IGeneration: A Study in Challenge Based Learning at a Small Private University

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IGeneration: A Study in Challenge Based Learning at a Small Private University

By

Jodi A. Hift

A Dissertation Presented in Partial Fulfillment

Of the Requirements for the Degree

Doctor of Education

in

Educational Leadership

Lynn University

December 5, 2013
ABSTRACT

JODI A. HIFT: IGeneration: A Study in Challenge Based Learning

at a Small Private University

Faculty-buy in is an essential component of successful technology integration processes at the Higher Education level. The goal of this case study was to assess the University faculty’s role in the utilization of Challenge Based Learning while teaching undergraduate students. Did the University have the faculty’s support and buy-in concerning the use of Challenge Based Learning as a campus-wide initiative? The perspectives of 16 full-time University faculty members enrolled in a Challenge Based Learning pilot study were explored at the beginning of the Challenge Based Learning pilot and then and were assessed again upon the completion of the pilot. The findings of the study were in favor of using Challenge Based Learning again.
APPROVAL OF DISSERTATION IN PRACTICE

IGeneration: A Study in Challenge Based Learning at a Small Private University

By

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IGENERATION: A STUDY IN CHALLENGE BASED LEARNING AT A SMALL PRIVATE UNIVERSITY

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Lynn University, 2013

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PROQUEST
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Introduction

The time marking the creation of the first technologies dates back 2.5 Ma (millions of years ago; megaannum). Since these times, the world has witnessed the introduction of the computer into the classroom. The introduction of digital technologies into the classroom has prompted the spending of countless dollars, hours, and efforts geared towards analyzing the effects of technology on teaching and learning. To some people, the results of such analyses are pathways to rebuilding public confidence in education (DeMillo, 2012); to others, the results of such research remain inconclusive (Marcoux & Loertscher, 2009). Yet, still to others, the recent stress placed on studying the effects of technology on teaching and learning reflects a growing need to understand how students learn when immersed in a technology-fused environment. Regardless of discretion, the twenty-first-century classroom makes use of digital technologies in an attempt to engage and empower the teachers and students within (Business Wire, 2011). Researchers believe that technology offerings such as digital content, mobile devices and online learning are the key to the twenty-first-century campus (Ambrose, 2001; EDUCAUSE, 2008) - a landscape of diverse technologies combined with endless possibilities for creativity, innovation, and learning.

Today’s 21st Century Campus uses technology to empower students and faculty, facilitating the personalization and expansion of the learning experience. Most 21st Century Campus initiatives are designed to help students develop the ability to
communicate, collaborate, think critically, utilize media to gather information, and incorporate an awareness of the world – goals that are central to success in the Millennia.

Twenty-first century digital technologies have become an integral part of a student’s life (Prensky, Digital Natives, Digital Immigrants, 2001) and have done so at an increasingly rapid rate (Business Wire, 2011). “The state of the consumer market as it pertains to smartphone and tablet ownership among undergraduate students can be summed up by this simple statement: “mobility is pervasive and devices are prolific” (Dahlstrom & diFilipo, 2013, p. 4). Most students own several different digital devices and make use of these tools with great ease, oscillating their uses between both academic and private purposes (Ricoy, Feliz, & Couto, 2013).

A growing proportion of today’s undergraduate students own at least one form of digital technology and the even younger generations have lived their entire lives in a world containing the Internet (Walker & Jorn, 2009) and many varieties of digital technologies (Roblyer & Doering, 2010). By the beginning of the year 2012, 62% of undergraduate students owned a smartphone, marking a 5,000% increase in undergraduate smartphone ownership over an eight-year span (Dahlstrom & diFilipo, 2013). As a consequence of the rising student owned and utilized digital technologies, faculty and staff are also using personally-owned technology devices as work-related resources, taking advantage of the mobility factor and utilizing the tool both at school and at home (Dahlstrom & diFilipo, 2013). In other words, in order to meet the need of today’s student, faculty are adapting to today’s digital technology trend.
Positively correlated to the increase in digital technology ownership among students is the increase in the numbers of students that desire courses with some online components. Students now have higher expectations for college instructors to demonstrate seamless integration of technology within pedagogical practices (Dahlstrom, 2012). Out of 3,000 undergraduate college students surveyed from 1,179 colleges and universities, nearly a third desired that their instructors used more online components (Dahlstrom, 2012). Students who rate instructors as highly effective users of technology are significantly more likely to agree that technology delivers substantial benefits to their academic experience (Dahlstrom, 2012). Such benefits include but are not limited to basic access to resources and information, simpler administrative activities, and increased productivity (Dahlstrom, 2012).

Jumping back thirty years ago, before *A Nation at Risk* was first published (The National Commission on Excellence in Education, 1983), a typical public school was ill equipped to take on a digital technology revolution (Allen, 2008). However, the 1983 report published by a group commissioned by the U.S. Secretary of Education to addresses the concerns over the quality of education in America brought technology in the classroom to the forefront of public concern. Following a grim warning that “our Nation is at risk” (The National Commission on Excellence in Education, 1983, p. 9), the report outlined several recommendations for more technology in the classroom. Since the report’s publication, technology has changed today’s culture and foreshadowing a world where computers and computer-controlled equipment penetrate every aspect of our lives (The National Commission on Excellence in Education, 1983).
The first decade of the twenty-first century proved that technology would penetrate the world culture at expediential rates. The number of people connected to the internet worldwide increased from 350 million to more than 2 billion, while the number of mobile-telephone subscribers rose from 750 million to over 5 billion (Schmidt & Cohen, 2013). As digital technologies rise in practice and in classroom presence, traditional teaching and learning strategies become increasingly ineffective (Apple Inc., 2009). Today’s schools must complete in an environment within which high quality educational content is readily available online and is free of charge to anyone (UCL, 2012). These digital technologies not only have the potential to enhance traditional classroom teaching but when coupled with an appropriate learning design, can also support more interactive, creative, and constructive learning (UCL, 2012). Unlike the previous generations, the students of the iGeneration “have instant access to information, are accustomed to managing their own acquisition of knowledge, and embrace the roles of content producer and publisher” (Apple Inc., 2009, p. 1). Due to this cultural and technological shift, and prompted by the need to create new ways of engaging students, Apple worked with educators across the country and developed the concept of Challenge Based Learning (Apple Inc., 2009). Challenge Based Learning is a teaching model that incorporates aspects of problem-based learning, project-based learning, and contextual teaching and learning, and focuses on real problems of global importance that affect students’ lives (Laurence, Smith, Smythe, & Varon, 2009), all while leveraging the educational process with accessible technologies.
The landscape for learning is evolving rapidly and young people are increasingly dependent on personal technologies (Burden, Hopkins, Male, Martin, & Trala, 2012). These changes in both students and in student life mean that today’s students are no longer the people our educational system was originally designed to teach (Prensky, Digital Natives, Digital Immigrants, 2001). What makes emerging digital technologies unique is their greater accessibility, lower costs, and increased user-friendliness (Willcockson & Phelps, 2010). The students of today are unique because they represent the first generation to grow up with digital technology (Prensky, Digital Natives, Digital Immigrants, 2001). Research proclaims that the average first-generation digital-native college graduate spends less than 5,000 hours of her life reading, yet spends over 10,000 hours playing video games (Prensky, Digital Natives, Digital Immigrants, 2001). A recent poll of 60 students living on campus and attending school at Virginia Tech found that more than half of their dormitory residents use two or more mobile technology devices at any given time (New, 2013). Furthermore, projections suggest that by 2015, the use of mobile tablets like the iPad will overtake desktop usage (Rossing, 2012). Students acknowledge that although technology is vital to their education both now and in the future, schools are failing to meet their needs (Business Wire, 2011).

Information technology experienced a key transition in the shift from passive audiences to active users, and with digital technologies, users have unprecedented control over content consumed and the places in and the pace at which they consume it (Vega, 2013). “At the heart of effective technology integration practices, digital technologies offer learners greater opportunities to be more actively involved in the learning
experience” (Vega, 2013, par. 2). Just over half of high school students feel adequately prepared to successfully utilize technology in higher education settings and beyond (Business Wire, 2011). Four hundred high school students and 302 high school faculty members ranked on a one-to-five scale the extent to which they believed technology was integrated into a class (CDW-G, 2010). Yet, the discrepancy between the extent of technology integration that the students observe within the classroom and the extent the faculty believe that the technology integration occurs within the classroom remains strong (CDW-G, 2010). While 67% of the 302 surveyed individuals assert to have a comprehensive district-wide understanding of how students want to use technology as a learning tool; only 47% of students agreed with the claims (CDW-G, 2010). Yet, as mobile tablets revolutionize higher education instruction across the academy (Miller, 2012), schools are beginning to grasp the challenges, implications and educative potential of technology. Simultaneously, schools are learning how best to adapt these digital technologies to current educational practice (Burden, Hopkins, Male, Martin, & Trala, 2012).

By the time students have reached the undergraduate level, they expect technology to be integrated into their learning process (Dahlstrom, 2012). One reason for these expectations is the student-held belief that technology is critical to academic success and plays an important part in future accomplishments (Dahlstrom, 2012). “Students expect their instructor to use technology to engage them in the learning process, and the instructors are responding” (Dahlstrom, 2012, p. 9). In 2010, less than half (47%) of undergraduate students reported that their instructors effectively use
technology to advance students’ academic success (Dahlstrom, 2012). Two years later, more than two-thirds of undergraduate students (68%) reported the same (Dahlstrom, 2012).

**Background to the Research Problem**

Today’s learning shift is not as much about the information that is available, but rather about the speeds at which knowledge travels through vast amounts of connected people (Oblinger, 2012; Renes & Strange, 2010). The President of the University recognized that expectations of today’s higher education institutions include (1) the effective that the integration of digital technologies and (2) the skills demanded for effective use. Subsequently, the school’s president assembled a committee responsible for bringing 21st Century digital technologies to the school in the hopes of increasing connectivity between and among faculty and students. By opening up the modes of dialogue to stretch beyond the limitation of classrooms walls, a technology transcending physical boundaries would need to be implemented. The committee ultimately settled upon the Apple iPad as the device of choice.

A pilot was formed in October 2011 to test the iPad at the University. Explored during the two-and-a-half week pilot were the following elements: classroom scheduling, faculty support, faculty survey responses, iPad Apps, the iPad loaner program, iTunes, and personnel. Each section was assigned to a different University affiliate. The scope of this paper focuses on faculty buy-in.

**Purpose**

The purpose of this study is to examine the extent to which university faculty
members want to use Challenge Based Learning in a course other than the course taught
during the pilot study. In order to investigate the extent to which faculty would want to
use Challenge Based Learning a second time, a committee comprised of university
administrators chose 16 full-time university faculty members from a volunteer sample.
All selected faculty had taught at least one course during the two-week 2012 January
term (J-term). The researcher used these 16 professors to conduct a pre-experimental,
one-group pre-test/post-test study. The study took place at a small, private, American
nonprofit, coeducational, residential university located in South Florida (Lynn University,
2012).

The University provided each of the 16 chosen professors with a free iPad.
Additionally, each faculty member was provided with free hands-on training sessions
where participants learned both how to use their iPads and how to implement Challenge
Based Learning into their classrooms. All 16 professors were expected to used their iPads
to aid in the implementation of Challenge Based Learning in a least one class during the
2012 J-term. J-term, or January term, is a two-and-a-half-week block of classes offered
annually at the University. All first-year undergraduate students at the University are
required to participate in one of the 22 offered courses all of which provide students with
the opportunity to learn in an unconventional, experimental fashion.

"J-Term is a two-and-a-half week mini term where students learn in
unconventional, exciting and often experiential ways" (Laura, 2012). The University's
fourth annual J-[for January]-Term (Laura, 2012) marked the inaugural launch of the
Citizenship Project (Stephens, 2011), requiring all first-year undergraduate students to take one of 22 courses in the Dialogues of Innovation (Stephens, 2011).

