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# An Alternative Undergraduate Teacher Preparation Program: A Comprehensive One-to-One iPad Initiative Model

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**Abstract**
To date, little literature has been published on how an alternative undergraduate teacher preparation program infuses mobile devices such as the iPad and its applications, model classrooms, and a high-tech computer lab to prepare teacher candidates. Preparing teacher candidates to generalize technological skills is most effective when it is hands on, using the varied devices and support available to them. Meaningful instruction, application and maintenance of technological usage is the key to 21st century teaching and learning but it will not occur without a designed plan of action or model. This article focuses on the prominence of the use of iPads for teacher candidates in higher education and its potential impact on the learning of students with varying backgrounds and abilities in public schools. Further, it provides conceptual, systematic, comprehensive, and ready-to-use three phases of an existing one-to-one iPad initiative model at a southeast institution of higher education in the United States of America.
**Keywords:** iPads in Higher Education, Mobile Learning, Pre-service Teachers, Teacher Candidates, Alternative Teacher Preparation Program

## 1. Introduction

As of fall semester 2014, the College of Education at a southeast institution of higher education in the United States launched a teacher education one-to-one iPad initiative model called EDvolution® {July 21, 2015, Edvolution, Reg. No. 4,776,835}. Teacher education includes faculty from four colleges across the university. The College of Education serves as the curricular and implementation leader of the initiative. This initiative was originally planned, proposed, and executed by the Dean of College of Education in conjunction with a technology committee. Its purpose is to enhance teaching and learning using mobile electronic technology for all education majors starting with their freshman year until graduation. There were four reasons why the initiative was proposed: (1) the number of surrounding school districts moving to one-to-one models of instruction in the service region, (2) feedback from the advisory board stating that technological skills were a baseline hiring criteria, (3) International Society for Technology in Education (ISTE) standards calls for the knowledge base, and (4) Council for the Accreditation of Educator Preparation (CAEP) calls for teacher preparation programs to be able to demonstrate candidate competency for the use of effective instructional technology.

All teacher candidates at the above institution have the options to rent, buy, and upgrade (i.e., after the first two years for a newer version) their iPads/apps at the institution's apps store throughout their programs of study. Further, periodic trainings are provided for all teacher candidates (student professional development on the initial training sessions when iPads were disseminated) and faculty (faculty professional development that includes basic, advanced, and on-going trainings) on the use of iPad and its applications. A conceptual framework of EDvolution® was primarily based on the constructivist's point of view (Vygotsky, 1978) that comprised of three interrelated phases in interactive teaching and learning between faculty and teacher candidates: (1) Tech for You, (2) Tech for Us, and (3) Tech for Them (see Figure 1). It is the aim of the above institution that these teacher candidates would continue to validate the use of instructional technology, particularly the consistent implementation of the iPad in their own classrooms for lesson planning and delivery after the completion of their teacher preparation programs. As Losh (2014) describes, when we allow students to use the digital technology to apply pedagogical information and create their own uses for application of this material, "the "off label" uses of digital technology happen, when scholarly resources can be appropriated by students to deepen hands on learning, that students develop a strong sense of their own agency. " (p. 227). Losh argues that usage of iPads, clickers and other digital technology creates a situation where students can

 

collectively address problems and use their intelligences and experiences to be creative and successful problem solvers. The goal of teaching is to promote critical thinking in a global arena. Approaching digital technology to use in this manner addresses the needs of various students, including the students who are culturally, linguistically, and ability diverse. While the use of digital technology facilitates the development and delivery of creative lessons for faculty members and teacher candidates in teacher preparation programs, it also helps these future educators to address the individualized needs of all types of learners in today's inclusive learning environments.

The purpose of this article is to: (1) provide researchers and practitioners an overview and rationale for the use of mobile technology such as the iPad and its necessary components (i.e., high-tech computer lab with trained personnel and technological classrooms equipped with movable tables and chairs) during teacher preparation programs, (2) offer a conceptual framework for development of teacher candidates' skills , and (3) discuss the potential benefits of integrating technology in higher education for teacher candidates, which in turn helps them to effectively implement mobile device such as the iPad and its applications to teach their own students with various learning abilities and backgrounds (e.g., culturally, linguistically, and ability diverse). Figure 1 illustrates the three-phase's model flow chart of the conceptual framework of EDvolution®.

