAN SUMNER and LORI FUTCHER

since it is the device used by the schools cited. However, Android and other platforms also provide viable solutions for consideration, and the concepts discussed here could easily apply to most mobile devices. In 2013, 558 educators received the “National Survey on Mobile Technology for K-12 Education,” sponsored by Amplify, a corporation that creates digital K-12 educational products and services for school and home use. Survey results revealed that adoption of Google’s Chromebook nearly doubled in 2013. Thirty-one percent of the respondents had adopted or planned to adopt Chromebook, compared to only 14 percent in 2012. The balance of the survey clearly indicated that 81 percent of respondents preferred the iPad, while 27.3 percent said they desired a mixed environment where students would use their own devices. In descending order, device preferences rated below 20 percent were iPod Touch, Android Tablet, Kindle Fire Tablet, eBook Reader, Barnes and Noble Nook, Google Nexus, Microsoft Surface, Intel Education Tablet, and Amplify Tablet.³

An iPad for Every Teacher

Throughout the course of his career, Jonathan Sumner, associate superintendent of education for the Georgia-Cumberland Conference in Calhoun, Georgia, and a coauthor of this article, has lamented the shortcomings in technology use in the classroom. When desktop computers first became available, he observed that utilizing technology as an effective teaching tool was a hit-and-miss proposition for many teachers, in part because they were unable to take equipment home regularly in order to achieve proficiency. Also, many teachers had difficulty finding time and identifying strategies for creatively integrating technology tools into their lesson plans. Once laptops became available, teachers’ technology use increased, but even then, the laptops were labeled corporate property and primarily used for administrative purposes. Further, users often had to struggle with the lack of technical support to keep the equipment functioning properly. Laptops were slow to start up and sometimes frustrating to use.

Traxler writes that, “All too often, the institutional provision of IT [information technology] has led to a narrow prescription of the hardware, peripherals, connectivity, operating systems, applications, and privileges that could be accessed by students and lecturers. In the era when the dominant technology was networked desktop PCs, this made sense, at least in terms of procurement, installation, support, staff development, and user training.” Traxler adds that when a device is mobile and personal, a paradigm shift in management is needed to free the user to fully interact with the functions and purpose of the device as it relates to personal and professional use.⁴

In a study for the United Kingdom’s National Association for Advisors in Computers and Education (NAACE), Paul Heinrich theorized that one reason teachers are so enthusiastic about using their iPads in teaching is that the device is immediately available all the time. Older technologies required careful planning. In addition, teachers voiced strongly positive opinions regarding the value of iPads for both learning and personal use.⁵

Deciding that the iPad was the next step in teaching and learning, and perhaps the missing link to truly integrating technology, Sumner and his colleagues, under the leadership of Cynthia Gettys, then superintendent of the Georgia-Cumberland Conference (GCC), and with the backing of the conference executive committee, arranged for every full-time educator in the conference (K-12) to receive an iPad for academic use. The vision was that once the iPad became a personal device (as opposed to the old model of technology as tenaciously guarded corporate property), the ease of using them would stimulate curiosity and encourage educators to become innovators who were willing to explore a wide range of teaching possibilities, and that the device would become an effective teaching and learning tool in each teacher’s educational toolbox.

During the summer of 2012, teachers were allocated \$829 to purchase a new

iPad and customize it to fit their needs. They were allowed to use accumulated professional funds toward any costs not covered by the subsidy. Most of the 220 educators spent between \$150 and \$350 of their professional funds to purchase cases, keyboards, and adapters. The conference retained ownership of the devices with a buyout plan amortizing the expense over three years. At the end of that time, the teachers would own the iPad. In this way, the conference facilitated the transformation of a corporate device into a personal device. The response from teachers was overwhelmingly positive.