Challenge Based Learning is a learning initiative, a way by which educators can approach teaching. The Challenge Based Learning approach is different from other teaching methods because not only are all of the lesson themes in some way connected to ideas of global importance, but the learning process also calls every student to action (Adams & Johnson, 2011). Furthermore, assessments are continuous, as the measures of progress outweigh any possible final product. The purpose of assessment in classrooms is to help students learn and to improve instruction, rather than being used only to rank students or to certify the end products of learning (Shepard, 2000).

**Research Question**

The research question examines to what extent the University faculty would want to use Challenge Based Learning in other courses.

**Rationale of the Study**

People often suggest that that public education in America is in trouble (Laurence, Smith, Smythe, & Varon, 2009, p. 1). Although the report implicating the declining state of the American public education system is dire, the news is anything but new. Since the 1983 publication of *A Nation at Risk*, billions of dollars have been invested in the American education system (Hodge, 2007). Despite the fact that America spends more on education that most other countries, (George Washington University, 2012), America sees three out of every ten students drop out before earning a high school diploma (Apple Inc., 2008; Barton, 2005; Johnson & Adams, 2011).
Although research has yet to pinpoint exactly why America lags behind the world in college attainment (Ferenstein, 2012), the 2012 Education at Glance (EaG) report put out by the OECD posits that the cause is not due to a lack of funds as some has suggested (Organization for Economic Cooperation and Development, 2012). “The U.S. spends almost $11,000 on every K-12 student. Other nations spend less – and get better results” (George Washington University, 2012, par. 1). On nearly every measure of education (instructional hours, class-size, enrollment, college preparation), the content students learn in school does not translate into later-life success (Ferenstein, 2012). Still other research reminds us that since America began comparing itself with other countries in 1964, the United States has never ranked at the top of the international educational tests. Yet, despite these low international rankings, the country has been able to sustain a dominant status as an economic and innovative force in the world (Ferenstein, 2012). Some research are quick to point out that there have been some short-term gains made by United States (U.S.) students in the areas of science and math. However, these gains have been caused more by the erosion of education around the world than because of actual improvements made to the U.S. educational system (Laurence, Smith, Smythe, & Varon, 2009). What has been relatively steadfast are the high dropout rates and low graduation rates among U.S. students. U.S. high dropout/low graduation rates may be due to the lack of relevance that students perceive between their lives and the school subject matter (Laurence, Smith, Smythe, & Varon, 2009). The world around us has changed – and our students have changed with it. Schools are no longer designed to produce factory workers. Today’s schools emphasize the need to reflect upon common
problems, trends, and goals, and the need to promote democracy through education while providing the opportunity for every individual to self-actualize (Faure, 1972).

In the early years of the twenty-first century, digital technologies have been transformed by their users to serve as communication networks (Castells, Fernandez-Ardevol, & Qui, 2006). “From a professional communication device catering for an upscale market, mobile devices have become mass-consumer products that are woven into the communicative practices of hundreds of millions of people everywhere in the world” (Castells, Fernandez-Ardevol, & Qui, 2006, p. 260). As the marketplace of learning technologies continues to grow and vary in terms of content, quality, implementation, and context of use (Vega, 2013), mobile technologies offer a more flexible approach to learning and schools are moving towards mobile learning as a way to take advantage of this. The wave of new electronic devices available in today’s market offers portability while also being budget-friendly (Wylie, 2013). “Netbooks, iPads, cell phones, iPods, e-readers and even PDAs are increasingly becoming the tools of choice for today’s educators...They are versatile, motivating, and active learning tools” (Wylie, 2013). These aforementioned mobile technologies are tools of choice for both opportunities of constant connectivity and convenience.

According to a research report issued by an international community of experts in educational technology known as the New Media Consortium (NMC), without immediate, conscious, and focused efforts, the problems facing the failing American education system will only multiply (Laurence, Smith, Smythe, & Varon, 2009). Now is the time that “we need to think differently” (Laurence, Smith, Smythe, & Varon, 2009, p.
2). “The 21st-century workplace increasingly demands that graduates demonstrate technological competence and entrepreneurial ability” (Pannapacker, 2013, par. 4). New standards for education have been set by using the latest tools and technologies available to push production to the limits and provide an engaging learning environment. Ultimately, “students are more engaged and motivated to learn when they use mobile devices, and research shows that academic performances can improve” (Wylie, 2013, par. 16). In other words, as the opportunity for students to utilize mobile technologies increases, so do the levels of student engagement and motivation, and subsequently, academic performance.

Throughout its young history, the University has taken calculated steps to ensure the advancement of its educational mission statement: “Our mission is to provide the education, support, and environment that enable individual students to realize their full potential and to prepare for success in the world” (Lynn University, 2013). In the beginning, the University used discussion in the classroom. These classroom discussions, known on campus as the “Dialogues of Learning,” provide students with an environment for students to absorb and share information. Five decades have passed and providing content to students via alternate means. To deliver content to students one such manner, the school turned attention to a mobile platform: the iPad.

As with any new initiative, faculty involvement is essential (Olds & Miller, 1995). Capturing the experience of 16 university faculty members was the explicit goal of the pilot, as gaining insight into how faculty felt about repeating the integration would be critical to helping others decide if the approach is right for them while also
maximizing the attractiveness and usefulness of the project for faculty in the future.
Stakeholder buy-in is essential if an initiative is to be a success. Unless the community has the stakeholder buy-in from the start, program success is unlikely. Furthermore, once stakeholders are on board with a program’s purpose and concepts, the stakeholders are more likely to remain involved, supporting the program over its lifetime.

**Aim of the Research**

The main research question guiding the evaluation study is: to what extent do university faculty members want to use Challenge Based Learning in other courses? The study was not designed to investigate technical issues associated with the specific use of iPad devices nor the leadership and management of change issues, but where these issues affect teaching and learning they are reported and some recommendations are drawn. The types of issues that were identified were within the scope of professional development training for faculty members implementing iPads in their classes.

Professional development includes matters of technology integration.

“Technology integration is the use of technology resources -- computers, mobile devices like smartphones and tablets, digital cameras, social media platforms and networks, software applications, the Internet, etc. -- in daily classroom practices, and in the management of a school” (Edutopia, 2007, par. 1). The goal of professional development in the realm of technology is to provide teachers with the tools necessary to achieve a seamless integration when working with students. Seamless integration is achieved when students not only use technology on a routine (daily) basis, but do so using a variety of
tools that match the task at hand while providing students the opportunity to build a deeper understanding of content (Edutopia, 2007).

**Definition of Terms**

**Challenge Based Learning.** In Challenge Based Learning, students refine the problem, develop research questions, investigate the topic using a wide variety of primary source material, and work out a variety of possible solutions before identifying the most reasonable one (Laurence, Smith, Smythe, & Varon, 2009).

**Demographic Characteristics.** Demographic characteristics (attribute variables) were measured using two multiple-choice items that appeared on the faculty pre-survey: question one regarding sex (options limited to female or male) and question two regarding ethnicity (option limited to African-American, Asian-American, Hispanic, Native-American, multi-ethnic, white and non-Hispanic, or other).

**Dialogues of Innovation.** The two-week January school term required of the University undergraduate students (one course per each of the four undergraduate years) (Lynn University, 2013).

**iGeneration.** Any persons born in the 1990s and beyond (Rosen, 2011).


**Professional Development.** The ongoing Challenge Based Learning opportunities provided to the faculty members throughout the pilot.
**J-Term.** January 06, 2012 – January 20, 2012. "J-Term is a two-and-a-half week mini term where students learn in unconventional, exciting and often experiential ways" (Laura, 2012). The University’s fourth annual J-[for January]-Term (Laura, 2012) marked the inaugural launch of the Citizenship Project (Stephens, 2011), requiring all first-year undergraduate students to take one of 22 courses in the Dialogues of Innovation (Stephens, 2011).

**N-Generation.** Today’s high school and college students (Garfinkel, 2003).


**Portability.** Ease of transport of an electronic device. This may refer to a pocket-sized handheld device or to a laptop that weighs several pounds (The Computer Language Company Inc., 2013).

**Tablet.** A computer with a stylus input device (rather than a keyboard or mouse).

**Significance**

The iPad research pilot was conducted with the intentions of gaining insights into how to use technology to purposefully enhance teaching and learning at the University. Specifically, this study hopes to bring the element of greater faculty insights to current research.

**Limitations**

Limitations are events that happen during a study which are out of the researcher’s control (Simon & Goes, 2013). "Every study, no matter how will it
conducted and constructed, has limitations” (Simon & Goes, 2013, p. 1). Despite the significant statistical findings resulting from the research, there were limitations that threatened the study’s reliability and validity. One such limitation to this case study is the inability to draw inferences. Although the study’s results are suggestive of what is in the University at large, additional research is needed to verify the case study’s generalizability. Without such research, the study’s validity is compromised. Another limitation to the study includes faculty prior experiences. Results from the pretest suggest that while some faculty members considered themselves to be novice tablet or mobile technology users, other members rank as highly proficient or technologically savvy. This variability in technical prowess among faculty members may compromise reliability factors. Another aspect of faculty prior experiences includes faculty prior perceptions, which too can limit the study and jeopardize reliability. The instruments used presented another limitation to the study; the assessment measures used were not tested and validated prior to being administered to the faculty involved. The nature of self-reporting and analysis introduce researcher biases that were additional study limitations. Additionally, since a University-wide executive committee chose the sample, the participants in the sample and the sample size (N=16) served as another study limitation. Finally, neither the pretest nor the posttest was piloted and subsequently, one is unsure if these instruments are valid and reliable.

This chapter introduced the study and summarized the background, rationale, aims, theoretical framework, limitations/delimitations and scope of the study. Chapter II is a summary of the literature related to educational technology, with the major areas of
Challenge Based Learning discussed. Chapter III presents the methodology employed in the study, focusing on action research. Results are presented in Chapter IV, and Chapter V presents a discussion of the findings, conclusions, and recommendations.
CHAPTER II
LITERATURE REVIEW

Technology and Learning: a Socio-Genetic Perspective

Just as learning involves constant changes, technologies are continuously perpetuated forward, influencing human biology and cultural evolution along the way. The acquisition of "complex, pragmatic skills (like stone toolmaking) can only be acquired through deliberate practice and experimentation, leading to the discovery of subtle casual relations that would remain ‘opaque’ to observation and stimulation alone" (Stout, Passingham, Frith, Apel, & Chaminade, 2011, p. 1335). With the production, acquisition and modification of each component tool comes the understanding of when, why, where, and how the technology is best used. “The complex problem solving and planning demanded by composite tool manufacture may have influenced the evolution of the frontal lobe” (Ambrose, 2001, p. 7). Among some of the consequences of this frontal lobe brain evolution are increases in population density (as reflected by both the increases in living human populations and the intensified exploitation of small prey), expansions to higher, colder latitudes and altitudes, and the dispersal of modern humans across distant lands (Ambrose, 2001).

The Masters

John Dewey’s (1859 – 1952) brought to the field of education a strong belief in the unity of theory and practice, which led to the examination, and ultimately the transformation, of the state of American education. Dewey’s philosophy of education is based on the idea that the scientific method could be applied to anything (Campbell,
Dewey emphasized experience, experiment, purposeful learning, and freedom, among other concepts of “progressive education.” Dewey peered at the concepts of progressive education through a lens of pragmatism (Ecker, 1997). Education pre-twentieth century relied heavily upon subjects or cultural heritage for the source of content (Dewey, 1938). Alfred L. Hall-Quest, editor of Kappa Delta Pi Publications, recalls traditional education as involving “rigid regimentations and a discipline that ignored the capacities and interests of child nature” (Dewey, 1938, pp. 9-10). In the early and mid-1900’s, Dewey’s “new” school exalted learners’ impulses and interests and the current problems of a changing society (Dewey, 1938). In the Dewey school of thought, for an experience to have any educational value, the experience must lead to growth that in turn must lead to further growth, and so on. Hence, Education is the means of social continuity of life (Dewey, 1916).

