THE GAME CHANGER: USING IPADS IN COLLEGE TEACHER EDUCATION CLASSES

EUGENE GEIST

Associate Professor of Early Childhood Education
The Gladys W. and David H. Patton College of Education and Human Services
Ohio University

This article reports the findings of a study to examine the practicality and efficacy of using tablet computers in the Higher Education classroom. Students in a senior level teacher preparation class were provided with Apple iPads for 10 weeks to aid in their studies. The iPads were preloaded with selected software but students were encouraged to use them in the way that felt the most natural and beneficial to them. Results indicated that students thought that the device was most beneficial as an e-reader and a way to have instant access to information while the instructor was lecturing. They also found it to be beneficial in their clinical work in elementary school classrooms.

Introduction

"The individual learning model is foreign territory for most Net Geners, who have grown up collaborating, sharing and creating together online." Tapscott (2008)

Just as the college students of 2010 do not remember a time in their lives when the internet did not exist, the young children of today and the future college students of 2025 will not remember a time when there was not pad-based mobile devices and smart phones. Many refer to the current generation of college students the "net generation". Perhaps the college students of 2025 will be known as the "mobile generation". Mobile technology, the internet, social media and a slew of future developments that we currently can't even predict, are and will be a part of their life experience and will impact the way they learn and access information. This means that these student's fundamental view of learning, communicating and interacting will be very different from their educator's own experience (Tapscott, 2009).

Many of the adults who teach them grew up when little of this was available. This is a generation that expects to actively participate in and through their media, hence the decrease in time spent by teens in viewing television and the corresponding increase in time spent on computers, gaming, and the Internet (Beyers, 2009). The advent of mobile devices will continue to change how students access their media. They no longer need to sit in from of televisions to watch their favorite shows, nor are they restricted by when the show is broadcast. Streaming media has ensured that media and information are available when the individual wants or needs it. This perception will also influence how this generation approaches the education process.

Don Tapscott (2008) in a series for Business Week on the Net Generation wrote that the old model of pedagogy that is teacher-focused, one-way, and one-size-fits-all, makes no sense to young people

who have grown up in a digital world. He argues that members of the Net Generation have different mental habits than their Boomer parents. They expect a conversation, rather than a lecture, and they're used to working in groups, rather than working alone and, he argues, digital immersion has even affected the way they absorb information. They don't necessarily read a page in a textbook from left to right and from top to bottom. They might instead skip around the page, scanning for pertinent information of interest (Tapscott, 2008). He also points out that universities need to understand this change in order to keep pace with a changing educational landscape.

> In universities across the country, the smartest students often don't go to lectures. One Stanford student said to me recently: "The thing around here is to get an A without ever attending a lecture."
>
> This shakes up such old style professors as Mark Bauerlein, who wrote the book, *The Dumbest Generation*, arguing that "the digital age stupefies young Americans and jeopardizes out future." Educators like Beuerlein are uneasy with the change in power reflected in how information is dispensed and knowledge is obtained. Sadly, these old-style educators—locked into models that go back centuries—end up heaping abuse on the students who are revolutionizing the model of pedagogy (Tapscott, 2008).

Our education system does a generally poor job of assessing the needs of the learner and adapting curriculum content and delivery to meet those needs. Most classrooms and education practices are little different that they were 50 or even 100 years ago. Each of our past major societal changes has been accompanied by major changes in our educational systems. During the agrarian age, the one-room schoolhouse was the predominant paradigm of education, with its focus on tutoring and apprenticeship. During the industrial age, the factory model of schools became the predominant paradigm of education, with its focus on standardization and teacher-centered learning. Now, as we evolve ever deeper into the information age, society is putting great pressure on our educational systems to evolve in major ways and our schools are lagging behind (Reigeluth 2008).

Review of Literature

The use of technology in the classroom has been studies and debated for many years. However in the introduction of new classes of devices that use a touch screen interface and the ubiquity of mobile devices such as smart phones and portable gaming platforms, Facebook, Twitter and other social networking media have changed the nature of the debate. Many educators and parents are afraid that these devices are causing a "digital distraction" which is leading to a generation of children who have trouble focusing on tasks (Richtel 2010).

Shuler (2009a, 2009b) suggests that mobile devices have significant potential

to be a key ally in supporting learning experiences. They suggest that even with preschool children, apps are unquestionably a new medium for providing educational content, both in terms of their availability and popularity. She suggests that the academic community should pay attention to apps as an important potential factor in children's mobile learning. Shuler encourages researchers to investigate the implications of the current environment, and recognize "what works" in educating students. Banister (2010) suggests that teachers are needed to take up the challenge of integrating these devices in their classrooms and researchers are needed to document the impact.