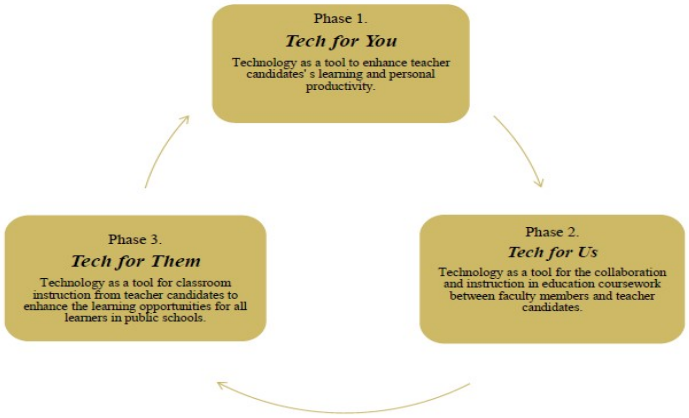


*Figure 1. A Conceptual Framework of EDvolution-A Three-Phase Model*

## 2. Justification for the Use of Mobile Devices in the Classroom

Over the past decade, there has been significant growth in the number of students who have mobile access to resources and information 24/7 that allow them to participate and learn from individuals all over the world through online social networks and communities (Kaiser Family Foundation, 2009). Students 8 to 18 years-old spend more than 7 hours per day (i.e., 7:38) using media technology (e.g., television, listening to music), an increase of 2.4 hours since 2005 (Kaiser Family Foundation, 2010). The Higher Education Opportunity Act (2008), P. L. 110-315 addresses digital learning and the need to provide teacher candidates with strategies to use technology to transform teaching and learning for digital age learners including accessibility instruction in post-secondary education for students with disabilities. The U. S. Department of Education's National Technology Plan (2010) offers a model of learning powered by technology. In order to engage and empower learning for all individuals, the NETP (2010) "…brings state-of-the art technology into learning to enable, motivate, and inspire all students, regardless of background, languages, or disabilities, to achieve. It leverages the power of technology to provide personalized learning and to enable continuous and lifelong learning" (Office of Educational Technology, 2015).

Mobile learning could happen anywhere, anytime with mobile devices such as iPads and it can change the focus of education in our classrooms (Franklin, 2011). Tablets have lavish touch-screen features, portability, numerous accessibility features, and apps. If teachers are to embed mobile technology into their practice, they must experience mobile learning in their initial pre-service training (Ally, Grimus, & Ebner, 2014). Geist (2011) found that teacher candidates benefited from using iPads in a curriculum course for 10 weeks. The course included 4-5 hours per week of an elementary school clinical experience in a classroom. The reported benefits included using the iPad: (a) as an e-reader (i.e., ease of access to downloadable text, course materials, readings, and downloadable less expensive text), (b) to easily access information during lectures, and (c) actively engagement between teacher candidates and elementary students during clinical experiences (Geist, 2011). Technology, in particular, assistive technology such as iPads and apps for iPads has been consistently used in pre-K (Parette & Blum, 2013) and K-12

 

classrooms.

In June 2013, the ConnectED initiative was announced by President Obama. The intent of ConnectED is to empower every teacher with the most suitable technological training to empower students via individualized learning and rich digital content to be able to compete with other countries and acquire decent jobs in this technological age. Ninety-eight percent of American students regardless of their income, including students in rural communities, will have access by 2018 to next-generation broadband under the ConnectED initiative. Mobile learning in the 21st Century is challenging educational institutions to create student outcomes and support structures for e-learning (Franklin, 2011). Educators "have always tried to take a holistic view of teaching and learning and prepare our students through a combination of skills, knowledge and dispositions. What is different now as educators we have competition in the form of devices that can deliver content quickly, access experts, and connect to anyone, anywhere" (p. 266). The question is, what are we doing in teacher preparation programs to prepare teacher candidates to keep abreast with the knowledge, skills, and dispositions needed to embrace e-learning using mobile devices such as iPads to teach public school students in the 21st century (Franklin, 2011).

Not long ago, several institutions of higher education reported that the use of iPads resulted in higher student engagement during weekly lectures as well as a tool to support the learning of teacher candidates (Hashim, 2014; Pachler, Bachmair, & Cook, 2010; Pegrum et al., 2013; Wakefield & Smith, 2012). Therefore, it would be mindful of any teacher preparation program that is in the process of beginning to implement mobile technology to consider these three critical points: (a) infrastructure to support technology demands, (b) professional development for faculty and students, and (c) a "buy in" by all involved individuals (i.e., administrators, faculty, and students).