Dewey asserted that learners were to obtain from schools whatever was missing from personal lives and was yet essential for balanced development if one was to become members of a democratic society (Warde, 1960). Like many of the educational reformers of the nineteenth/twentieth centuries, Dewey dealt with two distinct aspects of learning: the specific stage in human growth of the learner and the efforts to reform the archaic educational regime to better fit the revolutionary social changes that had taken place (Warde, 1960). Since the time of Dewey, “technology has reorganized how we live, how we communicate, and how we learn” and theories such as Dewey’s were developed in a time when learning was not affected by digital technologies (Siemens, 2004, par. 1).
Learners as little as forty years ago would complete the required schooling and enter a career that would often last a lifetime. Information development was slow. The life of knowledge was measured in decades. Today, these foundational principles have been altered. (Siemens, 2004, par. 2)

New measures of schooling are now needed to accomplish the goal of democracy in a society fueled by technological advances.

**The iGeneration**

Learners of today are in control of their own learning acquisitions. “Students today have instant access to information through technology and the web, manage their own acquisition of knowledge through informal learning, and have progressed beyond consumers of content to become producers and publishers” (Apple Inc., 2010, p. 3). The open world brings about empowerment and freedom (Tapscott, Four principles for the open world, 2013) and this seamless access to limitless amounts of information via digital technologies has created a new mind: “Students think and process information fundamentally differently from their predecessors” (Prensky, Digital Natives, Digital Immigrants, 2001, p. 1). This first generation of students to grow up with digital technology have spent their entire lives surrounded by and using computers, videogames, digital music players, video cameras, and cellular telephones. “These kids are different” (Tapscott, 2013, par. 5). Subsequently, a different approach to learning is now needed.

This need to change the way society currently approaches schooling is driven by today’s teaching techniques which best cater to the students of yesteryear. “Our children
and youth are immersed in technologies that give them opportunities no previous generation has enjoyed” (Rosen, 2011, par. 1). Some people refer to these first generations students as N-[for Net]-gen, other people prefer D-[for Digital]-gen, and still other people refer to these “native speakers” of the digital language as Digital Natives (Prensky, Digital Natives, Digital Immigrants, 2001). Regardless of the term assigned, research suggests that the traditional methods of teaching and learning are becoming less effective at engaging and motivating these students (Apple Inc., 2010). Unlike their predecessors, Digital Natives are used to receiving information at an accelerated pace, prefer to parallel process and multi-task, wish for a graphic to appear before the text rather than vice versa, thrive on instant gratification and frequent rewards, and function best when networked (Prensky, Digital Natives, Digital Immigrants, 2001). Indeed, digital technologies have changed the way students access and view information (Georgina & Hosford, 2009).

Digital technologies have changed the way students access and view information by increasing student access to resources and eliminating physical boundaries. “The days of not knowing something are over” (Heick, 2012). Information needed by students or teachers is readily available and largely free online. On the positive side, teachers now have a greater wealth and depth of information from which to add to one’s repertoire. Additionally, information can be explored in real-time, three-dimensionally, and interactively. On the other side, some theories posit that instant access to such a vast amount of resources procures a lack of curiosity and investigation. “With answers readily available, students are less likely to use deductive reasoning skills or draw their
own conclusions” (Heick, 2012, par. 2). Yet, digital technologies have succeeded in easing physical boundaries thus creating a world undivided by terrain. Not only can students learn from each other from across vast miles, but also teachers are now instructing students separated by time or space.

To meet the needs of contemporary students, the New Media Consortium introduced a teaching model that incorporates the best elements of problem-based learning, project-based learning, and contextual teaching and learning, while also focusing on problems using research (Johnson, Smith, & Varon, 2009; Mooney & Edwards, 2001). This teaching model, as posited by The New Media Consortium, engages students’ curiosity and desire to learn (Laurence, Smith, Smythe, & Varon, 2009). Ultimately, this new model of instruction addresses what Prensky (2001) refers to as the single biggest problem facing education today: Digital Immigrant instructors, teachers who speak an outdated and pre-digital language, struggling to teach a population of students who are speaking a new digitalized language (Prensky, Digital Natives, Digital Immigrants, 2001). Educators of today must meet the needs of Digital Natives by learning their language and embracing their technologically-enhanced culture.

**Challenge Based Learning**

In an attempt to address today’s new educational needs, Apple Inc. is working with teachers and leaders in the education community to develop a new approach to teaching and learning. The approach developed in 2008, Challenge Based Learning, is an engaging multidisciplinary lens to teaching which begins with standards-based content, and then allows for students to leverage the content with technology already being used
in the students’ daily lives in an attempt to solve complex, real-world problems (Apple Inc., 2008; Johnson & Adams, 2011).

Challenge Based Learning is collaborative and hands on, asking students to work with other students, their teachers, and experts in their communities and around the world to develop deeper knowledge of the subjects they are studying, identify and solve challenges, make a difference in their community, and share their results with the world. (Apple Inc., 2010)

One feature that makes Challenge Based Learning unique is that the problems examined by the students are all linked to an idea of global importance. “Students are able to research the area of the challenge in terms of events taking place in the world around them, strengthening the connection between what they learn in school and what they perceive outside it” (Laurence, Smith, Smythe, & Varon, 2009, p. 8). Despite the need for relevance in students’ education, the link between what is learned in school and the knowledge need for life beyond is often absent (Johnson & Adams, 2011). Further, while striving to make the curricula relevant, Challenge Based Learning is also unique in that the practice calls for action. Students are not only required to complete the legwork necessary to attempt solving the chosen challenge, but these students go a step further by then implementing the solution. Whether or not the solution succeeds, it is not viewed as a failure nor an efficacious journey, but rather as part of the journey and learning experience itself.

Working in conjunction with others is yet another way by which Challenge Based Learning makes the curricula relevant to the everyday lives of the students. Teamwork
allows for students to hone many twenty-first century skills (such as decentralized
decision-making, information sharing, teamwork, and innovation) while the research
collaboration serves to reinforce the connection between that which is learned in school
and the students’ lives (Adams & Johnson, 2011).

Another exceptional feature of Challenge Based Learning is the amount of
freedom granted to the students. A hallmark of Challenge Based Learning is that, built
into the very framework of the initiative, students are provided with opportunities to be
creative and exhibit risk-taking behaviors. The encouragement and cultivation of
students’ creativity and risk-taking behaviors developed as a response to mounting
concerns within both the educational and business communities regarding the number of
high school graduates who struggle with abstract thinking skills, problem solving skills,
and the motivation and the discipline for self-directed learning, as well as fail to possess
the capacity to work well in conjunction with others (Adams & Johnson, 2011).

**Conceptual Framework**

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<td>Essential Questions</td>
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<td>The Challenge</td>
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<td>Guiding Questions</td>
<td>Guiding Activities</td>
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<td>Solution (Action)</td>
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<td>Assessment</td>
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<td>Publishing Student Samples</td>
<td>Publishing Student Reflection</td>
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Challenge Based Learning begins with a significant idea, or “big idea”
(EDUCAUSE, 2012), and then filters down to include the following (in sequential order):
the essential question; the challenge; the guiding questions, activities, and resources; determining and articulating the solution; taking action by implementing the solution; assessment; and finally, the publication. Throughout the process of Challenge Based Learning, reflection and information assessment are essential, as the two processes work to reinforce learning while simultaneously preparing the students for what is to come next.

The significant or big idea is a broad concept (e.g., identity, sustainability, creativity, violence, peace, or power) that can be explored in multiple ways, is engaging, and has importance to the students as well as the larger society – topics such as unemployment, immigration, or energy consumption (Apple Inc., 2009). Once the big idea is established, students generate essential questions that reflect their interests and the needs of their community. Ultimately, these essential questions need to identify what is important to know about the significant idea while also refining and contextualizing that idea (Apple Inc., 2009). Next, out of each essential question, students form the challenge that creates a specific answer or solution, resulting in further concrete, meaningful action. Following the challenge comes the forming of guiding questions that are generated by the students to represent the knowledge that they need to discover in order to successfully meet the challenge at hand. The guided activities (including, but not limited to, such forms as lessons, simulations, and games) come next and help students answer the guiding questions while setting the foundation for the students to develop innovative, insightful, and realistic solutions (Apple Inc., 2009). The focused set of guiding
resources (including podcasts, websites, videos, databases, and experts) are designed to support the activities and assist students with developing a solution (Apple Inc., 2009).

Solutions for each challenge are stated broadly enough to allow for a variety of thoughtful, concrete, actionable, clearly articulated resolutions which are presented in a publishable multimedia format (such as an enhanced podcast or short video) (Apple Inc., 2009). The solutions are then assessed for connections to the challenge, accuracy of content, clarity of communication, applicability for implementation, and efficacy of the idea (Apple Inc., 2009). Finally, since the challenge process allows for multiple opportunities to document the experience, students are encouraged to disseminate the challenge’s findings to a larger audience with the ultimate idea of broadening the learning community and fostering discussion regarding the solutions to the challenges that the students determine to be important (Apple Inc., 2009).

The role of teacher involvement in Challenge Based Learning shifts as the students progress through each stage. At the very beginning stage of Challenge Based Learning, during the introductory and challenge set-up phases, the teacher is responsible for decision making, communicating information, teaching skills, and answering questions (Apple Inc., 2010). During the interior stages of the Challenge Based Learning process, the teacher’s role shifts to project manager and mentor. At these middle stages, the teacher works alongside the students, but it is the learners who take charge of the planning and research needed to accomplish the task at hand. During the concluding stages of the Challenge Based Learning process, the teacher’s role is now product
Throughout the Challenge Based Learning process, students are provided with opportunities to create products which include, but are not limited to, the following: a challenge proposal video, a set of guiding questions, research plans and results, solutions with beta testing plans and evaluation parameters, a solution video, student journals, and individual reflection videos (Apple Inc., 2010). Since Challenge Based Learning requires real-world tools, students and teachers alike need ubiquitous access to technology commonly utilized in twenty-first century life and work (Apple Inc., 2010). Ideally, these real-world tools include such technologies as computers, rich media creation tools, the Internet, and mobile devices. Further, since Challenge Based Learning calls for collaborative efforts among students (none of which will take place within the boundaries of the traditional classroom), the cooperative workspace area will need to be accessible at all times (Apple Inc., 2010). Within the cooperative workspace area, a bare minimum of available tools should include a calendar, a place to store notes, documents, other digital assets (such as PDFs, video clips, and audio and video podcasts), Apple tools (including iWeb, iWork.com, MobileMe, and the resources included with Mac OS X Server Snow Leopard provide a set of tools for building a collaborative environment to support challenges), and Wikis, along with other free web-based tools which can be configured to work with classrooms and community groups (Apple Inc., 2010).

When working with Challenge Based Learning and the assessment of both the students’ learning and students’ final projects, emphasis is placed on the following three
areas: content knowledge and understanding, the mastery of real-world skills, and the process of Challenge Based Learning (Apple Inc., 2010). When preparing assessments of students’ learning, the teacher implements both informative (continuously throughout the process) and summative style testing (used to evaluate progress at checkpoints or at the conclusion) (Apple Inc., 2010).

Further consideration needs to be given to the evaluation of students on both the individual and group levels (Apple Inc., 2010). Some examples of student evaluations include traditional or district assessments used to determine subject and content knowledge, oral defenses, conference presentations, and job evaluations applied to the specific role played within the team (Apple Inc., 2010). At all times, students should be supplied with rubrics outlining the specificities of expectations (Apple Inc., 2010).

The Evidence of Challenge Based Learning

The first major study of Challenge Based Learning took place in the fall of 2009, when 321 students and 29 teachers in 6 US high schools embarked on a set of projects that spanned some 17 disciplines (Johnson & Adams, 2011). The outcomes of that study, conducted by the New Media Consortium, were significant on a number of levels, not the least of which was the clear efficacy of the approach (Johnson & Adams, 2011).

Evidence gathered from two major studies (involving 24 schools in 3 countries and 15 states, and more than 1,500 students and 90 teachers) advocates the effectiveness of Challenge Based Learning. According to the New Media Consortium (2011), Challenge Based Learning is one of the strongest ideas to emerge out of the current
educational climate while featuring replicable and scalable results for students at nearly every grade level (Johnson & Adams, 2011).