Little is known about how touch screen devices work in educational settings because at the writing of this article, products such as the iPad have been available for less that a year. By the time this article is published, new versions of the hardware and software will have been released making, perhaps, many of the findings already outdated. However while the revolution of the touch screen interface will likely be around in education is some form, for some time, currently there is little if any research on the use of these devices in classrooms. There are some studies on the use of Smartphones in classrooms and some preliminary articles on pilot projects using iPads.

Smartphones

Milrad & Spikol, (2007) report the results of on-going activities regarding the use of smart phones and mobile services in university classrooms. The purpose of their trials was to explore and identify which content and services could be delivered to the smart phones in order to support learning and communication in the context of university studies. They found that generally, the services integrated transparently into students' previous experience with mobile phones. Students generally perceived the services as useful to learning. Even more telling, was that attitudes were more positive if the instructor adapted pedagogical style and instructional material to take advantage of the distinctive capabilities of the mobile devices. They describe a number of educational mobile services they have designed and implemented and conclude that usability, institutional support, and tailored educational content are key factors to successfully leveraging the use of these devices.

It is important to note that faculty involvement and acceptance of these devices was found to be especially important to the effective use of these devices. The next generation of students will be vastly different from any before due to mobile devices and the ubiquitous availability of information and data. Pedagogy will need to evolve to meet the needs of these students.

Sharples, Arnedillo-Sánchez, Milrad, & Vavoula, (2009) contend that the research on mobile devices in learning has facilitated the debate about the nature of learning within and outside the classroom. Focusing on the mobility of learners and learning reveals assumptions and tensions in technology-enhanced learning. Most research into technology-enhanced learn-

ing assumed that learning occurs in the classroom, mediated by a trained teacher. The authors contend that this has implicitly excluded the design of technology for informal and serendipitous learning. They feel that tensions are already arising between the two spheres of traditional context-bound education and informal mobile learning.

They describe a future scenario which portrays schools as being unable, or unwilling, to adapt to the new patterns of learning and social interaction outside the classroom and young people seeing school learning as irrelevant to their skills and interests. They propose that at the heart of the conflict is the technology itself.

> Schools currently ban powerful tools for personal learning and social networking while they struggle to provide computers that deliver an outdated form of didactic teaching. A very different future scenario depicts formal education adapting to the new technologies and opportunities, with children learning how to adapt their social networking practices to the school environment, supported by tools for teamwork and collaborative learning (Sharples et al., 2009 p 16-17).

Bielec (2010) states that desktop machines have become anachronisms because "place" is no longer meaningful. The priority is having access to just about anything from anywhere.

> Today's students carry fewer devices but enjoy increasing levels of interaction, connectivity, speed, and functionality. Their lives are integrated into the systems to which they enjoy instant and constant access. Their personal approach and unbounded mobility enable them to remain connected and engaged, almost without restriction—and that is the way they want it (Bielec, 2010).

iPads

As of the writing of this article, the IPad has been out less than 1 year and there are rumors and anticipation of the iPad2 and other tablet based devices that run Windows 7/8 and Android among others. Because of this, few empirical studies have made it to press yet. However a number of opinion articles have flooded the press in the last year. Waters (2010) wrote that Apple's iPad was the first of a new generation of devices and that this class of devices will continually change and improve in the coming years (Wong, 2010). Waters cites a pilot program that a school district in Indiana is using with the iPads with 15 students in an English as a New Language program, however since this was early after the release of the iPad, no data had been collected.

Foote (2010) described a pilot project a pilot project at Westlake High School in Austin, Texas that investigated whether iPads were helpful in a school and/or library environment. The pilot project was comprised of three ongoing projects, namely the use of the iPad for teachers, the library applications of the iPad for library student focus groups and small-group classroom assignments using the iPad. It relates that teachers have found the iPad as a useful tool for working with students with special needs.

Mathis (2010) reports on early efforts of universities to incorporate iPads into their institutions. George Fox University in Oregon uses technology as a recruiting tool and has given computers and laptops to all incoming freshmen since 1991. In 2010, students had a choice: MacBook or iPad. Eventually, officials say, the iPad will be the only option. He also discusses Cedars School of Excellence, a K-12 school near Glasgow, Scotland, and how they gave out iPads to its 105 students in the fall of 2010. Though there's no immediate plan to use e-textbooks, homework will be assigned and collected via e-mail — and completed in Apple's Pages software.