“This is currently the best educational, professional, and communication tool that I have,” said Shanel Jenkins, a teacher at the Duluth Adventist Christian School in Duluth, Georgia.⁶

“I am very grateful for the investment in further improving our educational system by allowing us to have the iPads to be used as a very powerful tool in education,” added Patricia Muriel, a teacher at Georgia-Cumberland Academy in Calhoun, Georgia. “This is an exciting time in education, as the possibilities for reaching our kids in ways they respond to have grown exponentially.”⁷

In a follow-up survey via Survey Monkey, in which the authors e-mailed the 225 educators (which included administrative assistants and local hires) in the Georgia-Cumberland Conference, 98.1 percent of the 52 teachers who responded indicated that they agreed or strongly agreed that they appreciated being given an iPad to use in the classroom.

An iPad for Every Student

Phil Wilhelm, principal of Bass Memorial Academy in Lumberton, Mississippi, had been thinking about using iPads for a while, but his small boarding school could not afford to supply students with both iPads and textbooks, so he put the thought out of his mind. When textbook publishers started advertising available apps, Wilhelm, along with David Denton, then principal of Madison Academy in Madison, Tennessee, decided to replace most of their hardbound textbooks with digital iPad versions for every student.

“It was primarily a classroom experience reason,” explained Denton. “The laptops weren’t being used effectively in the classroom. They distracted the kids, were bulky, and had a lengthy start-up time. The iPads are more controllable and more usable.”⁸

School administrators and teachers have expressed disappointment with programs that provided students with laptops. “The plan didn’t work,” said D. J. McKenzie, IT director at Madison Academy. The computers had become nothing more than “big, heavy word processors” that students used mainly to type papers and browse the Web. “There were constant problems. Whenever students brought a laptop into the office for repair, they often had to wait a week or two while it was sent off to be fixed. Teachers basically stopped using them because they couldn’t count on them being available. . . . With the iPad, if they do bring it to me, usually it’s something I can fix in a couple minutes.”⁹

These schools have found replacing textbooks with iPads affordable. In the U.S., a one-year supply of traditional textbooks costs approximately \$300 per student. Leasing the iPads for \$200 a year (as Madison Academy is doing) means parents who budgeted for the standard amount have \$100 left to spend on e-textbooks and apps. A math textbook that would cost \$80 per student for a print edition costs only \$60 for a six-year license on the iPad—an average of \$10 per year. With the typical student needing about five textbooks, money is left in the budget for additional educational apps.¹⁰

Bass Memorial Academy leases iPads for three years with the option to buy them at an amortized price. The school plans the budget so that it can upgrade to new devices every three years. The academy retains ownership of the iPads and loads onto each device the apps needed for a particular grade level, which allows the apps to pass from student to student in succeeding years. Students are charged \$300 annually for the use of an iPad (with a new case each year), apps, and e-textbooks.

Of this amount, \$170 covers the cost of the lease. E-textbooks are typically either \$14.99 per year or \$50 for a five-year lease.¹¹ The first year is the most expensive, since it includes the cost of downloading apps, but after that, the savings make up for the initial expense. After completing the third year of the program (2013), Principal Wilhelm reported that the school had been able to stay within this budget.¹²

That first year with the iPads was also the most challenging, the administrators learned, particularly since both schools jumped in without giving teachers much time to get accustomed to the devices (a mistake each school regrets). Nevertheless, teachers and students (both of whom go through an orientation process each year) have expressed appreciation for the change.

“I’ve been teaching for 41 years and to do this program has been very, very exciting,” shared now-retired Madison Academy English teacher Pam Gatlinn in 2011. “I love it. You think if you’re older you’re not going to use it, but it’s so user friendly!”¹³

One unexpected challenge was the school’s inadequate bandwidth. “We thought we had a pretty robust wireless network,” said McKenzie, remembering the school’s connectivity problems that arose soon after iPads were introduced. “That was the first indication these things were actually being used.”