The purposes of the Challenge Based Learning Implementation Study were two-fold. The first purpose was to determine if the outcomes and findings of the pilot could be replicated and extended beyond the purely high school focus of the pilot to other educational levels and settings (Johnson & Adams, 2011). The second purpose was to increase understanding of several aspects of the school ecosystem that may influence the success of Challenge Based Learning (Johnson & Adams, 2011).

The four overarching findings of the Challenge Based Learning Implementation Study includes effectiveness in building twenty-first century skills, engaging students in learning, helping students to master the intended material, and appropriateness of technologically rich environments (Johnson & Adams, 2011). Most likely emerging during the analysis phase, the four main themes of the findings were formed by grouping responses under these general headers. In regard to effectiveness in building twenty-first century skills, 90% of teachers reported that the seven key skill areas (leadership, creativity, media literacy, problem solving, critical thinking, flexibility, and adaptability) improved significantly, while 70% of teachers reported some improvement in every area (Johnson & Adams, 2011).

Challenge Based Learning also successfully engages students in learning. Results from the Challenge Based Learning Implementation Study showed that over 75% of students, across all age groups, indicated that they learned more than what was required, were involved in solving a big problem, and worked at a higher level than usual (Johnson
Adams, 2011). Further, teachers felt that Challenge Based Learning was a much needed and refreshing change. Finally, Challenge Based Learning is best suited to teaching in technologically rich environments where every student has 24/7 access to computing resources at home and at school (Johnson & Adams, 2011).

Challenge Based Learning has not only been credited with considerable success at the K-12 levels (EDUCAUSE, 2012), the initiate has also affected higher education. Evidence of Challenge Based Learning in higher education projects spans across the nation. Full Sail University is currently conducting a Challenge Based Learning pilot aligned with the foster-care community, Ball State University is pursuing efforts to initiate community engagement in ethanol fuel production, and Kansas State University actively uses Challenge Based Learning in a Technology for Teaching and Learning course (EDUCAUSE, 2012). Reed College held a Challenge Based learning pilot of their own (Marmarelli & Ringle, 2011). With the goal of exploring the potential of tablet technology within the faculty teaching practices, 21 Reed faculty members were provided an allowance toward the purchase of an iPad (Marmarelli & Ringle, 2011). Ultimately, the iPad “received glowing remarks for its performance in college classrooms” (Ferenstien, 2013, par. 1).

Critics’ Interpretations of Challenge Based Learning

To meet the challenges of tomorrow, educators will have to rethink “how they do business” (Fischer, 2011, par. 18). “Computers are reshaping children’s lives, at home and at school, in profound and unexpected ways; common sense suggests that we consider the potential harm, as well as the promised benefits, of this change” (Alliance
for Childhood, n.d., p. 3). The Alliance for Childhood is an international movement comprised of educators and other activists who have been moved to action through a shared concern regarding "the plight of children today" (Alliance for Childhood, n.d., p. 1).

Members of the Alliance for Childhood believe that the only means by which a significant difference can be made in the lives of children is by working together in a partnership of individuals and organizations (Alliance for Childhood, n.d.). Main concerns and fundamental beliefs belonging to the members of the Alliance include:

- Childhood is a critical phase of life and must be protected to be fully experienced. It should not be hurried.

- Each child deserves deep respect as an individual. Each needs help in developing his or her own unique capacities and in finding ways to weave them into a healthy social fabric.

- Children today are under tremendous stress and suffer increasingly from illnesses such as asthma, hyperactive disorders, depression, and autism. This stress must be alleviated.

Many critics of technology in the classroom, as well as those opposed to Challenge Based Learning strategies, contest that when technologies are introduced into the classroom, the focus of learning shifts to one that no longer institutes a learning revolution (Fryer, 2010). In fact, some critics call the presuppositions of such initiatives into question: "It's not about fundamentally changing education, it's about trying to simply shift educational decision maker attention to Apple products so that quarterly
profits can go up yet again” (Fryer, 2010, par. 12). Despite speculation that the goal of increased profit shares somehow nullifies the positive educational effects of technologically based school initiatives, a vast majority of studies are funded by the very companies and institutions that have created and promoted the technology, indeed raising questions of the research’s validity and objectivity (Education Week, 2011).

Aligned with the thoughts of Fryer (2010), the findings reposted by Education Week (2011) comment that “while there is much on-going research on new technologies and their effects on teaching and learning, there is little rigorous, large-scale data that makes for solid research” (Education Week, 2011). Mainly, the reason for the lack of large-scale data is that the rapid evolution of educational technologies also makes it increasingly challenging to determine what works best (Education Week, 2011).

“Longitudinal research that takes years to do risks being irrelevant by the time it is completed because of shifts in the technological landscape” (Education Week, 2011, par. 4). As is typically the case for most educational technologies, the iPad is one example of technology being utilized in schools well before any research could be conducted about its educational effectiveness (Education Week, 2011).

The most frequent counter-argument to the practices embedded into the everyday practices of Challenge Based Learning is the focus of technology used in the classrooms. Apple claims to offer everything that a student could possibly need to tackle any challenge (Apple Inc., 2011). The company further asserts that through the use of the Apple technology, students are connecting more deeply with the learning content being presented in today’s schools (particularly those schools presently practicing Challenge
Based Learning) (Apple Inc., 2011). However, according to one of the Alliance for Childhood’s most recent publications, computers not only pose serious health threats but also are diverting scarce resources from children’s real unmet needs (Alliance for Childhood, n.d.). The Alliance for Childhood (n.d.) listed some of the school-aged students’ unmet needs that include, but are not limited to, reducing classroom size, raising teachers’ salaries to attract and retain good teachers, funding the aides, counselors, and other adult mentors that children need, and repairing and renovating dilapidated school buildings (Alliance for Childhood, n.d.). Additionally, 43% of all public schools in the US reported a minimum of one environmental problem, such as poor ventilation, inadequate heating, and poor indoor air quality. Finally, according to a 1995 report put out by the U.S. General Accounting Office, two-thirds of these U.S. public schools needed renovations to correct health, safety, or accessibility problems, such as removing asbestos, lead in water or paint, or problem materials in underground storage tanks (U.S. General Accounting Office, 1995).

Additional arguments against Challenge Based Learning posit that the budgetary requirements to maintain a technologically-centered classroom far surpass the available monies. U.S. public schools have spent more than $27 billion on computer technology and related expenses on the last five years, and this number is on the rise (Alliance for Childhood, n.d.). But the price of leveraging computer technologies in the classroom does not only come at a monetary costs but also in the form of opportunities lost to meet children’s far more pressing needs (Alliance for Childhood, n.d.).
A machine-centered approach does not meet the developmental needs of grade-school children. Nor will it prepare them to muster the human imagination, courage, and will power they will need as adults need to tackle the huge social and environmental problems looming before them. In the long term, what will serve students far better is a firm commitment from parents, educators, policymakers, and communities to remarkable low-tech imperatives of childhood. Those include good nutrition, safe housing, and high-quality health care for every child. (Alliance for Childhood, n.d.)

The University-Apple Collaboration

Today’s leaders are facing challenges and changes that rapidly transform where, how, and with whom they interact (Wilverding, 2008). “An anticipatory workforce—one that thrives on innovation—will be an essential determinant of future success” (Wilverding, 2008, p. 11), and, therefore, present efforts to review and revamp general education requirements are extensive (Berrett, Ramping Up Rigor, 2011). In fact, of the academic officials at the 433 colleges nationwide who were surveyed by the Association of American Colleges and Universities (AAC&U), 89% claimed to be in the process of reviewing or modifying general education requirement offerings at their respective school (Hart Research Associates, 2009).

The University is among those educational institutions taking steps to increase academic rigor, sharpen students’ critical thinking and analytical reasoning, and expose students to richer subject matter. Following the 2006 appointment of a new president, the
University administration and trustees adopted a strategic learning plan that raised the expectations for what University students should learn (Berrett, Ramping Up Rigor, 2011). The plan is rooted in the liberal arts; "the centerpiece that emerged is a very prescribed core curriculum with one set of reading materials, common assignments and assessments, and explicit target for the amount of reading and writing students must do" (Berrett, 2011, par. 3). Yet a larger goal was also set into place, a goal aiming to change more than just the expectations of the students but also to alter the orientation of the faculty and the college culture (Berrett, Ramping Up Rigor, 2011).

Senior leadership at the University recognized that Apple’s innovative technologies have the potential to transform curricula using Challenge Based Learning. As is the case here, the mission for many critical educators centers on efforts to displace any model of pedagogy that limits the efforts of learners to imagine, to hope and to aspire as creative and critical agents (Wilkins, 2013). "Learners can only come to appreciate the empowering and transformative effects of knowledge through playing an active role in the struggle to define and validate its application and utility in the world" (Wilkins, 2013, p. 3). The Challenge Based Learning pilot at the school favored a model of knowing, learning, and teaching that works to sustain practices of critical inquiry and self-discovery among learners as active, reflexive, and engaged subjects.
CHAPTER III

METHODOLOGY

Chapter III identifies the methods used to answer the research question exploring to what extent would the 16 faculty members want to employ Challenge Based Learning in other courses. This chapter describes the research question, the research design, population and sampling plan, setting, instrumentation, procedures, methodologies, and methods of data analysis.

The Research Question

Evolving from the University’s 2020 Strategic Plan (Lynn University, 2005), which set forth a goal to make the university one of the most innovative educational facilities in the U.S., research question asks: To what extent do the University faculty members want to employ Challenge Based Learning in their courses. The researcher was charged with the task of finding the answer to the question: To what extent do the University faculty members want to use Challenge Based Learning the other courses that they will teach in subsequent terms at the University.

Research Design

The research design is a mixed methodology, action-research study, used to examine the extent to that the University faculty want to employ Challenge Based Learning in other courses.

Action Research.

Action research, also known as participatory research, collaborative inquiry, action learning, and contextual action research, means “learning by doing” (O’Brien,
2001). By incorporating a social dimension, action research allows the study to take place in authentic “real-world” situations while aiming to solve real problems (O'Brien, 2001). Different from other research disciplines, in action research, the initiating researcher “makes no attempt to remain objective, but openly acknowledges their bias to the other participants” (O'Brien, 2001, par. 6). As in the case of this study, “[action research] can… be used by social scientists for preliminary or pilot research, especially when the situation is too ambiguous to frame a precise research question” (O'Brien, 2001, par. 16).

Action research is commonly divided into four main streams: traditional, contextual, radical, and educational action research (Hien, 2009). This action research study falls under the category of educational action research. With foundations in the writings of Dewey, educational action research mainly operates out of educational institutions while focusing on development of curriculum and professional development, and applying learning in a social context (O'Brien, 2001).

Dr. Stephen Kemmis, a research professor in the School of Education at the Charles Stuart University, describes the action research process in a cyclical model consisting of four steps: plan, act, observe, reflect (O'Brien, 2001). The action research model employed in the present study relies on these four distinct action stages (Strategize, Apply, Evaluate, and Reflect) to investigate various aspects based on the core investigative criteria.
Population and Sampling Plan

Target Population.

During the 2011-2012 school year, there were 151 faculty members teaching at the University (College Crunch, 2013). The researcher has no knowledge of the members that comprise the University’s selection committee, nor will the researcher be made privy to any additional inclusion or exclusion criteria used in the selection process.

Sampling Plan.

In the case of the Challenge Based Learning pilot, the researcher of the University’s pilot asked an administrator working at the University to identify the 16 faculty members pre-selected to become members of the sample. A committee comprised of that reviewed pool of volunteer applicants selected these 16 faculty members. The final data-producing sample consisted of 16 faculty members. To begin with, the entire University faculty was asked to submit their name to an executive committee if they were interested
in participating in a Challenge Based Learning pilot. Out of the members who submitted an entry, 16 people were chosen.