> "This is an issue, the amount of weight kids carry in backpacks," says Fraser Speirs, a Mac developer who is supervising the project. "If it can all be crammed into an iPad, that's a huge win right there." (Mathis 2010)

Finally Mathis reports that at Abilene Christian University, in Texas, Dr. Ian Shepherd has designed his fall 2010 Econ 261 class to incorporate a digital textbook from McGraw-Hill as well as PDFs of supplemental texts. He's perhaps most excited about the No Advance NOtice (NANO), an in-house assessment tool that lets him instantly quiz the entire class, which he believes will draw reticent students into classroom discussions.

All of these examples have a few things in common. First, they are mostly based on subjective reports and based on little actual data. Second, they are true research studies and have not gone through a rigorous peer reviewed process. Finally, these were articles published within a few months of the release of the iPad and so little time had been allocated to analyzing results of these pilots. However, one point seems to be evident in these reports that warrants further investigation and that is the role and reaction of the instructor and faculty member in the use and acceptance of these devices in the classroom and in changing the paradigm of instruction to fit current and future realities. Li (2010) reported in the Chronicle of Higher Education that Williston State College in North Dakota decided to give iPads to their entire faculty in hopes of keeping their faculty as "up-to-date" as their students and encourage faculty that may have never interacted with technology the opportunity to do so.

Method

This article will begin a report the findings of a research project to put iPads into the hands of college students in teacher education during a senior level curriculum development class. This study was conducted over the 2010-2011 school year. This course met for 4 hours a week and included 4-5 hours of clinical experience in a public school elementary classroom setting supervised by a licensed classroom teacher. The students were asked to use the devices to access materials such as course readings, videos, and the course management system (Blackboard Learn) for the curriculum class, but also to use the device in their other classes and keep a journal of their experiences. They were also asked to experiment with ways that it could be used to make them to enhance curriculum

for the elementary grade children. A number of foreshadowed questions were defined.

1) What benefits and/or detrimental consequences were evident by their instructors (including the researcher)? Mainly, was the iPad a distraction in the classroom setting? If students have these devices active during the class do they use it for schoolwork or do the ability to access the Internet and social and/or other media distract them.
2) How could social media, the Internet, and other media be leveraged to increase learning of these students? Instead of banning these devices as many professors do, could the propensity to be constantly connected through social media, texting, and Internet is a positive learning tool.
3) The final question was how the students would creatively use this technology in their teaching experiences. Technology in elementary classrooms is a hot topic in education and these touch screen devices offer great potential. How would these teachers in training creatively use such a device?

Data Collection and Analysis

Data was collected in 3 ways for this project. First was direct participant observation by the researcher. As their instructor for 4 hours a week the researcher was able to observe how the devices were used during lectures and class periods. The researcher also kept a journal about his feelings and experiences. Second, the students kept weekly blogs of their experiences and completed a survey at the beginning of the course and again as part of their final exam. Finally, interviews with select student participants, their clinical supervisors in their field placements and other faculty that had interactions with the participants during the quarter. The qualitative data was transcribed and then analyzed for recurring themes. These themes evolved as the school year progressed and they were examined more closely.

Findings

The findings from the surveys and interviews generally focused on 4 general themes: 1) Change to classroom interaction 2) Convenience 3) Use as a teaching tool in elementary classrooms and 4) Faculty resistance to mobile devices during lectures.

Classroom Change in Interaction

Instructors reported that the student participants generally brought their iPads to class each session. This gave them instant access to research and reading material which made in class small group discussions and short group research projects much more convenient. One instructor's comment was representative of most of the responses in this category.

> *Students were so happy to be able to download their textbook to their iPad. It was cheaper for them and that really made them less angry at me for making them buy so many books. I was also easily able to upload other readings in PDF for them to read without having to use the printer. When I had discussions*

about book material, students used the iBook to find quotes to support their ideas. I never saw that with a regular text.

Student's responses to surveys also supported that having the iPad changed the way that they interacted in class and with the instructor. Instead of having to schedule a computer lab or go to the library to look for information, the researcher and other faculty found that data was available instantly in the classroom. Group work became more efficient and more convenient. Instructors indicate that they would break up for short 10-minute group work assignments that utilized the iPad to do research. This would not be possible if the class needed to move to a computer lab to access the Internet.

Now that I have had the experience of using an IPad for the entire quarter not only for myself but also in my classroom, I think it is very beneficial. In the beginning, I was a little apprehensive about using this device but I strongly feel that it enhanced my learning in the classroom and also helped keep my own students in kindergarten actively engaged.