Although there is an increasing body of literature and research on the use of iPads with students with disabilities, there is no published work on how a comprehensive teacher preparation program infuses the iPad, its applications, and its technological components (i.e., similar to EDvolution) into its existing undergraduate teacher preparation programs. Additionally, most of these undergraduate programs have no minimal instruction on assistive technology policy, devices, and services for students with disabilities.

## 3. Assistive Technology and the Benefits of the Use of iPads for Students who are Ability, Culturally, and Linguistically Diverse

### *3.1 Assistive Technology Policy, Devices, and Services*

In 1988, the Technology-Related Assistance Act (P. L. 100-407), also known as the Tech Act was enacted. The Tech Act, was the first federal law that focused on making assistive technology (AT) devices and services readily available to individuals with disabilities including young children (Fein, 1996, p. 1). In August, 1990 the Office of Special Education Programs (OSEP) stated that assistive technology is part of the process of developing a student's Individualized Education Program (IEP) (Schrag, 1990). Further, the 1997 reauthorization of the Individuals with Disabilities Education Act (IDEA) required IEP teams to consider the need for assistive technology for all children with disabilities in order to access the free appropriate public education (FAPE) in the least restrictive environment (LRE), the general education classroom.

The Tech Act was the first to define assistive technology. A comparable definition was later adopted by IDEA (2004), as "any item, piece of equipment, or product system, whether acquired commercially off the shelf, modified, or customized, that is used to increase, maintain, or improve the functional capabilities of a child with a disability" (20 U.S.C. 1401 (1) (A)). However, under IDEA (2004) the definition does not include "a medical device that is surgically implanted, or the replacement of such device (20 U.S.C. 1401 (1) (A))." If a student's IEP team determines he/she needs an iPad as part of their AT consideration of need, then one must be provided.

Assistive technology service means any service that directly assists a child with a disability in the selection, acquisition, or use of an assistive technology device. The term includes:

(a) The evaluation of the needs of a child with a disability, including a functional evaluation of the child in the child's customary environment;

(b) Purchasing, leasing, or otherwise providing for the acquisition of assistive technology devices by children with disabilities;

(c) Selecting, designing, fitting, customizing, adapting, applying, maintaining, repairing, or replacing assistive technology devices;

(d) Coordinating and using other therapies, interventions, or services with assistive technology devices, such as those associated with existing education and rehabilitation plans and programs;

(e) Training or technical assistance for a child with a disability or, if appropriate, that child's family; and

(f) Training or technical assistance for professionals (including individuals providing education or rehabilitation services), employers, or other individuals who provide services to, employ, or are otherwise substantially involved in the major life functions of that child (20 U.S.C. 1401(2)).

Although IDEA (1997, 2004) mandated the need for considering AT for every child with an IEP, it did not define consideration or what steps should be taken during the consideration process (Davis, Barnard-Brak, &

 

Arredondo, 2013). Typically, assistive technology devices fall into three categories: (1) low, (2) medium, and (3) high-tech. First, low-tech devices are typically non-electronic, require no training, and cost fewer than 100 dollars. For instance, low-tech devices might include pencil grips, adapted paper (e.g., raised lines), slant boards, and/or adapted writing or eating utensils. Second, medium tech devices include basic switches, adapted toys, software that requires some training and cost less than 500 dollars. Third, high-tech devices are typically the most expensive and require formal training. For example, high-tech devices include augmentative and alternative communication systems either dedicated or on hardware such as an iPad (Sadao & Robinson, 2010). Moreover, students without an IEP may qualify for assistive technology devices and training under Section 504 of the Rehabilitation Act of 1973, P.L. 93-112). In particular, Section 504 may require school districts to provide AT devices and training of such devices for qualified students.

## 4. Benefits of Using iPads with Students with Diverse Abilities

In recent years, there has been an increasing body of literature published on the use of iPads with students with disabilities (Chai, Vail, & Ayres, 2015; Gevarter et al., 2014; Hill & Flores, 2014; King, Thonrieczek, Voreis, & Scott, 2014; Kucirkova, Messer, Sheehy, & Fernández Panadero, 2014; Mason, 2013; Mautone, 2013; Meer et al., 2015; Murdock, Ganz, & Crittendon, 2013; Pinto & Garner, 2014, Rodriguez, Strnadova, & Cumming, 2013; Waddington et al., 2014). In a qualitative action research project of teacher and student perceptions of the use of iPads as instructional tools, Cumming et al. (2014) found that teachers used iPads in numerous ways to support student learning. Additionally, teachers found it easier to differentiate instruction and were enthusiastic about students increased engagement in learning. Additionally, they also stated that students were happy to use the iPads, became independent learners and were more capable of accessing the general education curriculum. It was also noted that iPads exposed students to the real world by learning the digital technology in the 21st century. These students stated that they could write and spell better, concentrate more (when using headphones), and overall it was enjoyable. All students expressed they would prefer to complete an assignment with iPads versus completing an assignment traditionally. The limitations of this study were the small sample size of teachers (five special education teachers) and students (four students, two 13-year-olds, one 14-year-old, and one 16-year-old).