Yet the challenge of upgrading the network has been minor compared to the technical difficulties the schools avoided by purchasing reliable devices. “We’re not dealing with viruses or moving parts that are breaking,” McKenzie reported. “The worst we’ve had happen is when students crack a screen. Then we have to send it off for repairs. Other than that, it’s been a lot less maintenance than laptops.”¹⁴ Wilhelm also recommended, “Make sure you get good cases for the iPads. The screens are easily cracked.”¹⁵

Another benefit, from the administrator’s viewpoint, is that it is easier to control the content to which the students have access on an iPad than with a laptop. “On laptops, kids had games and videos,” observed Madison Academy’s former principal Denton. “They

can’t put anything on [the iPads]. We have much tighter control.”¹⁶

Wilhelm explained that if students try to download something onto the iPad, the device is programmed to shut down completely. Also, using the campus Internet filtering system, the school can control the times of day when students can access Facebook and the Internet. For example, the Internet is blocked (with the exception of certain approved sites) during the Sabbath hours.¹⁷

Even with these tight controls, Bass Memorial Academy has had some challenges with students using apps in unacceptable ways. “iPads and apps can be a distraction as well as . . . a help,” says Riley Skiwski, former resident assistant at the academy, explaining his frustration at observing students watching CNN instead of studying. One way the school has addressed this challenge is by deleting problem apps on individual students’ units. Some students have even had their Internet access blocked.¹⁸

Elementary students also benefit from the use of their own individual Internet-filtered iPads. At the Adventist school in Jellico, Tennessee, the board grappled with the cost of replacing the two desktop computers in each room. They decided, instead, to provide personal iPads for each of their 5th through 8th graders. Since the school was not charging parents for replacement textbooks, it increased tuition by \$15 a month to recoup the costs. Students graduating from the 8th grade are allowed to keep their iPads.

To ensure that the iPads aren’t misused, the school requires parents and students to sign usage-and-care agreements, which obligate parents to maintain the iPad and set user levels of control for purchasing apps and other accessories. At school, students use the iPads for designated purposes and at specific times set by their teacher. If a student is caught off-task, he or she will have iPad-use privileges revoked for two days. The school reserves the right to confiscate iPads at any time and keep them overnight to check for compliance with program rules, such as appropriate



Students enjoy using their mobile devices throughout the school day in a variety of locations.

apps, music, pictures, etc.

In the 2013-2014 academic year, the school altered its usage agreement. It now uses Apple Configurator through the iLuv charge/sync cart to exclusively control what apps are installed and what Internet Website URLs are allowed. According to multigrade teacher Martin Cunningham, there were just too many challenges with the more open approach for both home and school use. Limiting iPads strictly to educational applications does diminish some personal use, such as playing games at home. Parents are also given the option to bring an iPad to school for their son or daughter, provided the school is given full and exclusive rights to configure it. Parents no longer have the ability to install apps for their children at home. Thus, all iPads are identically configured and have the same restrictions.¹⁹

Jellico students have expressed satis-

faction with iPad use. In a 2012 survey conducted by a teacher on behalf of this article's authors, 14 out of the 15 of the school's students with iPads indicated that they liked having the device to use at school, and the 15th student said the iPad was helpful for homework "sometimes, but sometimes it messes up and doesn't work." The students particularly appreciated not having to wait to use a classroom computer and having apps that allowed them to draw and type. A Jellico 6th grader said, "[I can] look something up [quickly] and don't have to get up and find a computer that's available. Other advantages of having an iPad in the classroom are having apps that you can draw on, type on, and other things. Also, it's nice to be able to turn in assignments on the iPad instead of having to use paper."²⁰

Using iPads for Creative Learning

Imagine a group of students standing in front of the shadow of a telephone pole gazing at their trigonometry calculations. "How tall is that telephone pole?" asks one. Another muses, "I wish we knew if our calculations were correct." The teacher stands back and aims the iPad's trigonometry camera app at the pole, and to the delight of the students, confirms their calculations. As this illustration shows, the next stage of integrating technology into the classroom and beyond is well underway and is poised to be a game changer in teaching and learning.

In the short time that they have been using iPads in the classroom, these Adventist teachers have already discovered countless creative uses for them, including having the device serve as an interactive field guide, a camera to document student learning, high-tech flash cards, and an easy-to-access virtual whiteboard, as well as a convenient tool for research and note taking. By connecting the iPad wirelessly to the classroom whiteboard, they can readily share content from any resource.