**Inclusion Criteria.** To be eligible to participate in this study, respondent had to:

1. Be university full-time faculty
2. Teach a course in the 2012 Citizen Project during the January-term courses
3. Have applied to participate in the pilot
4. Be chosen from the group of applicants to participate in the research study
5. Agree to participate in the Challenge Based Learning Pilot

**Exclusion Criteria.** Individuals falling into any of the below categories were automatically removed from the sample

1. Non-university employees
2. University employees who were not teachers
3. University instructors who were not full-time
4. University instructors not teaching undergraduate classes during the 2012 January-term
5. University instructors not teaching a course in the 2012 Citizen Project

**Setting**

The research study took place on the campus of a university in the state of Florida. Founded in the early 1960s, the University remains a private, nonprofit, educational institution (Lynn University, 2012). Accredited by the Commission on Colleges of the Southern Association of Colleges and Schools, the University is school to
1,660 undergraduate students and 449 graduate students, and features a 16:1 faculty to student ratio (Lynn University, 2012).

"J-Term is a two-and-a-half week mini term where students learn in unconventional, exciting and often experiential ways" (Laura, 2012). The University’s fourth annual J-[for January]-Term (Laura, 2012) marked the inaugural launch of the Citizenship Project (Stephens, 2011), requiring all first-year undergraduate students to take one of 22 courses in the Dialogues of Innovation (Stephens, 2011).

**Instrumentation**

An instrument is a means used to study an event (Weiss, 1998, p. 332). The instruments used to explore the extent to which the faculty members want to use Challenge Based Learning in other courses are two surveys which include a pre-survey (see Appendix A) and a post-survey (see Appendix B).

The researcher designed the pre-survey instrument which was comprised of 16 total questions, 13 multiple-choice questions and 3 open ended questions. The pre-survey was administered, in person, to all 16-faculty members during the October 07, 2011 focus group. The pre-survey instrument used consisted of four parts (see Appendix A). **Part I:** *Teacher Characteristics* measured demographic variables of gender, ethnicity, work profile, technological exposure, and experience with digital technologies.  **Part II:** *Teachers’ Ability to Perform Various Technological Activities* measured a faculty member’s present ability to perform various tasks using different digital and mobile technologies. Such tasks include the following: conduct research on the Internet; create and share images and video; utilize cloud computing tools and technologies; manipulate
social media outlets like Facebook, Flickr, and Picasa; use programs such as Excel, PowerPoint, and Word 2010; use Twitter; and use a smart phone for more than talking.

*Part III: Challenge Based Learning* will consist of two parts: a quantitative question inquiring into the faculty member’s prior exposure to Challenge Based Learning, and a qualitative open-ended question asking the faculty member to write about what the teacher knows about Challenge Based Learning. *Part IV: iPad Use* instructs each faculty member to write about how the iPad will be used in his or her classroom. Additional questions seek to establish which applications will be programs will be immediately installed onto the iPad and how those applications will be used.

The researcher designed the post-survey instrument used for this study. Out of 13 total questions, 4 were multiple choice questions, 1 was a Likert scale question, and 8 were open-ended questions. The post-survey was emailed to all 16-faculty members via provided University email addresses and completed forms were returned, via email, to the researcher. The post-survey instrument consisted of seven parts (see Appendix B). *Part I: Overall Technological Ability*, as developed by the researcher, measures each participant’s assessment of his or her own ability to utilize digital technologies. *Part II: Previous iPad Ownership* measured prior iPad ownership against present iPad ownership. *Part III: Time Spent Using iPad* measured the amount of time each faculty member spends using his or her iPad. *Part IV: Rating of Specific Abilities* consists of eight multiple-choice questions which asks the survey-taker to rate his or her ability to perform specific digital technology-related tasks. The answer options were they based on a four-point Likert scale, from having no knowledge or ability to rating oneself as a high-
level user. Tasks listed included the ability to conduct research on the Internet; to create, edit and share images and video; to use cloud computing tools; to use online media options like Facebook, Flickr or Picasa; to use the Microsoft Office suite (Excel, PowerPoint, and Word); to use Mac-based Apple-developed programs such as Keynote, Numbers, or Pages; to use Twitter; and to use smart phones for more than talking. *Part V: Previous Knowledge of Challenge Based Learning* asked each of the 16 faculty members if he or she had ever heard of Challenge Based Learning prior to the introduction made via this pilot. Part VI of the survey will consist of seven open-ended questions where the subject is asked to write a response on blank lines provided on the survey form. The questions measured present knowledge regarding Challenge Based Learning, iPad use in classroom, specific application use and installation onto the iPad, positive outcomes in iPad experience as related to the classroom, negative outcomes in respect to personal classroom iPad use, description of personal experiences as relating to iPad classroom use, and considerations for Challenge Based Learning in future course assignments. *Part VII: Additional Comments* will encourage the survey-taker to write any additional comments, thoughts, insights, or feedback.

**Procedures**

The University launched an iPad pilot program for faculty that included Challenge Based Learning as an assignment model in 16 J-Term courses, 13 of which are variations on our QEP (Quality Enhancement Plan), the Citizenship Project (Lynn University, 2011b). Upon invitation to monitor the pilot, the outside researcher’s role was to implement the action research method. The action research was employed in such
a manner as to produce a mutually agreeable outcome for all participants, with the process being maintained by the stakeholders thereafter. In order to successfully implement the action research process, the researcher adopted several different roles at various stages of the process. These roles included listener of feedback, observer of experiences, reporter of statistics, and designer of the methodological approach used. The researcher’s main role in this project was to determine the extent to which the faculty used in the pilot employ to use Challenge Based Learning in other courses.

During the pilot, the 16 faculty members received instruction regarding how to implement Challenge Based Learning in their classrooms. Throughout the duration of the University pilot, participants were expected to evaluate the use of the iPad as an educational tool from the perspective of instructors, and were expected to experiment with using the iPad as both a learning and administrative tool. More specifically, the 16 faculty members were asked to seek out applications and uses of the iPad that will help improve teaching effectiveness.

Data Collection

Surveys.

As a means by which to collect information directly from each of the 16 faculty participants in the most systematic and standardized way, two separate surveys (a pre-survey and a post-survey) were authored, distributed, collected, and analyzed by the researcher. The decision to use surveys, a means by which to ask the same question in the same way during the same timeframe (Taylor-Powell & Hermann, 2000), was originally the researcher’s, and after conferring with an executive member of the
University staff, the choice of two surveys was approved and permission was granted to proceed with the authoring.

Since all 16-faculty members would already be convened at the first Challenge Based Learning meeting held on October 07, 2011, the researcher opted to compose hand out surveys. Hand out surveys are ideal for providing immediate evaluative feedback (Taylor-Powell & Hermann, 2000) that would then be used as a base-line measure by which to assess areas of change. Other reasons why the researcher choice to use hand out surveys include the opportunity to personally convey the purpose and the importance of the survey to the respondents, and the ability to answer any questions that the respondents may have. Finally, research suggests that most people are more likely to consent to completing a survey when asked in person (Taylor-Powell & Hermann, 2000). Having all 16-faculty member's consent to complete the survey was essential for reasons of ethical consideration and for purposes of informed consent. "The informed consent process involves three key features: (1) disclosing to potential research subjects information needed to make an informed decision; (2) facilitating the understanding of what has been disclosed; and (3) promoting the voluntariness of the decision about whether or not to participate in the research" (U.S. Department of Health & Human Services, 2013, par. 3). All three factors were taken into consideration by the researcher and informed consent was legally and prospectively obtained verbally.

Pre-Survey.

The pre-survey was handed to each of the 16 faculty members at the beginning of the first meeting that took place on October 7, 2011. This hand out pre-survey was
conducted using a pen and a pre-written survey form, both of which were provide to each of the 16 faculty respondents by the researcher. Faculty were provided with 30 minutes to complete the survey before the commencement of the first Challenge Based Learning information and training session. Upon completion, the researcher collected the 16 surveys and stored the forms as a future resource.

**Post-Survey.**

The post-survey was distributed via email by a member of the school’s executive committee to each of the 16 faculty members sometime after the completion of the final training session that took place on December 14, 2011. The exact date that the post-survey was distributed was never disclosed to the researcher. Digital copies of the completed surveys were provided to the researcher upon the completion of the pilot study on December 14, 2011.

**Training Sessions**

During the summer of 2011, the University’s senior management visited the Apple, Inc. headquarters in Cupertino. The purpose of this trip was to attend both a briefing on Challenge Based Learning and to explore areas where Apple’s technologies could enhance the student learning experience. Among the outcomes of the information and brainstorming sessions was the decision to have Apple specialists travel to the University and conduct a pilot coupling iPads and Challenge Based Learning. These Apple specialists first traveled to the University in October of 2011, during which time the 16 preselected University faculty members were taught how to implement Challenge Based Learning into their classroom. In the training, the 16 faculty members each
received an iPad along with hands-on training in applications and Challenge Based concepts. Such concepts taught included: coming up with the big idea, narrowing to the essential questions, committing to the challenge, reflections from students and faculty, attainable solutions, documenting evidence via creative videos and assessment which occurs at regular intervals throughout the process. The research attended all training sessions.

**Session 1: October 07, 2011.**

On October 7, 2011 (11:30am – 2:00pm), all full-time faculty working at the University were required to attend a mandatory two-and-a-half hour meeting that would serve as an introduction to Challenge Based Learning. The meeting, led by three Apple executives flown in from the Apple, Inc. headquarters in Cupertino, California, took place on the University’s campus from 11:30am through until 2:00pm.

**Session 2: October 10, 2011.**

On October 10, 2011 (11:00am – 3:00pm), the University’s Director of Instructional Technology, 3 Apple representatives from Cupertino, the researcher, and the 16 pilot faculty members, all attended a second meeting on the University’s campus. The purposes of the second meeting were: (1) to administer the pre-survey to the 16 faculty members, (2) to reintroduce the broad concepts of Challenge Based Learning to the 16 faculty members, (3) to build upon concepts introduced in the first information meeting (held two days prior), and (4) to answer any questions that the faculty members may have regarding either Challenge Based Learning or the proceeding of the pilot study. The aforementioned steps occurred in the described respective order.
Session 3: October 27, 2011.

On October 27, 2011 (8:30am – 5:00pm), the 16 faculty members plus 2 Apple representatives met for a third time. The meeting began at 8:30am and lasted until 5:00pm. Prior to the third meeting, the 16 faculty members were expected to have already experimented with and familiarized themselves to the basic working functions of the iPad. Such basic working functions included how to power-on the device, how to charge the device, and how to manipulate the touch-screen. All of the aforementioned skills were revisited and reviewed at the start of the meeting. Questions were taken and answers, instructions, and techniques were supplied. The research took observational notes throughout the process.

Session 4: December 15, 2011.

On December 15, 2011 (noon – 2:00pm), the 16 University faculty members met on the University’s campus for a forth meeting. At this meeting, the 16 participants were asked to use their iPad and complete a Challenge Based Learning activity of their own. The 16 faculty member were arbitrarily divided into four smaller group (each group consisting of 4 members). Each of the four groups were assigned the same task: to follow the steps that comprise Challenge Based Learning. Ultimately, each group created a video and shared the end-product (a video) with the other three groups.

Session 5: December 14, 2011.

January 20, 2012 was the J-Term post-meeting where students and faculty shared the Challenge Based Learning end-products, videos created using Challenge Based Learning and iPads to explore the topic of citizenship.
Data Analysis

The pre-survey (Appendix A) consists of 22 questions: 10 demographic questions, 9 quantitative questions, and 3 qualitative. The first 10 questions will define sex, ethnicity, years teaching at the school, number of classes being taught at the school during the Fall 2011 term, and specific digital technology possessions (desktop computer, laptop, mobile Apple technology device, etc.). A frequency analysis will be applied to the answers collected from questions 11 through 14, which will all be quantitative in nature. Question 11 will ask about the amount of time per week spent using a computer at school. Question 12 will consist of seven parts, all of which will assess user-defined levels of ability when performing tasks such as conducting research on the Internet, using cloud technologies, and using social media platforms including Twitter and Facebook. Each answer will be ranked on a one-through-four scale, where one equals no ability and four denotes a high-level user. Concluding questions will be qualitative and will provide room for respondents to write answers. Question 14 will ask the pilot member to write what he or she already knows about Challenge Based Learning. Question 15 will ask the faculty member to write about plans to use the iPad in his or her classroom. Question 16 will provide four spaces to write about which applications will be installed onto the iPad immediately in addition to how those applications will be used.