Mason (2013) designed an instruction sequence for AT use: (1) introduce the AT device, (2) model the use with verbal descriptions, (3) scaffold with hand-under-hand, if needed, (4) independent practice with homework, and (5) monitor and maintain the device. The researcher used the iPad and the instructional sequence tool with a student with multiple and visual disabilities using a wheelchair outlining a suggested lesson plan order of 10 lessons to introduce the iPad to the student with physical and visual impairments. The first three lessons address hardware and accessibility. Lesson one begins with an introduction of the iPad (hardware), lesson two covers accessibility features beneficial to the target student (i.e., VoiceOver, Zoom, and Large Text), and lesson three addresses accessibility Apps for the target student (e.g., Bigger and Brighter and Read to Go). One important point discussed when working with a student who moves about using a wheelchair, was to mount the iPad, paying particular attention to the student's field of vision preference so he/she does not have to hunch over to see; RJ Cooper (http://www.rjcooper.com) has numerous wheelchair mounts. Overall, future research should include more diverse populations, larger group size, and a variety of research methodologies (Cumming et al., 2014) including children who are culturally and linguistically diverse.

### *4.1. Benefits of Using iPads with Students who are Culturally and Linguistically Diverse*

There were more than 90% of Hispanic children born in the United States (out of 74 million children in the U.S). Further, differences in demographics by ethnicity were: 52.4% non-Hispanic white, 35.6% Hispanic, 13.2% non-Hispanic black, and 6.4% non-Hispanic Asian (Murphy, Guzman, & Torres, 2014; Nguyen et al., 2015). Culturally responsive teaching is using the cultural knowledge, prior experiences and performance styles of diverse students to make learning more appropriate and effective (Gay, 2010). With the ever-evolving ream of technological advances it is imperative that educators have a keen understanding of which methodologies work best with their students. Schools that incorporate these practices are preparing 21st century learners for a rapidly changing world.

Using iPads and its applications is beneficial for culturally and linguistically diverse students as it recognizes each student's individualized needs and validates who they are. Further, each student is acknowledged by building on their gifts and talents as the teacher uses a variety of instructional strategies to encompass the different learning modalities that exist in the classroom. A culture of excellence is created as the teacher understands the importance of incorporating numerous techniques to meet the varying needs of their students. Gay states (2010), "Culturally responsive teaching enables students to be better human beings and more successful learners" (p. 34). As teacher education programs move forward with preparing teacher candidates for the 21st century classrooms it is imperative that these programs stay abreast of the escalating trends and equip faculty and staff with the critical technological tools and resources to educate tomorrow's teachers.

 

To date, there are very few publications on the use of iPads with students who are culturally, linguistically, and ability diverse. The Newcomer Center, is an alternative High School for ELLs, where students from around the world spend their first year of schooling learning English language skills before being transferred to their home school. In September 2010, the Newcomer Center personnel distributed iPads to 30 students to use throughout their day. Prior to their iPad initiative students were seen in the school cafeteria in cliques conversing in their native language. Immediately after the implementation of iPads students were using their iPads to access translation and dictionary apps, to look up the meaning of words, to have conversations with others, and to clarify ideas (Demski, 2011).

Rivera, Mason, Moser, and Ahlgrim-Delzell's (2014) research used an iPad loaded with Ibook Author to create personalized shared stories in both English and Spanish to teach vocabulary words in both languages. Initially, the student learned vocabulary words in his home language more quickly but eventually his English vocabulary accelerated over the course of the study. According to a social validity questionnaire, educators agreed the technology was effective and expressed their anticipation to use the technology more frequently with other students in their classroom with additional trainings. One of the implications of their research was the importance of teacher educators being culturally responsive to meet the needs of their students.