"I have been using the iPad in my classroom for almost a year now," says Jellico multigrade teacher Shellie Dale, "and I am regularly finding new uses for it. My 'Planbook' is on the iPad, as well as numerous references, books, writing tools, and apps for all the subjects, including physical education, art, and music. With the iPad's size and all the different ways to customize the iPad, everything I need is compact and easy to access."²¹

"Sometimes a textbook is an easy way out," observed Andrew Jamieson, a religion teacher at Madison Academy, who uses the iPad for a variety of in-class activities ranging from thumbing through digital versions of the Scriptures to bringing Bible stories to life with iPad-created puppet shows. "The iPad makes you more creative."²²

Many types of learners can benefit from the flexible learning environment offered by the iPad. Faith Laughlin, an education professor at Southern Adventist University in Collegedale, Tennessee, says that the visual elements of the iPad can help those who are hear-

ing impaired, and the verbal components can assist those who are blind or have dyslexia. “In addition, developers continue to create apps for special-needs students,” says Laughlin. Thus, one tool can provide differentiated learning for a wide variety of needs.²³

TechTrends recently published an article by Barbara McLanahan and her colleagues describing how a pre-service teacher helped a 5th-grade boy with attention deficit hyperactivity disorder (ADHD) experience one year of growth in reading by heavily incorporating an iPad into classroom instruction. Several strategies were applied during the six weeks, including having the students record stories they read. The stories were then played back while the student followed the written text. Interestingly, the student began critiquing the reading and noting what changes needed to be made for future readings. The teacher noted that without the iPad, metacognition would have been a much slower process, and the child would have achieved minimal gains. The report also praises the facilitative role the iPad played in maintaining student focus through a wide variety of modalities such as touch.²⁴

Retired English teacher Pam Gatling was thrilled when one of her highly motivated students who had a severe fear of public speaking chose to do a required class presentation by creating a video on his iPad.²⁵ “[It was] a little bit easier because there was not a crowd in front of me,” noted the student.

Jellico math teacher Martin Cunningham uses the iPad to help students when they get stuck while working on their homework: “Previously I had been frustrated when a student called me at home because of the difficulty of explaining a math problem over the phone. This app, *Educreations*, allows me to write out the steps just like I would on a dry-erase board while I’m talking them through the problem just like they were in class. This video can be quickly made and sent to as many students as needed. This has been a huge asset to my math program.”²⁶

Too Much Too Young?¹

Standing in the library foyer, I watched as a young mother checked out the books she had selected. At her feet sat a toddler in his stroller, eyes glued to a mobile device as he eagerly tapped the screen. Never once did he look up.

I felt sad as I remembered my own children’s toddler experiences at that same library. Mobile devices were not on the market then, so the children would study the large dollhouse whose miniature decorations were changed seasonally, explore the shelves of books, and when it was time to check out, eagerly climb up the counter so they could watch the librarian—who always greeted them warmly.

Yes, this mother had a hassle-free trip to the library—but had her son missed out on a variety of real-life learning experiences?

As much as I love my iPad and iPhone, I am glad they had not been invented when my children were younger. Today, most experts recommend waiting at least a few years before introducing mobile technology to children.² Here are some of the pitfalls of introducing electronic devices too early:

- **Zoning Out.** Barnard College’s Center for Toddler Development has conducted studies of young children’s distractibility while playing with iPads, noting that when their names were called by researchers, the children were usually so distracted that they did not respond. When the iPads were confiscated, the children become more responsive.³

- **Shortened Attention Spans.** Michael Rich, an associate professor in the Department of Society, Human Development, and Health at Harvard School of Public Health, has expressed concern that, like television viewing, using iPads at a young age could lead to shorter attention spans.⁴

- **Missed Learning Opportunities.** Environmental stimuli determine early brain development, and technology-based stimulation has been shown to impair learning and cause cognitive delays. This is particularly crucial for young children, whose brains triple in size during the first two years of life.⁵

“Children under 2 years of age learn best from real-world experiences,” says Dr. Carolyn Jaynes, a learning designer for Leapfrog Enterprises, who suggests that children above the age of 3 can begin to benefit from electronic media.⁶

While most experts agree with the age of 3 being an appropriate time to start exposing children to mobile devices, some suggest waiting much longer. Pediatric occupational therapist Cris Rowan suggests waiting until the child is 12, pointing out that brain development continues up until the age of 21.⁷

Based on this information, teachers should use caution in introducing mobile devices in early learning and preschool programs—and move forward with extreme caution (after consultation with parents) when incorporating mobile devices into instruction at the elementary school level.