Post-Survey.

The post-survey consist of 13 questions, with the first 5 questions to be quantitative and the following 8 questions to be qualitative. A frequency analysis will be applied to the answers collected from questions one through five. The first question will
ask the respondent to rate his or her own overall ability to use technology. The four optional answers provided will range from the ability to use technology without assistance to the need for assistance. Questions 2 will ask about prior iPad ownership. Question 3 will ask faculty to rank the time per week spent using the iPad. Answers will range from less than 15 minutes to more than 10 hours. Question 4 will consist of eight parts, with a choice of answers ranging from no ability to high-level user. These eight parts will cover the same skills assessed in question 12 of the pre-survey; comparisons will be made and any changes in answer will be noted. The fifth question on the post-survey will parallel question 13 on the pre-survey, asking whether the faculty member had ever heard of Challenge Based Learning prior to October 7, 2011. The remaining eight qualitative questions will be in an open-ended format and will ask the respondents to write responses. Question 6 will ask what the respondent knows about Challenge Based Learning. A comparison will be made between post-survey question number six and pre-survey question number 14, and any change of answer will be noted. Question 7 will ask how the faculty member used the iPad in classes, so that patterns can be drawn and a comparison can be made between the answer and the answer provided in the pre-survey question number 15 that asked the faculty member to forecast use of the iPad in classes. Questions 9 through 11 will ask the faculty to expand upon the experience of using the iPad for classes, emphasizing both a positive and a negative outcome of the experience in addition to an overall description. Post-survey question 12 will ask the faculty if he or she would consider using Challenge Based Learning in future courses, and question 13 will provide space for any additional comments.
CHAPTER IV

FINDINGS

Twenty-first century technologies have brought about a shift in the learning paradigm, and “education no longer means the same thing as it did in the past” (Prensky, 2007, p. 1). As we begin the 21st century, most counties in the world are shifting from a manufacturing- to a service- and information-based economy (Spanier, 2010). This information-based economy allows for the free accessibility of information in order to facilitate knowledge transfer across borders to different people (Tapscott, 1996).

In order to meet the demands being placed on today’s academic institutions, the University would need a faculty support structure that would provide assistance on technical issues, instructional design concerns, and delivery techniques. This support structure would need to be tested. Therefore a pilot comprised of 16 University faculty members was designed at the University. During the pilot, survey data were collected. The goal of performing survey research was to assess the extent to which the faculty would support a University-wide implementation of Challenge Based Learning into everyday classroom practices. Before initiating Challenge Based Learning university-wide, the 16 chosen sample members would perform a test pilot during an abbreviated academic term, called a “J-Term.” Two surveys, (a pre-survey and a post-survey), were completed by each member of the sample (n=16). Data collected from the pre-survey were analyzed by means of quantitative analysis, and a frequency chart was completed. Qualitative data were analyzed by means of binning and coding, then identifying domains
that illustrated patterns, themes and discrepancies. This chapter presents the findings of a mixed methodology study defined in terms of patterns, themes, and discrepancies.

**Summary of Results**

The University administrators were curious if the University faculty would support implementing Challenge Based Learning in all University classroom teaching. To what extent do the University faculty members want to use Challenge Based Learning in the other courses they will teach in subsequent terms at the University?

The sample used was composed of 16 full-time University faculty members (n=16). Nine of the faculty members (56.25%) were female and seven faculty members (43.75%) were male. Of the females, eight were White, non-Hispanic, and one was African American. Of the males, six were White, non-Hispanic, and one was Native American. For the total sample of both female and male participants, there were 13 White, non-Hispanic members (81.25%), one member was Native American, one member was African American, and one member was multi-ethnic (see Figure 2).
Figure 2. Ethnicity of sample, by gender.

By October 7, 2011, when the pre-survey data were collected, each member of the sample had worked at the University for a minimum of three years, with 10 of the 16 members (62.5%) having worked at the University for more than five years. More than half of the sample (68.75%) taught at least four classes at the University during the Fall 2011 term. Of the remaining five members, three members taught three classes during the Fall 2011 term, and two people taught one class each (see Figure 3).
In respect to personal ownership, 25% of the sample members did not own a desktop computer at home at the time that the pre-survey data were collected. Of the 11 members who did own home desktop computers, all but one member worked off a Windows-based platform. One member owned a MAC desktop computer at home. One member did not answer the question. Thirteen of the 16 (81.25%) sample members owned personal laptop computers. Of those members who did own laptops, two people reported bringing the devices to and from work. Both people who reported bringing laptops to work (one male and one female) owned Windows-based devices. The number

\[\text{Figure 3. Number of classes taught at the University during Fall 2011 term.}\]
of members who owned at least one form of home computer device was 93.75%, with 75% of members owning at least a desktop computer and 87.5% of the members owning at least a laptop computer. A total of 68.75% of the sample members owned both a laptop computer and a desktop computer. One male (6.25% of the same population) did not own any form of home computer (see Figure 4).

**Personal Computer Ownership**

<table>
<thead>
<tr>
<th>Technology Owned at Home</th>
<th>Windows</th>
<th>MAC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Desktop</td>
<td>10</td>
<td>1</td>
</tr>
<tr>
<td>Laptop</td>
<td>13</td>
<td>1</td>
</tr>
</tbody>
</table>

*Figure 4. Personal computer ownership.*

Other computing technology owned by members included iPhones (31.25% of the sample) and iPads (25% of the sample) (see Figure 5).
Figure 5. Personal technology ownership.

Description of Results

The research question examined the extent to which the University faculty members want to use Challenge Based Learning in the other courses that they will teach in subsequent terms at the University. The extent was not only measured in totality, but also the change in extent from pre-survey to post-survey was assessed. In an attempt to establish a baseline measure against which to compare change over the 2½-week pilot, each member of the sample was asked to rate themselves on overall ability to use technology (Question 3: How would you rate your overall ability to use technology?). One member of the sample rated himself as needing a lot of assistance when using technology, and the remaining 15 members were split between needing minimal assistance when using technology (n=8) and those not needing any assistance (n=7).

Each member’s abilities to perform specific tasks were also assessed (Questions 12, a-g: Circle the appropriate number to rate your ability to perform a specific task).
Questions regarding each sample member’s performance ability were ranked on a Likert scale, ranging from one (no knowledge/ability) to four (high-level user). All 16 sample members claimed to be high-level users in respect to conducting research on the Internet (Question 12, a: Circle the appropriate number to rate your ability to...conduct research on the Internet).

Another task assessed was the ability to create and share images and videos (Question 12, b: Circle the appropriate number to rate your ability to...create and share images and video). Although one sample member possessed no such knowledge, 10 members (62.5% of the sample population) claimed to be of a high-level ability when performing these tasks. Out of the remaining five sample members, four members ranked just below a high-level ability and one member ranked at the novice level.

Members’ ability to use cloud-computing tools was also assessed (Question 12c: Circle the appropriate number to rate your ability to...use cloud-computing tools). Out of the 14 members who answered the question, three people were advanced users of cloud computing, three members possessed no knowledge of cloud computing, and the remaining eight members were split in-between. Another question asked members to rank their abilities to manipulate social media networks (Question 12, d: Circle the appropriate number to rate your ability to...use Facebook, Flickr or Picasa). Although one member did not answer the question, and one member had no knowledge of how to manipulate specific social media programs, the remaining 11 members possessed at least a basic understanding of how to use Facebook, Flickr or Picasa. Specifically, five members believed themselves to be high-level users of Facebook, Flickr or Picasa, four
members ranked just below advanced, and the remaining two members had a basic understanding of at least one of the aforementioned programs. Ten members had no knowledge of how to use Twitter (Question 12, f: Circle the appropriate number to rate your ability to...use Twitter). Out of the remaining six members, only one member was knowledgeable about Twitter, while the other four members were evenly split between novice and intermediate users.

Additional questions included in the pre-survey pertained to the Microsoft Office Suite: Excel, PowerPoint, and Word 2010 (Question 12, e: Circle the appropriate number to rate your ability to...use Excel, PowerPoint, and Word 2010). One hundred percent of the sample members were able to successfully use Excel, PowerPoint, and Word 2010 programs, and 11 members (66.75%) ranked as high-level users. Out of the remaining five members, four members ranked as just below high-level. While four members of the sample did not use personal smartphone for more than talking (Question 12, g: Circle the appropriate number to rate your ability to...use smartphone for more than talking), 75% of the sample members did. Of the 12 members who did use a smartphone for more than talking, half were considered high-level users.

The next area addressed in the pre-survey was sample members’ computer habits. All of the sample members claimed to spend a weekly average of at least two-to-five hours using a computer while at the University (Question 11: On average, about how much time per week do you spend using a computer at school?), while 10 members (62.5% of the sample population) used a computer at the University at least 10 hours a week at the time that the pre-survey was administered.
Members' knowledge about Challenge Based Learning was ranked on a 4-point Likert scale, with one equaling 'very familiar' and four equaling 'no [knowledge].' At the time that the pre-survey was administered, four of the sample members (25%) had never before heard about Challenge Based Learning, while another four members (25%) had heard of Challenge Based Learning but knew nothing more. Half of the members (50%) of the sample population were somewhat familiar with Challenge Based Learning and two people were very familiar with the topic (see Figure 6).

![Familiarity with Challenge Based Learning](image)

**Figure 6.** Familiarity with Challenge Based Learning (pre-survey data).

The post-survey provided the measures against which the pre-survey was compared. For this reason, several of the same questions appear on both instruments. In
the following section, the answers to the post-survey questions are provided, alongside comparisons to the pre-survey data.

Prior to September of 2011, 31.25% (five members) of the sample population owned an iPad (post-survey, Question 2: Prior to September, did you have an iPad?). For the duration of the study, all 16 sample members were provided with a free iPad. The hours per week that sample members spent using the iPad (post-survey, Question 3: On average, about how much time per week do you spend using your iPad?) varied. Although all 16-sample members claimed to use the iPad a minimum of 30 minutes per week, the average sample member used the iPad for two-to-five hours per week. The following chart illustrates the trend in hours per week that sample members spend using an iPad (see Figure 7).

![Time Per Week Spent Using iPad](image)

Figure 7. Time per week spent using iPad.
In respect to overall ability to use technology at the time that the post-survey data were collected on December 14, 2011 (post-survey, Question 1: How would you rate your overall ability to use technology?), all 16 sample members could use technology with minimal assistance needed. Of those 16 members, 25% (4 members) needed no assistance at all when using technology. Question 1 on the post-survey (How would you rate your overall ability to use technology?) corresponds to Question 3 on the pre-survey (How would you rate your overall ability to use technology?). A comparison of the data between the two questions is illustrated in Figure 8.

![Overall Ability to use Technology](image)

**Figure 8.** Overall ability to use technology.

A four-answer Likert scale was used to rate the post-survey data collected on members’ abilities to perform specific tasks (post-survey, Question 4: Circle the appropriate number to rate your ability to perform each of the following [tasks]). The
specific tasks addressed were Internet-based research, image editing and sharing, cloud computing, social media, word processing programs, and smartphone use. The scale used ranged from one, indicating members with no knowledge or abilities, to four, describing high-level users.