### *4.2. iPad Applications and Accessibility Features*

There are numerous applications (apps) that have been developed for iPads that can be found on the APPitic website. APPitic began in 2012 as a translator for non-English speaking countries for app store descriptions. Their website now lists over 6000 apps in over 300 categories including preschool, k-12, Bloom's Taxonomy, multiple intelligences, students with special needs, and accessibility resources including Universal Design for Learning (UDL) (http://www.appitic.com/). Further, SayHi Translate is a universal voice translator for 43 high quality languages and dialects (http://www.sayhitranslate.com/). For additional iPad resources see Table 1.

Table 1

*iPad iOS Accessibility Features*

| Accessibility Feature by Category | Description of Accessibility Features |
|---|---|
| Vision | |
| VoiceOver | Reads everything on your screen (can adjust speaking rate and pitch; speaks > 30 languages) The Alex Voice: a natural sounding voice, pausing and taking breaths (free) |
| Speak Screen | Swipe down from top of screen with two fingers to turn on or ask Siri (voices' dialect and speaking rate can be adjusted, words can be highlighted when read (works with books, e-mail, messages or webpages). |
| Dictation | Tap the microphone bottom on your keyboard to activate (writes what you say including numbers) |
| Zoom | Magnification between 100 and 1,500% for full screen or picture in picture mode (works with all apps from App store and VoiceOver) |
| Font Adjustments | Increases font size (including bold text; works with some third party apps) |
| Inver Colors and Grayscale | Apply filter settings systemwide and background color (or grayscale) to everything your viewing even video |
| Braille Displays for IOS | iPad has access to > 40 wireless Braille displays in > 40 languages (3GS or later) with VoiceOver |
| Hearing | |
| FaceTime | See people as you communicate with them (while speaking or using sign language) |

 

| | |
|---|---|
| Close Captions | Watch podcasts, movies and TV shows with close captions. Look for the CC icon. Closed Captions supports open captions, subtitles (different styles and fonts can be customized) |
| Messages with iMessage | Communicate with people or groups using iPhone, iPod touch or Mac (also sharing pictures, video, locations, links) |
| Mono Audio | Can play both audio channels in both ears while adjusting volume or balance in either ear with headphones |
| Visible and Vibrating Alerts | Set visible (LED light flash or photo) and vibrating alerts (use with calendar events, text messages, mail and/or expected calls, or FaceTime) |
| iPhone Hearing Aids | Pair with your iPad iOS device using any Bluetooth |
| Physical & Motor Skills | |
| Assistive Touch | One finger access: access items on your iPad with a tap of your finger (you can create a custom gesture), Allows you to access rotate and shake when mounted on a wheelchair (supports some third-party assistive devices) |
| Siri | Ask Siri a question or give a command to find locations, send messages/reminders, schedule meetings etc., Siri can turn on Invert Colors and Guided Access |
| Switch Control | Navigate sequentially through your screen using a variety of Bluetooth switch hardware |
| Dictation | See Dictation under vision. |
| Keyboard shortcuts | Customize a shortcut for frequently used words or phrases (or names, street addresses, email) and iOS will type it for you |
| Predictive Text | Makes suggestions for the next word you use based on what you have said previously with whom you are talking |
| Support for 3rd Party Keyboards | Swipe or type using classic keyboard layout (iOS 8) |
| Attention Challenges or Other Cognitive & Learning disabilities | |
| Speak Screen | See Speak Screen under Vision. |
| Dictionary | Helps user with spelling, pronunciation, grammar, definitions, and commonly used phrases (built into iOS) |
| Safari Reader | Removes ads, buttons, and navigation boards (can reduce distractions and used with VoiceOver and Speak) |

*Note.* Additional information on Apple accessibility features for people with disabilities can be found at: http://www.apple.com/accessibility/iOS/#vision. Accessibility Tips and Features can be found at: http://www.apple.com/iOS/accessibility-tips/. Additional accessibility information can be found in the iPad IOS User Guide at: https://manuals.info.apple.com/MANUALS/1000/MA1595/en_US/ipad_user_guide.pdf.

The iPad has numerous accessibility features for all students including students who are culturally, linguistically, and ability diverse. Kagohar et al. (2013) found iPads to be simple to operate, highly adaptable with accessories such as microphones, cameras and speakers, and they were socially acceptable. Examples of accessibility features for students with disabilities include assistive touch, using one finger access, switch control, using a variety of Bluetooth switch hardware, Braille displays, and Speak Screen. Speak Screen is an important feature for English language learners because voices' dialect and speaking rate can be adjusted and words can be highlighted when read. The following section provides an overview of why teacher candidates need to begin to use iPads in institutions of higher education.