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Survey responses indicated that 87 percent of Jellico students with iPads agreed that these devices make homework easier. “We can work out problems on whiteboard apps, send in keyboarding from iPad, and if we lose our textbooks, or don’t want to lug one home, we can take pictures of the pages to read at home,” explained one Jellico student. “I think it teaches us responsibility as well.”

One of the benefits of using iPads in the classroom is an increase in organizational responsibility, according to a study at Bowling Green University. The eight college students who were given iPads and observed for 10 weeks showed clear improvement in their organizational and cognitive abilities. Specifically, the students reported that they benefitted from being able to keep their class materials in one location.²⁷

Beyond the realm of required homework, the iPad seems to have successfully combined fun and learning, engaging students in the classroom and motivating them to spend their free time in voluntary learning activities.

Among participants in an *iPads for Learning* trial administered by the Victorian Department for Education and Early Childhood Development in Australia, 90 percent of students said that learning was more fun when it occurred on an iPad.²⁸

Demonstrating one of his favorite apps, *The Elements*, a graduate from Bass Memorial Academy in 2012 commented, “One day, I just read and read. . . . Everything you could ever want to know, it can tell you.”²⁹

With apps like these, iPads allow students to dig deeper than a textbook could take them. Interactive features like games with quizzes engage students in the learning process. Also, the videos embedded into the digital textbooks give students a clearer understanding of what they are learning.

“My ultimate goal is to see a young person taking something like that outside the classroom and learn on his or her own time,” said Phil Wilhelm, principal of Bass Memorial Academy. “If apps are interesting enough, kids will get there and explore on their own.”³⁰

iPads for Better Health and Environmental Stewardship

Use of iPads and tablets can practically eliminate students’ heavy backpacks, which according to the U.S. Consumer Product Safety Commission, caused more than 21,000 backpack-related injuries in 2003. In addition, the Commission found that students with overloaded backpacks were more likely to have poor posture.³¹

Until the school switched over from laptops to iPads, students at Madison Academy were particularly at risk for such challenges. In addition to their laptops, they had a backpack full of heavy textbooks to transport to and from school. Now, many Madison students carry only their iPad and a collection of notebooks, and many of them mention this first as what they appreciate about iPad usage.

“If we had books this year, I don’t know how I’d manage,” said one sophomore at Madison Academy in 2011. “[The iPad] doesn’t weigh me down.”³²

A 2012 Jellico 8th grader agreed: “I think that having iPads has advantages because you save paper. . . . You can take notes and not have to take your textbook with you also. If you forget to turn in something that is due that day, and you go home and forget your paper but you brought your textbook, you can redo the paper and then e-mail it to your teacher and get in on time. That’s why I think that having iPads has its advantages.”³³

With the introduction of environmentally friendly iPads, the classrooms are moving toward becoming paperless. Students turn in homework, communicate with their teachers, and access their grades digitally. Some schools are even using iPads to replace textbooks.

“If you want to go green,” noted Madison Academy Principal David Denton, “iPads are the way to go.”³⁴

Consider also the contribution a school can make to environmental stewardship just by eliminating textbooks: Madison Academy enrolled 91

students during the 2011-2012 school year, each of whom typically would have had five textbooks—but that year, most of them had none. Assuming an average textbook length of 500 pages (or 225 pieces of paper), eliminating textbooks in one year replaced 102,375 pieces of paper—enough to save more than 12 trees!³⁵

And while some students still use paper for taking notes, others have found that taking notes on their iPad not only saves paper but is also more efficient.

