Creating Positive Learning Environments with iPads

Barry P. Langer

Purdue University

Abstract

As touch-based technology has propagated, Apple's line of iPad tablet computers has become a prominent fixture in educational settings. With a range of education applications offered and widespread availability, the iPad's use in classrooms has been well-documented across a variety of studies as it has found use at varying levels of education. From elementary, to higher education, to professional settings, educational technologists and teachers must be clear about how to most effectively deploy iPads for use in these multiple classroom settings. Through analysis of a variety of case studies and real-world examples, a series of recommended guidelines can be developed to provide increased assurance for the success of these programs. These recommendations include cost analysis prior to implementation, philosophies regarding educational app selection, and spans age groups to address the ways adult learners may differ from younger students. These recommendations are specifically applied to the use of iPads, but conclusions across other devices–those using touch, keyboard, or other forms of human input– can be drawn, though modifications, based on the unique strengths of these alternative formats, will need to be made by educators.

Introduction

When Apple first announced the iPad in June 2010, they sold three million of the first generation model in 72 hours–touting the device as "magical" and that this new product had would "defin[e] the future of mobile media and computing devices" (Harrison & Barrios, 2010). These devices have a wide range of uses, primarily concentrated on productivity and media consumption, and subsequent models led to billions of dollars in iPad revenue for Apple ("Global Apple iPad sales from 3rd fiscal quarter of 2010 to 2nd fiscal quarter of 2016 (in million units)," 2016). As the technology matured, the question of iPads as an educational tool began to be investigated. One of the most prominent rollouts of iPads was in the Los Angeles Unified School District (LAUSD), which "planned to spend $1.3 billion putting iPads, preloaded with the Pearson curriculum, in the hands of every student in every school" (Lapowsky, 2015). However, this "ambitious plan" came to a halt when LAUSD, "one of the country's largest school districts", sought a refund for iPads from Apple and Pearson, citing the difficulty in integrating the technology into daily use for students and teachers (Lapowsky, 2015). The issues presented by the deployment of iPads through LAUSD mirror a broader concern: what the necessary precautions are that educational technologists must take before and during the implementation of iPads[1] in their environments in order to ensure a successful adoption. The intent of this essay is to address questions surrounding student usage at all age levels. It also examines the use of iPads as a shared device or as an individual device, analyzing differences the device has as a tool for collaboration in different models. It also examines how usage patterns differ between implementations in younger students versus adult students.

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[1] Though the research in this document is pulled explicitly from examples using iPads, context for use can be established from these recommendations for a variety of tablet vendors.

Literature Review

Increasing Numbers of Devices

The rise of 1:1 programs, where each student receives an individual device for academic use, has been expanding in the last decade. This is especially true of the proliferation of mobile devices, largely due to Apple's line of iOS devices. In January 2015, "Apple announced that 250 million iPads had been sold worldwide" (Kastrenakes, 2015), and though these figures were not broken down into how many iPads were sold to businesses, individuals, or education institutions, the tablet form factor has largely become ubiquitous in present day personal computing. This represents a significant widespread cultural shift towards the application of touch technology in larger form factors than those provided by most smartphones. As touch devices at varying sizes continue to be developed, the question of how to best utilize this technology in classroom settings has become one with an increasing body of research being performed.

Potential Costs

This is due to the large numbers of schools currently investigating the use of iPads in the classroom, and combined with decreasing purchase costs of hardware and a ballooning library of available applications (Murray & Olcese, 2011, p. 44). However, the lower costs of devices such as the iPad in more recent generations does not mean these devices are fundamentally inexpensive; The Ohio State University (Swanson, 2015) invested over $11,000 into their "BuckiPad Pilot Program" which was used towards the purchase of

- twenty iPads, ten of which were the smaller iPad Minis and ten full-sized iPads,
- 1 Bedford power cart for charging and storage,
- heavy-duty Otterbox-brand cases,

- 1 Mac Mini for administration and app organization, and

- bulk purchases of educational apps for use in the program. (p. 18)

Swanson also notes that these costs did not address the human capital costs of dedicating time to device setup, nor what impact this had to any other initiatives the library may have been trying to work on while this program was underway. These costs are significant for schools that may implement iPads without properly assessing what the total cost could balloon to–especially in the event that the role expands to require full-time personnel.

These costs are not unique to The Ohio State University, and will be found in virtually all deployments of iPads or any such technologies. A similar pilot program at a Title I elementary school within the Flagstaff Unified School District in Arizona also used a cart to secure thirty iPads, in addition to screen protectors and cases; in their implementation, an Apple laptop was used for syncing and management (Conn, 2012, p. 32). Conn (2012) is also careful to note that iPads are considerably less likely to be damaged compared to a traditional computer, simply due to a more compact design with less parts (p. 33). This, however, may represent a fundamental misunderstanding of computer repair and the value of modular components as a more cost-effective alternative to whole-unit replacement in the event that device sustains damage.