 

## 5. The Rationale for Teacher Candidates to Use iPads in Higher Education

In today's ever-changing technological world, the ability to acquire instant information is not constrained by the immobility of desktop computers. Individuals of all ages now carry and use mobile devices. Recent advances in technology have definitely gained positions and prominence in daily routines and higher education. These escalating evidences have been demonstrated through the extensive use of internet, email, social networking, and course management software (Hargis, Cavanaugh, Kamali, & Soto, 2014; Looi et al., 2010; Rossing, Miller, Cecil, & Stamper, 2012). Mobile tablets such as the iPads have been dexterously making their way to the massive global market since the first introduction of the Apple iPad in April 2010 (Nguyen, Barton, & Nguyen, 2015). Since then, the use of mobile technology (e.g., iPads, Smart phones) has yielded a drastic escalation by college students from 1.2% in 2005 to 62.7% in 2010 (Rossing et al., 2012).

Acquiring the critical knowledge across content areas in teacher preparation programs requires an interactive learning environment. It is nearly infeasible for teacher candidates to achieve the above task unless they are given numerous opportunities to engage in in-depth group discussions between peers and faculty members (i.e., far beyond what has already been presented by traditional lectures). Integrating technology such as the use of iPad in higher education classrooms reinforces the constructivist perspective of learning since it strengthens teacher candidates' abilities to use their multiple learning preferences and collaborate among others during weekly class meetings (Naimie, Siraj, Ahmed Abuzaid, & Shagholi, 2010; Vygotsky, 1978). Moreover, several studies reported that the iPads have been adopted, accepted, and viewed as the most popular device used by younger individuals, professionals, or "tech-savvy" learners (Armstrong, 2011; de Winter, Winterbottom, & Wilson, 2010; Fusch, 2011; Nguyen et al., 2015; Pegrum, Oakley, & Faulkner, 2013). Further, Nielsen (2010) conducted a study of 400 iPad users and found that 63% of iPad owners were under the age of 35. Other studies revealed undergraduate students and faculty in higher education preferred the integration of technology such as the iPads into their weekly classroom lectures (de Winter et al., 2010; Diemer, Fernandez, & Streepey, 2012; Fisher, Lucas, & Galstyan, 2013; Franklin & Smith, 2015; Wakefield & Smith, 2012). Additionally, Mang and Wardley (2012) found that there were fewer distractions for college students to use the tablets such as the iPads when compared to the use of laptops. These authors reported that students who used iPads were less likely than laptop users to engage in social networking, instant messaging, and watching movies during weekly instructional periods.

Given the rising popularity of recent iPad's usage, the increasing need for classroom teachers (i.e., faculty members in higher education and public school educators) to combine and restructure their pedagogical knowledge with the use of mobile devices, and the fact that most school districts across the United States have begun to implement various technological devices such as the iPads and its applications in primary classrooms (Beschorner & Hutchinson, 2013), there are clearly justifiable reasons for introducing an initiative that includes the fundamental purpose for technological implementation and its practical implications in both teacher preparation programs and public school classrooms. What follows below is a suggested model for how such a program might be implemented.

## 6. A Three-Phase Implementation for Undergraduate Teacher Preparation Programs

The recent increase in the use of iPads in teacher preparation programs (Gagnon, 2010; Pegrum, Howitt, & Striepe, 2013; Pegrum, Oakley, & Faulkner, 2013) suggests an ongoing transformation from traditional to technology-infused classrooms. Not long ago, several institutions of higher education reported that the use of iPads resulted in higher student engagement during weekly lectures as well as a tool to support the learning of teacher candidates (Hashim, 2014; Pachler, Bachmair, & Cook, 2010; Pegrum et al., 2013; Wakefield & Smith, 2012).

To date, no literature has been published on how an undergraduate teacher preparation program infuses iPads and its applications, model classrooms (i.e., both in higher education and public school classrooms), and a high-tech facility as a technological consolidation to be used by both faculty members and its teacher candidates throughout the duration of their training. The next sections provide a description of the three conceptual phases through which the teacher candidates at the above institution progress (i.e., this current model at the above institution is being evaluated annually on its overall effectiveness). Next, table 2 illustrates the three critical phases with three major purposes and components.