“You can take notes much faster than writing,” reported a Madison Academy sophomore in 2011. “Then you always have it there, and you won’t lose it like you would lose a piece of paper.”³⁶

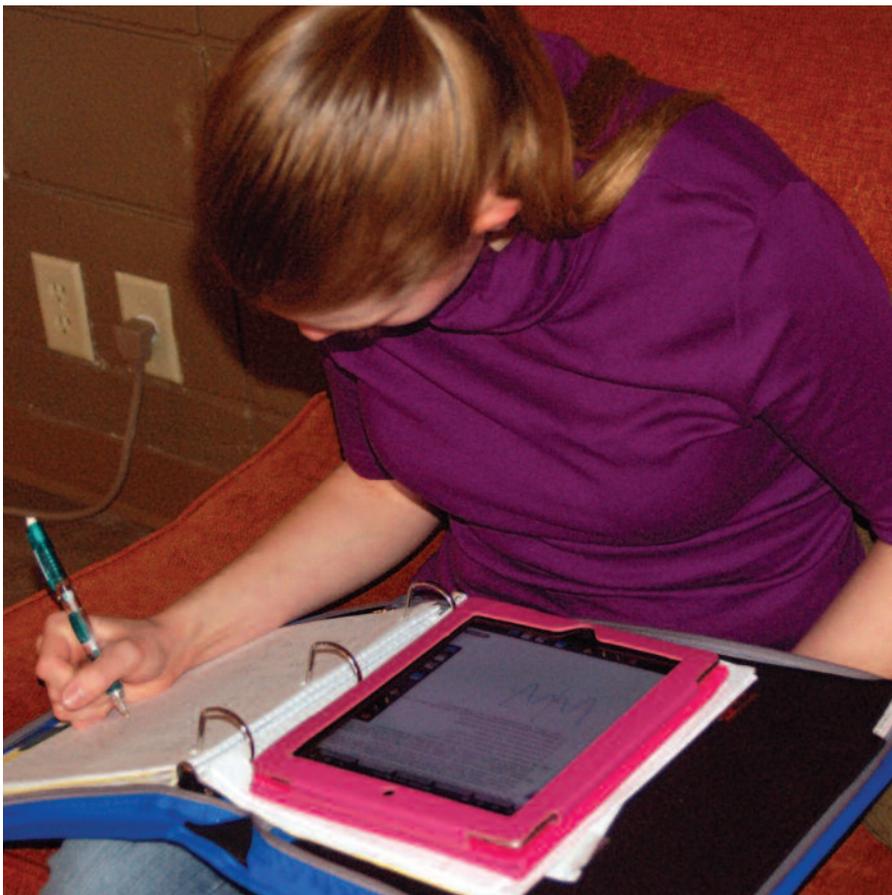
One favorite note-taking app is *iAnnotate*. Textbooks in PDF format can be opened in *iAnnotate*, which then allows students to take notes by highlighting, typing, drawing, or even audio-recording notes at appropriate places in their textbooks. Teachers are also using *iAnnotate* to mark up and grade digitally submitted assignments.³⁷

Paper-saving does not end when the student leaves the classroom. Bass Memorial Academy has seen a reduction in the amount of Internet research being printed in the computer lab now that students with iPads have access to their research around the clock, not just when the lab is open. With this change, the school is saving not only paper but also toner and electricity.³⁸

Challenges

Despite all the benefits of incorporating iPads and other tablets into the classroom, there are issues that must be resolved. Typical complaints about using the iPad include cost, Apple’s proprietary software, and their inability to use the Adobe® Flash® Player. (One teacher reports that she has found an app, *iSwifter*, to help her view Flash® programs on her iPad.)³⁹

But there are also fundamental challenges that educators should be discussing. Karen Melhuish, lead e-Learning Facilitator for CORE Education; and Garry Falloon, associate professor at “The University of Waikato” teaching



Mobile devices are portable and conveniently sized to enhance traditional learning experiences such as note taking and research.