Five Chicago Public Schools also rolled out a pilot of charging and sync carts consisting of thirty-two iPads each, alongside an Apple laptop, as part of a larger districtwide program. This does not account for an additional $5,000 spent on paid applications for this small number of library-managed devices, or the surprising amount of ongoing training that was required for the librarians' use of the devices (Perez, 2013, p. 23). The potential for cost overrun is expounded by an inexperienced administrator, as they may also take longer to resolve any issues that do arise.

Application of Specific Skills

Learning new skills and implementing them effectively can be a difficult task. However, many educators have been previously exposed to the use of laptops and desktop computers as a key component of their classroom design. The use of iPads within classrooms is seen as largely normalized (Psiropoulos et al., 2014, p. 221). Psiropoulis et al. (2014) also state that addressing any individual concerns with the technology through ongoing support is critical (p. 221), and that engaging fellow users for support, whether it be through in-person meetups or an online community, was essential to a positive experience when engaging with the iPad paradigm (p. 223). This kind of knowledge can only be gained through experience, implying that once the learning curve has been crested that device competency can be assumed after enough community exposure.

This is not applicable exclusively to iPads, as "the teacher and the context within which the technology is used are more crucial than the actual technological equipment in a given setting" (Mourlam & Montgomery, 2015, p. 107). Mourlam and Montgomery (2015) discuss this idea further by addressing the ways in which a group of burgeoning young teacher candidates, so-called "Neomillenials due to their experiences growing up with technology" (p. 107) felt comfortable through a self-guided examination of device capabilities (p. 110). A significant number of instructors involved with a federally-mandated iPad deployment at the university level within the United Arab Emirates felt excited at the initial prospect of engaging with iPads, so long as a supportive, collaborative environment for sharing tips and learning about the technology was provided to educators by the university system (Hargis et al., 2014, p. 51-53). Even though "some faculty members are not technologically inclined" (Hargis et al., 2014, p. 52), faculty would help one another to find solutions to issues presented by difficulties presented

in using iPads. This was further helped through the use of faculty guides, dubbed "iChampions"

(Hargis et al., 2014, p. 46), who provided a teach-the-teacher approach to the use of iPads in

classrooms.

Use as a Tool for Collaboration

In addition to instructor preparation, the environment into which the iPads are deployed is

of critical importance. A positive outcome here is, in practice, the primary reason why students

will use the technology in ways that are friendliest to them in order to create meaningful

connections in a collaborative learning environment. This holds true across age groups and

varied subject matter. Simpson, et al. (2013) found that younger students were able to use the

iPad to learn literacy skills together (p. 125). By working in pairs, where each student has an

iPad to work with, the students used touch to engage with one another's materials and to follow

along with each other or isolate each of their iPads for a specific task towards a shared goal (p.

126). This example of direct interaction between students, where they build understanding

together, is an apparent benefit of iPad usage that is not exclusively limited to children. An adult

student involved in an iPad pilot program at Pepperdine University stated that, "'You're more

likely to help each other when it's portable and you can see what each other is doing.'" (Fisher et

al., 2013, p. 166). The comfort that both of these age groups displayed toward their iPads, as

contrasted to potential difficulties using traditional laptops with less intuitive software, "allows

students to use it as a device for explanation throughout the problem solving process" (Fisher, et

al., 2013, p. 176).

This feeling of comfort will only be further extended as students have with devices will

only increase as the devices become more pervasive at home. This is apparent among older

students that have grown accustomed to iPads and smartphones in the past decade, where

"faculty have struggled with cell phones and tablets in the classroom" due to the prevalence of students "texting and messaging during class" which "can negatively affect attention by distracting other students" (Rosenthal & Eliason, 2015, p. 35). Even in a less obvious scenario for integrating technology, such as a physical education course, Rosenthal and Eliason (2015) found that rebuilding their instructional and assessment pedagogies to support the full integration of the iPad into the classroom proved more successful, especially when "learning objectives and learning activities are matched to the level of learning" (p. 37). The variety of applications where this technology can be applied makes the correct technique in use a problem of paramount importance.