I think it is useful in a college classroom for a teacher to upload the required readings and videos. It makes students more willing to do the assignments because they are easy to access from the home screen. Teachers could also use them during class to make it more interactive and keep students on task.

One thing that became evident from other comments was that the preparation that the instructor put into developing and making materials available electronically the better they felt the iPad worked in the classroom. When electronic materials were not available either on a Learning Management System such as Blackboard, students were less enthusiastic about using the iPad in class and tended to use it for "off task" behaviors more often.

The iPad also allowed the instructors to use a wider variety of media. Instead of just assigning readings, with the iPad, video and web-based resources could be assigned for review before the next class period. Again, it was found that the easier the instructor made it for them to find and access this material the better. Students were enthusiastic about the use of Blackboard because of the ease of access to material, but were disappointed with its limitations such as not being able to complete assignments using a mobile device. Student participants wanted their mobile version of Blackboard to do everything that they needed to do. They did not want to sit at a desk and use a desktop or laptop computer. The future of Learning Management Systems (LMS) will be mobile and app based rather than web based.

Convenience

The student participants also supported this contention that using iBooks and electronic versions of the of the books. Here are what they had to say about its usage in the classroom. Many students

purchased electronic copies of their required books for the pilot class and for the other classes for which they were enrolled. Students reported that they saved money and that the e-book was easier to carry and access. Other professors who had these students also reported better engagement in class due to the easy access and search functions that the e-books provided

I actually also downloaded a regular textbook for another class as well and I love it. It is a LOT lighter than lugging around all your textbooks and really easy to access. It is also much cheaper than buying actual textbooks so I really liked that.

I liked how iBooks was set up. I liked flipping through the pages like you would flip a real book. I liked that I could carry the iPad around much easier than a textbook and that I could have multiple readings without carrying multiple textbooks. Negative aspects are that I wasn't able to underline, highlight, or take notes as I read. I also just prefer to read out of real books rather than on a screen.

I was able to access my course materials at anytime no matter where I was. Having the readings uploaded to my device prevented the need for useless printing and carrying around bulky textbooks.

Use as a Teaching Tool in Elementary Classrooms

One of the special benefits of using the iPads with this sample of students is the opportunity to see how they would use the iPad devices to enhance their own teaching and curriculum development with young children in elementary schools. Some student participants held some reservations about using them in the classroom with young children but were happy to see how the children reacted to the new devices.

I was worried that using the IPad would take away from the students doing a lot of work on their own. However, I quickly came to realize that the students benefited more my instruction when I had the IPad compared to when I didn't use the IPad with them. I think that the IPad is more useful to use than a computer. I feel this way because we can physically manipulate and touch things on the IPad whereas on the computer you can't do so.

The potential of tablet-based computers in the classroom is still being explored, but more and more schools and classrooms are finding new and innovative ways to use these tools. Each week new apps explore the boundaries of what is possible with portable touch screen devices. There are a number of reasons that the iPad proved to be a useful tool for elementary school teachers.

1. They allow children to explore independently. The intuitive interface allows children to manipulate objects in a natural way with little adult intervention.

2. They give children choice of the games and experiences. On a traditional laptop, an adult is often required to change programs or experiences.
3. They give the child control over their computer experience.
4. The experience is an active rather than passive experience. The touch screen interface allows for active interaction with the programs at a level not possible for young children on traditional computers.

Other comments by student participants support that using iPads in their work with elementary school students was a positive experience.

> *It allowed me to plan lessons with apps and use the iPad when I was teaching. It was easy to access blackboard and the different readings and movies that our teacher put on the iPad.*

> *I believe that technology like this should definitely be used in the class. I think that something such as the iPad could be used in group stations or in other small group settings. Looking through the available apps, it looks as if there is an app. for almost anything that you might be teaching, so I think that this would be a very useful tool to aid teachers.*

> *As I have taken out a few students to introduce them to the iPad and read along with the story, the students loved how it was a mini computer that they have never seen, and it truly seemed to help them because the words highlighted so they could read along. This really helped them since they visually saw what word was to be read. Negatively the students did not actually get to hold a book and flip the pages in a correct order, which I believe is included in learning to read accurately.*

Faculty Resistance

Instructors quickly realized that having the devices available to students during class periods changed the way that the class was conducted. When the instructor would lecture, students would often be browsing the Internet or checking social media rather than giving full attention to the instructor. However, when asked to interact and discuss, the students demonstrated that they were not detached from the material. During the discussions many accessed information to support or refute arguments.