 

Table 2

*Phases for Implementing iPads in an Alternative Undergraduate Teacher Preparation Program*

| Phase | Purpose | Component |
|---|---|---|
| 1. Tech for You | The use of technology as a tool to enhance teacher candidates' learning and personal productivity | a. Student out of the box basic use seminars<br>b. Direct support in the instructional technology lab |
| 2. Tech for Us | The use of technology as a tool for collaboration and instruction in education coursework between faculty members and teacher candidates | a. Integrated use in education coursework<br>b. In class use in group work, higher integration of technology for your skills<br>c. Practice and modeling the uses of effective technology in the field of education<br>d. Appy Wednesdays |
| 3. Tech for Them | The use of technology as a tool for instruction to enhance the learning opportunities for all learners in public schools | a. The application of the technology in field experiences and student teaching |

*Note.* The EDvolution One-to-One iPad Initiative Model. Copyright 2014 by the College of Education at the above institution.

### *6.1 Phase 1: Tech for You*

Wang, Wiesemes, and Gibbons (2012) defined mobile learning as a process that is not circumscribed in a particular traditional educational context; therefore, teacher candidates could use mobile devices/technology in conjunction with the opportunity to be involved and "move" within multiple learning environments (i.e., group collaborations in a physical environment or classroom and "surfing" other relevant content-related environments on the Internet). During today's emerging evolution of technology-enhanced learning, accessibility and availability of an innovative physical environment or a high-tech facility, resources and equipment are pertinent to the success of mobile learning or the implementation of the iPad initiative.

Despite the on-going skepticisms as to whether or not institutions of higher education should continue to explore mobile learning based on the increasing demand from students or teacher candidates, additional empirical evidence in future studies is necessary for the academics to validate and examine the statistical significance of incorporating mobile technology such as the iPads and it applications into instructional pedagogy across content areas (Gagnon, 2010; Kinash, Brand, & Mathew, 2012). There are a number of tangible and intangible elements that need to be addressed in the next three phases. To begin a similar alternative undergraduate teacher preparation program of the above southeast institution of higher education, "tech for you" is the first phase in infusing technology as a tool to enhance teacher candidates' learning and personal productivity. There are two components in "tech for you": (a) student "out of the box" basic use seminars, and (b) direct support in the instructional technology lab. First, after purchasing or renting the iPad from the University, teacher candidates are required to attend several initial training seminars on how to use the iPads and its applications. Second, similar to the Instructional Resource and Technology Center (IRTC) at the above institution, a high-tech computer lab (i.e., desktop stations, interactive stations for collaboration with laptops, printers, projectors, laptops for check-out, SMARTBoards, innovative meeting room, well-trained technical personnel) should be established for both faculty members and teacher candidates to use the iPads and its applications as well as engaging in various on-going class projects.

In addition, the following are among the crucial elements (i.e., pedagogical objectives), support, and specific rule for both faculty and teacher candidates to consider on the daily use of iPads:

- Specified rule and limitations (e.g., no Internet "surfing" in non-educational websites during lectures)
- Note-taking skills during weekly class lectures (i.e., including the use of screenshots integrated into lecture notes or during lab work or apps that convert notes to flashcards for study purposes)
- Enhance organizational skills
- The use of appropriate applications and resources in the preparation for high-stakes assessments (e.g., state-required exams)

 

- Peer-to-peer and student-to-faculty collaborations in and outside of class, and
- The opportunity to receive consistent support from the high-tech computer lab personnel

Continuing from phase 1, the subsequent phases 2 and 3 further discuss the practical and sequential implications of the iPad and its applications in both classrooms in higher education and public schools.

*6.1.1. Phase 2: Tech for Us*

With the above preliminary phase 1 established, this next phase (phase 2- Tech for us) involves the use of technology (i.e., iPad and its applications) as a tool for collaboration between faculty members and teacher candidates and instruction in education coursework. There are four components in this phase 2: (a) integrated instructional use in education coursework, (b) in-class collaboration (c) practice and modeling the uses of effective technology in the field of education, and (d) Appy Wednesday's-once a month collaborative sharing between faculty and teacher candidates regarding a specific use of apps.