Potential for Distraction

Distraction at the collegiate level seems to be less likely at this time when working with institutional iPads, since the age of current college students has not progressed to the point where current students would have been universally exposed to iPads at a young age. A pilot program at a private university in Malaysia found that, of the 19 typical usage scenarios measured by Yusup (2014), iPads were primarily used on tasks that directly impacted learning. These tasks ranged from accessing learning materials on the learning management system (LMS) or in Dropbox, to participating in LMS forums, to planning classroom activities (p. 16). This was seen by the participants as realized by direct benefits of the hardware, including "good touch screen; good text legibility; long battery life; reliable cloud storage; small and lightweight; responsive virtual keyboard; good resolution and screen contrast; durable" (Yusup, 2014, p. 17). Similar benefits were also realized in a pilot program at the Trinity College of the University of Melbourne and the University of San Francisco (Churchill & Wang, 2014, p. 217). Another implementation that was cited from the University of Texas at Tyler discovered that iPads

actually increased student-teacher collaboration, as "the participating students appeared to be more motivated to attend the class and turn in their assignments, and iPads lead students to be more responsible learners." (p. 217)

Although many students indicated that they were not distracted by the varied entertainment uses that the iPad provides; a notable example is found from soon after the launch of iPads in a classroom from Geist (2011). He presents a schism between how students and professors in a higher education classroom define distraction:

> Students reported that they do often use the devices during class time to read social media, text or other "off task" behaviors... The students contended that if they can understand the material and meet the standards of the course, then they should be allowed to…Faculty who were comfortable with new technology and used it in their classroom often were more accepting. 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.

Recommendations for Deployment

The literature review presented shows a substantial inclination of educators to wish to adopt current technology, in the form of the iPad, in the classroom. The iPad presents itself as an attractive device to use–whether for young students, older ones, or for continuing development for teachers. There are key takeaways from the literature that can be used to make proactive recommendations for libraries, school/school systems, and educational technologists making decisions as to whether to use iPads as a component of their learning environments.

The Mixed Results of Libraries

At both The Ohio State University Libraries and the Chicago Public Schools, librarians learned essential lessons for deploying their respective iPad programs. In Chicago, where "the results of this program far exceeded our expectations" (Perez, 2013, p. 24), the key was using the iPads towards a directly applied multimedia curriculum. By comparison, The Ohio State University BuckiPad program was not geared towards any specific course curriculum, and a lack of "intimate knowledge of students and their needs, expectations, and perceptions of library services and technology" (Swanson, 2015, p. 20) hindered the intended use of the devices. These disappointing results are not mirrored in classroom environments, which largely saw success (Churchill & Wang, 2014, p. 214) across many deployments. The planning of shared-use iPads, therefore, requires the educator to plan for a more individual approach to how the students may be handling these devices if they are to be used in a library setting, and it is not recommended to simply hope that students will jump into using iPads in a library without proper instruction as to the value from library staff.

Information Experience

The user experience surrounding the iPads was largely positive, across both the educator and student spaces. The hardware itself was a focus but per Apple's slogan, "There's an app for that" (Apple Inc., 2016). The physical device is less important, so long as certain basic criteria are met–wireless connectivity, touch screen, accelerometer, etc.–the apps are what is actually critical to adoption and use (Murray & Olcese, 2011, p. 45). This is a boon to schools; as the hardware requirements are minimized and app development is increased, the available pool of learning tools is fundamentally changed, especially as the the devices continue to evolve at a rapid speed. The iPad can morph into a calculator (Fisher, et al., 2013, p. 169), a book, a video player (Simpson, et al., 2013, p. 125), a repository of course materials, a notebook, a blog

(Churchill & Wang, 2014, p. 220), and a myriad of other uses. So long as the device is connected

to the Internet, its utility will increase. This additionally presents the opportunity for those

interested in iPad deployment with less expensive tablet technologies from other vendors.

However, the positive experience surrounding iPad use when educators are informed and aligned

with one another as to how to use the device well, seems likely to continue to provide a positive

experience for all users.

A Limitation of this Research

One seeming benefit of this research was that none of the literature selected was older

than 2011. Although this would seem beneficial, the iPad has undergone significant change

since its announcement in 2010. Moore (1965) predicted that the physical hardware (processors,

or "chips") required for the iPads to process tasks will double in speed every year as technology

progresses. This has largely proven true, and is being seen reflected both in hardware and

software. The speed at which applications are being developed for the iPad, even knowing that

upon its introduction there were tens of thousands (Murray & Olcese, 2011), creates an issue for

educators: how is it possible to maintain parity with newer revisions of these devices and their

regularly software? A simple requirement is for educational iPad administrators to compare

newly available apps and hardware options on a regular cadence, to confirm that whatever

devices and apps are installed can be updated to address updates and remain reasonably current.

Conclusion

Though educators must not be careful to simply adopt the newest exciting technology in

their classrooms, the iPad has proven itself to not be a fad. There is now a significant body of

research that addresses the effective use of the iPad in the classroom. As new tools continue to

evolve and be refined for the iPad, and other accessories are added that enable entirely

undocumented sensory experiences, the iPad/tablet is a singularly well-suited device for

education. Educators must take precautions to avoid mistakes with deployment, while avoiding

mistakes that could prove costly. Regardless of screen size, the millions of iPads currently in use

across individuals and institutions shows that it will remain a key component of the modern

classroom, and that properly introduced adoption will lead to positive learning outcomes for

students in a variety of scenarios.

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