Students reported that they do often use the devices during class time to read social media, text or other "off task" behaviors, but were universally baffled by instructors who were offended by this. The students claim that, contrary to the belief that the devices distract them, these devices actually help them to manage their attention, much like doodling in the margins of a notebook. The students contended that if they can understand the material and meet the standards of the course, then they should be allowed to do, as they like during lectures as long as they are not a distraction to other students or, if they

choose, to not come to class at all. As has been reported in the literature, there was some resistance and consternation from some faculty concerning the use of these devices during lectures. Faculty who were comfortable with new technology and used it in their classroom often were more accepting. However many faculty found mobile devices to be a distraction. The most common concerns were that students were not paying attention to the lecture and concern that if materials were delivered online, students would choose not to attend class.

Conclusions and Recommendations

Education as most of us understand it is changing and our educational system must change also. Mobile technology is a part of the DNA of future generations. To quote a popular TV show "Resistance if Futile". Our schools and educational institutions must change or they will be left behind. Faculty who restrict the use of these devices will find themselves fighting a loosing battle. Students will begin to see material irrelevant if they are not given the freedom and ability to interact with it in a way that suits them individually.

Mobile devices and web 2.0 applications have great potential in the classroom. However, for it to meet its potential classroom pedagogy will need to evolve. IT and Academic Technology professionals need to understand that it is no longer just about making technology available and offering support, but in helping faculty to evolve their pedagogical beliefs. Demanding that students not use laptops, phones, and iPads is going to become more and more impractical and even unintuitive for coming generations. We cannot continue to use 20th (and even 19th) century pedagogical methods in a 21st century learning environment.

The "app" will become the new way to deliver information quickly and efficiently. We are already seeing Schools, Universities and even individual classes and instructors having their own personal "apps" to deliver relevant information quickly and efficiently. It is no longer just sufficient to have a webpage or to use a course management system such as Blackboard or Moodle. Those resources will need to become mobile. Students want to do everything on their phone or pad device rather than on a laptop or desktop computer.

Mobile technology is moving speedily forward whether teachers and university faculty like it or not. The findings of this small study indicate that mobile devices can easily be incorporated into the classroom with a minimum of effort. However, it is the attitudes and pedagogical ideas of the teachers that will need to change to accommodate how the net generation sees their world and how they want to learn about it. By 2025, we will have children that have grown up never knowing a time when they did not have mobile devices with instant access to information. We must be prepared.

References

Banister, S. (2010). Integrating the iPod touch in K-12 education: Visions and vices. *Computers in the Schools, 27*(2), 121-131.

Beyers, R. N. (2009). A five dimensional model for educating the net generation. *Journal of Educational Technology & Society, 12*(4), 218-227.

Bielec, J. A. (2010). What's in, what's out. *University Business, 13*(8), 22-24.

Foote, C. (2010) *Checking Out the iPad.* Multi-Media & Internet@Schools; Nov/Dec2010, Vol. 17 Issue 6, p17-19,

Li, S. (2010) *Williston State College Gives iPads to Professors.* Chronicle of Higher Education; 9/3/2010, Vol. 57 Issue 2, p23

Mathis, J. (2010) *The iPad's School Day: Apple's tablet Hits the classroom.* Macworld; Dec. 2010, Vol. 27 Issue 12, p28

Milrad, M., & Spikol, D. (2007). Anytime, anywhere learning supported by smart phones: Experiences and results from the MUSIS project. *Journal of Educational Technology & Society, 10*(4), 62-70.

Richtel, M. (November 21 2010) New York Times - http://www.nytimes.com/2010/11/21/technology/21brain.html

Sharples, M., Arnedillo-Sánchez, I., Milrad, M., & Vavoula, G. (2009). In Balacheff N., Ludvigsen S., Jong T., Lazonder A. and Barnes S.(Eds.), *Mobile learning* Springer Netherlands.

Shuler, C. (2009a). iLearn; A Content Analysis of the iTunes App Store's Education Section, New York: The Joan Ganz Cooney Center at Sesame Workshop.

Shuler, C. (2009b). Pockets of Potential: Using Mobile Technologies to Promote Children's Learning, New York: The Joan Ganz Cooney Center at Sesame Workshop.

Tapscott, D. (2009) *Grown Up Digital: How the Net Generation is Changing Your World* McGraw-Hill: New York

Tapscott, D. (2008, 11/04). Net Geners Come of Age. *BusinessWeek Online*, pp. 25-25.

Waters, J. K. (2010) *Enter the iPad (or not?)* T. H. E. Journal; Jun/Jul2010, Vol. 37 Issue 6, p38-45

Wong, B. (2010). The iPad initiates the tablet tsunami. *Electronic Design, 58*(16), 77-77.