According to post-survey data, fifteen of the sixteen sample members (93.75%) ranked as high-level users when conducting research on the Internet. When comparing the post-survey data (Question 4, a: Circle the appropriate number to rate your ability to...conduct research on the Internet) to the pre-survey data (Question 12, a: Circle the appropriate number to rate your ability to...conduct research on the Internet), there is a 6.25% decline in the members that were able to conduct research on the Internet. This decline is the result of one sample member who had previously ranked as a high-level user but, after the pilot, ranked one level below a high-level user. Despite varied sample members’ abilities to create, edit, and share images and video, half (50%) of the sample population ranked as high-level users on the post-survey. Out of the remaining eight members, five members ranked just below high-level users, two members ranked as novice users, and one member did not answer the question. Although there is a two member (12.5% of the total sample population) decline in the number of high-level users from the pre-survey to the post-survey, Figure 9 illustrates the overall positive trend in growth of ability during the pilot study.
Sample members’ ability to use cloud-computing tools (post-survey, Question 4, c: Circle the appropriate number to rate your ability to...use cloud computing tools) was assessed on the post-survey. As illustrated in Figure 10, the faculty members’ overall levels of confidence in their own ability to use cloud-computing tools declined from the pre-survey to the post-survey.
While their confidence in their abilities regarding image manipulation and cloud-computing activities featured declining trends, faculty members believed that their abilities to utilize social media networks (such as Facebook, Flickr or Picasa) remained constant. This trend is demonstrated in Figure 11, where the data from the post-survey Question 4, d (Circle the appropriate number to rate your ability to...use Facebook, Flickr or Picasa) and the data from the pre-survey (Question 12, d: Circle the appropriate number to rate your ability to...use Facebook, Flickr or Picasa) form parallels. In both

**Figure 10.** Ability to use cloud-computing tools.

<table>
<thead>
<tr>
<th>Number of Sample Members</th>
<th>Pre-Survey</th>
<th>Post-Survey</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (No Knowledge/Ability)</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>2 (Beginner User)</td>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td>3 (Experienced User)</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>4 (High-Level User)</td>
<td>3</td>
<td>1</td>
</tr>
</tbody>
</table>
instances, the members of both high-level ability users and novice users remained constant.

Figure 11. Ability to use Facebook (a social-networking community), and Flickr or Picasa (both of which are online image manipulation and sharing platforms).

The sample members’ ability to use the Microsoft Office Suite was strengthened from the time of the pre-survey to the post-survey. Whereas 11 members (68.75%) of the sample were high-level users at the time of the pre-survey data collection, 14 members (87.5%) were high-levels users at the time of the post-data collection. According to the post-survey data, the remaining two members of the sample ranked one level below the high-level users in respect to their ability to use Microsoft Office Suite programs. Similar to the programs featured in Microsoft’s Office Suite are the Apple iWork programs (Keynote, Numbers, and Pages). Post-survey data suggests that the sample
members were more confident with their abilities to manipulate the Microsoft Office Suite software package than the comparable Apple iWork programs. Figure 12 illustrates the differences between user ability with respect to these two software bundles.

<table>
<thead>
<tr>
<th>Ability Level</th>
<th>Microsoft (Excel, PowerPoint, or Word 2010)</th>
<th>Apple iWork (Keynote, Numbers, or Pages)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (No Knowledge/Ability)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2 (Beginner User)</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>3 (Experienced User)</td>
<td>2</td>
<td>9</td>
</tr>
<tr>
<td>4 (High-Level User)</td>
<td>14</td>
<td>4</td>
</tr>
</tbody>
</table>

**Figure 12.** Differences in user abilities for two software packages: Microsoft Office Suite and Apple iWork Package.

Since Twitter may be used in conjunction with iPads and Challenge Based Learning, the study addressed user confidence in utilizing Twitter (post-survey, Question 12, g: Circle the appropriate number to rate your ability to...use Twitter). Post-survey data suggests there was a decline from the time of the pre-survey data collection in the levels of confidence that sample members had concerning their ability to use Twitter.
Out of the 13 sample members that answered the question on the post-survey, only three members (23%) were high-level users. Most of the remaining sample population (8 members or 77%) ranked as having no ability to use Twitter. The remaining three members were considered beginning users at the time that the post-survey data was collected. Figure 13 illustrates the decline in the confidence of users' abilities to manipulate Twitter at the time of the pre-survey and again at the time of the post-survey.

Figure 13. A comparison from pre-survey to post-survey of sample members' abilities to use Twitter.

All of the aforementioned programs or skills can be applied to a variety of technologies. For example, the Apple iWork package can be used on a MAC desktop, a MAC laptop, an iPad tablet, or even an iPhone. This is just one example of how mobile technologies can be integrated across platforms. With this in mind, sample members were asked how well they use smartphones for more than talking by ranking themselves
on the same four-point Likert scale used previously (where one equals no knowledge or skill and a four equates to a high-level user).

Post-survey data (Question 12, g: Circle the appropriate number to rate your ability to... use a smartphone for more than talking) suggests that 50% of the sample population does more than just talk on the phone. This number is a 12.5% increase when compared to the same data taken from the pre-survey (Question 12, g: Circle the appropriate number to rate your ability to... use a smartphone for more than talking). Figure 14 illustrates the growth in members using smartphones for more than just talking from the time of the pre-survey to the post-survey data collection.

![Comparison of members' abilities to use smartphones for more than just talking](image)

**Figure 14.** Comparison of members' abilities to use smartphones for more than just talking.
As noted in Question 13 on the pre-survey (Before last Friday [October 7, 2011], had you ever head of Challenge Based Learning?), four members (25% of the total sample population) had not heard about Challenge Based Learning prior to the October 7, 2011, start date of the iPad pilot. When asked the same question again on the post-survey (Question 5: Before October 7, 2011, had you ever heard of Challenge Based Learning?), there was an increase in the number of members who were unfamiliar with Challenge Based Learning prior to that same October 7, 2011, date. Figure 15 compares the responses from the pre-survey and the post-survey to these identical questions.

![Figure 15. Number of sample member who have heard of Challenge Based Learning prior to October 7, 2011.](image)

Question 12 on the post-survey (Are you considering using CBL in future course assignments?) asks the sample members if they might considering voluntarily using
Challenge Based Learning in future course assignments. All 16 sample members (100% of the sample population) expressed a willingness to use Challenge Based Learning in other courses.

From the pre-survey, question 14 (What do you know about Challenge Based Learning?) asked each sample member to write down all that they knew about Challenge Based Learning. Seven out of the 16 sample members (43.75% of the total sample population) left the answer space blank. Furthermore, those sample members who did answer the question were vague with the responses. Such replies to the question included ideas about interactive and experiential learning, a resemblance to Project Based Learning, a focus on student engagement, and an initiative that provides opportunities for community interaction. Post-survey question 6 (After this J-Term experience, what do you know NOW about Challenge Based Learning?) asked the sample members to list what they knew about Challenge Based Learning after the J-term experience had ended. This time, sample members seemed more enthusiastic to participate and share ideas about Challenge Based Learning, with only one sample member not answering the question. Popular themes that emerged from the post-survey data included the following: motivational factors, that students enjoyed the Challenge Based Learning process, achievable solutions in a tangible form, student empowerment, innovation, teamwork, experiential learning. Only one sample member mentioned technology in respect to Challenge Based Learning.

From the pre-survey, question 15 (How will you use your iPad in your classes?) asked sample members to write down how the provided iPads would be used within the
classroom. Again, more than half of the sample members (56.25% of the total sample population, or 9 members) left this answer blank. Those sample members who did answer the question wrote about such themes as video editing and manipulation applications, PowerPoint, research, presenting and storytelling, editing Word documents, and iBooks. Question 7 on the post-survey (How did you use your iPad in your classes?) corresponds to question 15 on the pre-survey (How will you use your iPad in your classes?). In the post-survey, common themes in answers highlighted by the data included using the iPads for research and using the iPads for video creation, manipulation, and presentation.

Question 16 on the pre-survey (Which applications will you install on your iPad immediately and how will you use this application?) asked sample members to write down which applications would immediately be installed on the iPad provided. On the pre-survey, eight sample members (50% of the total sample population) left this question blank. Out of the members who did answer the question, popular themes included the Google Sky application, iMovie, MS Word, YouTube, PowerPoint, Pages, iTunes, iWork, and iBooks. Pre-survey question 16 (Which applications will you install on your iPad immediately and how will you use this application?) corresponds to post-survey question 8 (Which applications did you install on your iPad that were not already there and how did you use these applications?). Sixty-two point five percent of the sample population (10 members) either answered 'none' to the question or left the answer blank. Another popular answer included iMovie.
Summary of Findings

The research question examines to what extent the university faculty would want to use Challenge Based Learning in other courses. Responses to question number 12 on the post-survey (Are you considering using CBL [Challenge Based Learning] in future course assignments?) revealed that all of the sample members who answered the question were receptive to using Challenge Based Learning as a learning initiative in future classes. Out of the 16 sample members, 13 people wrote “yes,” as their answer to post-survey question number 12, one person wrote “sure,” one faculty member wrote “possibly,” and one sample member left the question unanswered. Otherwise stated, 93% of the sample population wanted to use Challenge Based Learning in other courses. The remaining seven percent (one sample member) who wrote “sure” in response to post-survey question 12 (Are you considering using CBL in future course assignments?) explained the answer by further writing that the choice of using Challenge Based Learning in other courses is directly contingent upon “the course and the goals.”
CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

The purpose of this study was to investigate and evaluate the extent to which University faculty members want to employ Challenge Based Learning in their courses. Challenge Based Learning is the learning initiative chosen by University administration to introduce the University’s faculty to 21st Century learning. To gain a better understanding of the mobile technology phenomenon within the scope of the academic environment, the perceptions of 16 faculty members were explored. These 16 faculty members participated in a two-and-a-half week Challenge Based Learning pilot that utilized iPads as the catalyst. The goal of the pilot study was to learn lessons that the teachers could apply in developing an understanding of a 21st Century learning community. In such a community, the belief is synergy exists between learning and mobile technologies.

The following research question guided this study: To what extent do the University faculty members want to employ Challenge Based Learning in their courses? In order to address this question, data was collected and analyzed. The answer to this question may inform future professional development when adopting, designing, and applying mobile technology based educational practices to learning initiatives, since Challenge Based Learning is foundational to effective teaching in a mobile learning environment (Apple Inc., 2010). The study focused on one higher-education institution and faculty attitudes regarding the new initiative were explored using survey research.
The data collected for this study came from a pre-survey and a post-survey. After collecting data from these two sources, responses were quantified and analyzed. Prior to the first meeting of the pilot group, sample members were provided a free iPad that was theirs to keep throughout and beyond the scope of the study. Training was delivered to the 16 sample members in five group sessions. The underlying goal of these group-training sessions was to teach the faculty to create lessons that engage students in critical thinking while levying iPads as tools to increase learning. This chapter provides an overview of the study’s conclusions, discusses the study’s limitations, and recommends potential extensions and directions for future research.

Limitations to study

As with any discussion on technology adoption, one must consider important limitations and challenges to the process. One limitation to this research is the sample size. Statistical analysis of data requires a minimum number (O'Leary, 2010). Additionally, the ability to work with probabilities [as in the results] is also contingent upon adequate sample sizes (O'Leary, 2010). The question of just how many subjects are required before testing a variable structural equation model has continued to plague researchers throughout time (Tanaka, 1987).

According to O’Leary (2010), to show significance in multivariate calculus, at least 10 cases, or samples, per variable are required. In this instance, the study’s sample size of 16 would be adequate. According to Sandelowski (1995), “determining adequate sample size…is ultimately a matter of judgment and experience in evaluating the quality of the information collected against the uses to which it will be put, the particular
research method and purposeful sampling strategy employed, and the research product intended.” A response to Sandelowski’s argument is that if determining sample size is contingent upon the researcher’s judgment, than a second layer of bias must be inherently introduced into the study. This second-layer bias is researcher bias. Researcher bias occurs when the researcher approaches the study with a priori assumptions (Onwuegbuzie & Leech, 2007). The possibility of the study being subject to researcher bias was intended to be defused by the introduction of several investigators. By incorporating investigator triangulation, the intent was to enhance confidence in the study’s findings. However, due to reasons of attrition, only a single researcher remained to examine, compare, and interpret the survey results.

The survey results also were subject to bias. “Program effect is the difference between the observed outcome and the outcome that would have occurred for those same targets, all other things being equal, had they not been exposed to the program” (Rossi, Lipsey, & Freeman, 2004, p. 267). This bias arises when the measurement of the outcome with program exposure is either higher or lower than that the corresponding “true” value, thus misrepresenting the actual program effect (Rossi, Lipsey, & Freeman, 2004).