and researching eLearning, stress the need for educators to receive training and support to help them blend pedagogically sound teaching with technical capabilities. Such support will increase the probability that teachers will find ways to incorporate deeper and more authentic experiences that expand learning beyond superficial activities that have little educational value.⁴⁰

In addition, teachers need to find ways to adjust to a more fluid classroom situation where they guide learning while maintaining a stable environment. Indeed, the classroom has the potential to move beyond its four walls, which increases a real need for “digital citizenship and information literacy skills, in order to navigate the challenges of what will become a much more accessible online environment.”⁴¹

Strategies for Keeping Students Safe Online

It is a fallacy to believe that a school’s blocking programs do away with the need to educate students on cyber-safety.⁴² The lack of an inclusive Internet safety curriculum increases the risk that students will use the Internet in inappropriate ways once they leave the school network. The need for safety is paramount. The iPad comes with some parental controls, but additional measures are needed to protect students online. Large schools often deploy a corporate Internet filter that reviews all traffic sent across a Wi-Fi connection. Often, iPads used in small schools or as personal devices are set up with a “Mobicip Safe Browser with Parental Control” software that filters online access. However, the best filtering strategy incorporates both digital sophistication and adult supervision.

Melhuish and Fallon explain that “The challenge for educators will be to

open security doors sufficiently to allow access to the full resources of the web, while at the same time, guiding, teaching and managing the challenges that more open and unfettered connection can bring.”⁴³

Another challenge faced by mobile device users is their tendency to reinforce and exacerbate an inherent fixation on individualism. Educators need to be proactive about providing learning pathways that embrace interpersonal interactions and are well-grounded in theory instead of primarily occupying student time with factual content or “edutainment.”⁴⁴

Heinrich’s study on effective usage indicates that while there are pedagogical and technical challenges to using personal devices, students clearly benefit from daily access across disciplines and subjects.⁴⁵

Concerns about the use of pads and other electronic devices by younger children are discussed in the sidebar on page 8.

Conclusion

Anecdotal evidence and surveys from educators in the field continue to build a case for the need of a long-term study on the effectiveness of mobile devices in improving student instruction and achievement. Long-term studies presenting hard evidence in this area have not yet been done.

Meanwhile, however, the benefits of utilizing more portable and personal devices are becoming clear. iPads and similar devices are proving to be fertile ground for our students and teachers to learn, explore, and innovate. These tools, when appropriately utilized, broaden the scope of available resources and inspire innovation and creativity.

“We’re just scratching the tip of the iceberg of what this thing can do,” noted Denton. “There’s more that we’re still learning that we can do with it.”⁴⁶

With the introduction of the iPad Mini, even more doors are being opened for the use of mobile technology in the classroom. This year, Bass

Memorial Academy has been transitioning to iPad Minis. In addition, the school has begun providing full-corded keyboards for each student. “We are trying to promote typing skills and efficiency when completing assignments,” says Wilhelm.⁴⁷

If your school or conference is contemplating the switch to iPads, consider getting advice from those who have already invested effort and finances so that you can reap the benefits without repeating their mistakes. ✍

This article has been peer reviewed.



Jonathan Sumner, M.A., is an Associate Superintendent at the Georgia-Cumberland Conference in Calhoun, Georgia. He also represents the

Southern Union on the North American Division Technology and Distance Education Committee. An Adventist educator for the past 25 years, he has served in various roles as administrator, educational technology director, and teacher.



Lori Futcher is a freelance writer and editor in Cleveland, Tennessee. Her previous work experience includes serving as editorial manager at South-

ern Adventist University in Collegedale, Tennessee, and as assistant systems operator for Adventists Online during the early days of the church’s involvement with online communication. Mrs. Futcher’s love for education has motivated her to take several undergraduate and graduate education courses, including a graduate course on technology in the classroom. Her article titled “Schools Going Green: What Schools Are Doing to Save the Environment,” which appeared in the October/November 2013 issue of *The Journal of Adventist Education*, was honored as a Finalist in the 2014 Distinguished Achievement Awards by

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