First, teacher candidates would most likely be experienced with the alternate interactive learning environment created by modern classrooms in higher education (i.e., modern classrooms need to be equipped with not only the technological devices such as air server, projector, SMARTBoards, and/or Apple TV, but contemporary, movable/adjustable tables and chairs should be in place to promote group discussion and collaboration between faculty and teacher candidates during weekly lectures) and the implementation of the iPad and its applications. Second, teacher candidates would also use the iPad to take weekly class notes, to access online discussion forums, and to "surf" the internet to acquire the needed information in group collaborative sessions. Moreover, teacher candidates could use the iPads as a tool to present their work and engage in effective peer-to-peer interactive discussions. Third, during each lecture, faculty members could begin to use brief Power-Point slides as springboards for in-depth discussions with teacher candidates. iPads and various applications such as the "Baiboard" (i.e., an application for brainstorming, organizing, and presenting information) could be used during weekly lectures to organize information, exchange ideas, and present group work. Both teacher candidates and the faculty are engaged in numerous group discussions and projects with the use of the iPad and applications. Acquired technological and content knowledge from class activities is constantly shared among teacher candidates and faculty. Fourth, faculty and teacher candidates meet on the first Wednesday of every month to share knowledge about currently used apps. The next phase (phase 3 below) takes teacher candidates from multiple training and practice into the actual implementation in public school classrooms.

*6.1.2. Phase 3: Tech for Them*

It is inarguable that mobile devices such as the iPads are being adopted by numerous public schools. However, quantitatively, the literature offers little evidence regarding its potential impact on facilitating students' daily learning in public school sectors (Lindsey, 2011; Pegrum et al., 2013). Since its introduction to the existing undergraduate teacher preparation program at the above institution, EDvolution® has been fueled by its potential to enhance school teachers' ability to meet the diverse needs of students with different backgrounds and learning abilities. Concurrently, the expectation in an increasing number of school districts is that teacher candidates be proficient in using modern mobile technology such as the iPads to effectively provide instruction to students in K-12. Continuing from phase 2, this last phase focuses on technology as a tool for instruction to enhance the learning opportunities for all learners. The only major component of "tech for them" is the application of the technology in field experiences and student teaching. Therefore, it is the faculty's responsibility to regularly explore and practice with teacher candidates the iPad' applications to be used in their own K-12 classrooms. Next, it is also critical for faculty or supervisors in field experiences or student teaching to ensure that teacher candidates are consistently implementing effective pedagogical practices with iPad' applications in their weekly lesson planning and instruction.

## 7. Future Directions

Despite the fact that limited empirical evidences suggest that there are correlations between the use of iPads and students' learning (Diemer et al., 2012; Fisher et al., 2013; Hahn & Bussell, 2012; Mang & Wardley, 2012; Wakefield & Smith, 2012), classroom teachers are increasingly expected to integrate emerging mobile technology such as the iPads in their daily instructional practices in public schools. In order to respond to this demand from the P-12 world, it is necessary that teacher candidates begin learning these technological skills (e.g., the use of iPads) and various applications during their teacher preparation programs. It is also imperative for additional qualitative and quantitative studies to be further conducted in both higher education and P-12 settings. For instance, the following few questions should be explored in future studies that align with the above three conceptual phases of EDvolution®: (1) "Do teacher candidates learn better using mobile technology?", (2) "Do teacher candidates and faculty members collaborate more efficiently using mobile technology during weekly lectures?", (3) "Do the students (with or without exceptionalities) of these teacher candidates learn better when they are taught with mobile technology?" and (4) "Are school districts across the country willing to include emerging mobile technology as part of their periodic professional development for in-service teachers?" In addition, as stated in previous sections of this article, it is pertinent for future studies to place an emphasis on

 

exploring the potential impacts of the use of iPads, applications, and other supportive technological components (i.e., Edvolution) for students with

various ability, cultural, and linguistic backgrounds in both higher education and public schools. These "to-be" collected evidences and collaborative practices between higher education and public school sectors would serve as an emerging body of knowledge that allows researchers, practitioners, program developers, and administrators to examine and validate the impacts and effectiveness of the use of iPads, its applications, and implementation on student daily learning.

## 8. Concluding Thoughts

With the proliferation of personal electronic devices across educational sectors, there is a need for models of implementation. In recent years, although there have been a number of studies conducted on the implementation of mobile technology; however, there has not been any published research on how an undergraduate teacher preparation program infuses other critical components (e.g., model classrooms and high-tech computer lab) besides the sole use of iPads and its applications. The three-conceptual phases described above provide such a model. Based on the most recent limited findings on iPads' embryonic phase in higher education and the assorted yet limited research methods used in previous studies (i.e., case study, experiments, multiple case studies, survey, and design-based research), there seems to be a pressing need for additional and multiple large-scale studies on its effectiveness in the training of teacher candidates. Nevertheless, in order to be well-prepared to teach children with varying needs, it is critical that teacher candidates be provided with immediate opportunities to respond to the abrupt shifts in technology and the classroom culture in the twenty-first century public schools.

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