It is important to note that program effect can also be masked by the occurrence of secular trends. These relatively long-term trends in the community, region, or country, may produce changes in the sample population that either enhance or mask the apparent effects of a program (Rossi, Lipsey, & Freeman, 2004). The existence of rapidly evolving network and computer equipment, coupled with the exponential growth of the
services and information available online, means that mobile technologies and their affects are widespread and profound. As a result, separating and isolating the variables is impossible.

Another area of discourse is the method of sample selection. To be considered for the study, each potential candidate must have been teaching during the University’s J-Term. The University’s Vice President for Academic Affairs designed J-Term classes with the intent of providing undergraduate students with a broad liberal arts educational background, while still providing a focused professional degree (Association of American Colleges and Universities, 2010). During this abbreviated two-and-a-half-week January term, students are provided with the opportunity to focus on something new and intensively, over a short amount of time (Association of American Colleges and Universities, 2010). These unique opportunities allow students to explore something different from the courses required by each college major, ultimately providing students with a glimpse into a traditional liberal arts education, while still completing the University’s standard professional degrees. Liberal arts, intended to provide general knowledge into the arts, humanities, and natural sciences (Bevins, 2011), aligns with the University’s extensively designed educational program (Association of American Colleges and Universities, 2010). The question is which faculty instruct this additional academic term, and why. Faculty teaching during the University’s J-Term are selected by an executive committee, and provided with the option of instructing during this term. No additional pay was provided.
Implications for Future Research

IPads and other tablet technologies are the ‘now’ (Geist, 2011). However, the technologies we know now will change. Although these mobile devices will play a part in the future, such products are more an example of a technological evolutionary trend than they are of a device that will withstand the test of time. I believe that future research would be valuable if concentrated on cloud computing as a sure and immediate replacement for the tangible mobile technologies of today.

Often the term “disruptive innovation” is associated with mobile technologies, as counter-arguments to mobile technology integration into academic environments are prevalent (Koszalka & Ntloedibe-Kuswani, 2010). One of the key barriers that inhibit successful technology integration efforts is available access (Lowther, Inan, Strahl, & Ross, 2008; Norris, Sullivan, Poirot, & Soloway, 2003; Shaw, 2003). In actuality, the idea behind disruptive innovation is as a company grows, the company seeks out the higher end of the market, in turn increasing the performance of the product while serving their existing market with innovation after innovation (Christensen, Horn, Caldera, & Soares, 2011). As these innovations progress, earlier technologies decrease in worth, forcing price points down, and subsequently making the technology more accessible. This Diffusion of Innovations explains how new technologies are integrated into a population (Rogers, 2003).

Another factor of successful technology integration into education is the belief of teachers (Chen, 2008; Ertmer, 2005; Lutnpe & Chambers, 2001). In a study conducted with 12 Taiwanese teachers, inconsistencies between the teachers’ expressed beliefs and
corresponding practices were established. “All participants reported high agreement on constructivist concepts promoted by educational policies, but the participants’ technology use was mainly for supporting content coverage” (Chen, 2008, p. 65). Additionally, external factors, such as teacher’s limited or incorrect educational beliefs, might affect interpretation of school policies, thus causing teacher’s incongruent practices (Chen, 2008). For these reasons, teachers’ opinions regarding technology in the classroom, and how these beliefs influence the integration process, should be addressed in future research.

Recomendations

Academic institutions across the globe are focusing on the value added to lessons that incorporate mobile technologies, such as the iPad. Challenge Based Learning, an initiative formed in 2008 from a joint venture between The New Media Consortium and Apple, Inc., provides the steps to make these mobile technologies an integral part of the learners’ school experiences. Challenge Based Learning first appeared five years ago and thus research and study replications are still scarce. One suggestion is that this study will serve as reference to other academics institutions intending to integrate mobile technologies into their culture. When other organizations replicate this study, two essential elements of professional development that should be explored are the acknowledgement of participants’ existing beliefs and practices and long-term follow-up. This study indicates that both elements are components needed for successful technology integration into educational initiatives.
The preexisting beliefs and practices of faculty participants were not considered during the study, but may affect the present attitudes of faculty toward mobile technologies. Teachers’ beliefs, sometimes referred to as teachers’ perceived self-efficacy (Abbitt & Klett, 2007), are described in the theoretical works of Bandura. Bandura posited, “Beliefs in one’s capabilities to organize and execute the courses of action required to produce self-attainments” (Bandura, 1997, p. 3). In respect to technology integration, teachers’ self-efficacy have been theorized to be a determining factor in how effectively a teacher is able to use technology to improve teaching and learning (Abbitt & Klett, 2007). In other words, “a teacher’s perception that he or she can effectively use technology in the process of teaching and learning will impact that teacher’s ability to do so” (Abbitt & Klett, 2007, p. 28). Although some research exists examining the attitudes of teachers of mobile technology (Abbitt & Klett, 2007; Hwang & Chang, 2011; Uzunboylu, Cavus, & Ercag, 2009), new research could focus on the preexisting beliefs and practices of teachers towards mobile technologies, and how that influences the use of mobile technologies in the practice of teaching.

Follow-up meetings to further participants’ understandings and skills after experiencing teaching Challenge Based Learning lessons as part of their classroom routine were not, but could be, provided. Subsequent training sessions ensure continued learning as participants apply new knowledge in the classroom (Duran, Brunvand, Ellsworth, & Sendag, 2012; Merriam & Leahy, 2005). Additionally, although the five training session provided core work skills and general knowledge, layering the foundation ensures employability (International Labour Organization, 2011).
Conclusion

Education is undergoing a massive paradigm shift, and I believe that academic institutions must make changes to accommodate the technological revolution if they are to maintain a competitive edge in today’s education market. This technological revolution changes the manner by which education is being approached by academic institutions around the globe, shifting students from passive receptacles of knowledge to active participants involved with both learning and the learning process. Subsequently, a new information economy has emerged in which the processes of knowledge transference have been abandoned for a more relevant and marketable commodity, critical thinking.

Meaningful technology integration into education focuses on mobile technologies as excellent tools with which to learn, rather than focusing on mobile technologies as tools with which you teach (Jonasses, Howland, Morre, & Marra, 2002). These devices provide flexibility and freedom to instructional settings, resulting in new pedagogies and approaches to delivering and facilitating instruction (Corbeil & Valdes-Corbeil, 2007). “If appropriately facilitated, mobile learning can benefit learners by providing instructional materials and interaction through mobile devices wherever and whenever they need it” (Corbeil & Valdes-Corbeil, 2007, p. 54). In a world marked by rapid changes from an industrial to an information-driven economy, technological developments allow information to be produced and disseminated to practically anyone, anywhere, at any time (Cope & Kalantzis, 2009).

This study supports the conclusion that the University faculty want to use Challenge Based Learning in other courses. Using Challenge Based Learning to bridge
common core content with today’s 21st Century mobile technologies enables learning to address present-day societal needs through a lens of innovative pragmatism. Innovation that fails to be pragmatic soon fails to be relevant. Likewise, pragmatism without innovative solutions lacks added value. This most important consequence of Challenge Based Learning shifts the academic experience from knowledge transference to innovative, active learning that addresses present-day societal challenges by generating knowledge that is new to society (Tuomi, 2007). The new society, characterized by the advent of mobile technologies into the higher educational arena, makes it is necessary to promote additional exploration into the needs of academic institutions integrating technology in into their curriculum, to generate concordant pedagogical models, and to share these advancements with the global marketplace.
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APPENDIX A: Pre-Survey Instrument

PLEASE PRINT YOUR FIRST AND LAST NAME:

Circle the one alternative that best completes the statement or answers the question.

1) Sex:
   Female
   Male

2) Ethnicity:
   African American
   Asian American
   Hispanic
   Native American
   Multi-ethnic
   White, non-Hispanic
   Other

3) How would you rate your overall ability to use technology?
   I can use technology without assistance whenever I need to.
   I need minimal assistance when using technology.
   I need a lot of assistance when using technology.
   I cannot use technology without assistance.

4) How many years have you been teaching at Lynn University?
   Less than 1 year
   1 to 2 years
   2 to 3 years
   3 to 5 years
   More than 5 years

5) How many classes are you teaching at the university during Fall 2011 term?
   1
   2
   3
   4 or more

6) Do you have a desktop computer at home?
   Yes Circle One: Windows Mac
   No

7) Do you have a laptop?
Yes Circle One: Windows Mac
No

8) If you have a laptop, do you carry it to classes with you?
   Yes
   No

9) Do you have an iPhone?
   Yes
   No

10) Prior to today, did you have an iPad?
    Yes
    No

11) On average, about how much time per week do you spend using a computer at school?
    Less than 15 minutes
    30-60 minutes
    1-2 hours
    2-5 hours
    5-10 hours
    More than 10 hours

12) Circle the appropriate number to rate your ability to perform each of the following:
    (1 = no knowledge/ability 4 = high level user):

   a. conduct research on the Internet
      1 2 3 4
   b. create and share images and video
      1 2 3 4
   c. use cloud computing tools
      1 2 3 4
   d. use Facebook, Flickr or Picasa
      1 2 3 4
   e. use Excel, PowerPoint, and Word 2010
      1 2 3 4
   f. use Twitter
      1 2 3 4
   g. use smart phone for more than talking
      1 2 3 4

13) Before last Friday (October 7, 2011), had you ever heard of Challenge Based Learning?
    Yes Circle One: Very Familiar or Somewhat familiar
           Only have heard of it but know nothing else
No

Please write your answer in the space provided.
14) What do you know about Challenge Based Learning?

_______________________________________________________________________
_______________________________________________________________________
_______________________________________________________________________

15) How will you use your iPad in your classes?

_______________________________________________________________________
_______________________________________________________________________
_______________________________________________________________________

16) Which application(s) will you install on your iPad immediately?
   a. ________________________________________________________________

      How will you use this application?
      __________________________________________________________________
      __________________________________________________________________
      __________________________________________________________________
      __________________________________________________________________

   b. ________________________________________________________________

      How will you use this application?
      __________________________________________________________________
      __________________________________________________________________
      __________________________________________________________________
      __________________________________________________________________

   c. ________________________________________________________________

      How will you use this application?
      __________________________________________________________________
      __________________________________________________________________
      __________________________________________________________________
      __________________________________________________________________

   d. ________________________________________________________________

      How will you use this application?
APPENDIX B: Post-Survey Instrument

PLEASE PRINT YOUR FIRST AND LAST NAME:

Circle the one alternative that best completes the statement or answers the question.

1. How would you rate your overall ability to use technology?
   - I can use technology without assistance whenever I need to.
   - I need minimal assistance when using technology.
   - I need a lot of assistance when using technology.
   - I cannot use technology without assistance.

2. Prior to September, did you have an iPad?
   - Yes
   - No

3. On average, about how much time per week do you spend using your iPad?
   - Less than 15 minutes
   - 30-60 minutes
   - 1-2 hours
   - 2-5 hours
   - 5-10 hours
   - More than 10 hours

4. Circle the appropriate number to rate your ability to perform each of the following:
   - 1 = no knowledge/ability
   - 4 = high level user

   a. Conduct research on the Internet
   1  2  3  4
b. Create, edit and share images and video
   1 2 3 4

c. use cloud computing tools
   1 2 3 4

d. use Facebook, Flickr or Picasa
   1 2 3 4

e. use Excel, PowerPoint, and Word 2010
   1 2 3 4

f. use Keynote, Numbers, or Pages
   1 2 3 4

g. use Twitter
   1 2 3 4

h. use smart phone for more than talking
   1 2 3 4

5) Before October 7, 2011, had you ever heard of Challenge Based Learning?
   Yes  Circle One:  Very Familiar
         Somewhat familiar
         Only had heard of it but know nothing else
   No

6) After this J-Term experience, what do you know NOW about Challenge Based Learning?
7) How did you use your iPad in your classes?

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

8) Which application(s) did you install on your iPad that wasn’t already there?

a. ______________________________________________________________________

How did you use this application?

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

b. ______________________________________________________________________

How did you use this application?

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________
How did you use this application?

9) Please describe a positive outcome in your experience using the iPad for class.

10) Please describe a negative outcome in your experience using the iPad for class.

11) Please describe your experience with CBL.
12) Are you considering using CBL in future course assignments?

13) Additional Comments
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