Developing a Smartphone MBA Program

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Abstract

The number of smartphones (mobile devices with advanced features) is growing at a rapid rate, estimated by one source as 33% per year (Sacco, 2007). The following paper is an analysis of the current state of the Online Higher Education (OHE) market in regards to creating a mobile MBA program for Quinnipiac University in Hamden, Connecticut. In addition to a market analysis, there is also an overview of mobile devices and smartphones, which pertains to the delivery of educational content on said devices. The paper then outlines the opportunities that can be capitalized upon, as well as the advantages, limitations and costs associated with creating a mobile MBA program at an institution of higher learning.

Keywords: Online Higher Education, smartphones, new MBA program delivery

1. INTRODUCTION

More and more people are carrying iPhones or BlackBerrys or other smartphones. And … more and more people are completing Master of Business Administration (MBA) degrees to remain competitive in today's business environment. What if a School of Business could offer an MBA degree entirely on smartphones?

This paper is a starting point for such a program. Is it possible? Feasible? What opportunities could be met by delivering an MBA program on smartphones? What difficulties and threats might exist to starting such a program? Can it be done? The authors' research suggests that the time is right to deliver courses and an MBA degree program by smartphone.

This paper therefore presents the convergence of online education, smartphones and a delivery mechanism to successfully deliver an MBA program by smartphone. In the paper the authors give a hypothetical case study of a commuter in the New York City area that can do the majority of his MBA course work through his smartphone. In the conclusion, the authors suggest that indeed, the time is right for Quinnipiac University to gain a competitive advantage as a first mover in this new arena.

2. DEFINITIONS

In order to more fully understand the purposes and goals of a smartphone MBA program, there must be a differentiation made between "online" education and "mobile" education.

Online education refers to the medium over which course content is delivered; meaning that course curricula are designed to be accessed by desktop or laptop PCs with a connection to the Internet. Essentially, students have limited access to their courses because they must have access to a wired or wireless signal in order to view coursework, or be "online."

Mobile education refers instead to both the hardware used to access courses and the ability to move freely and still be able to be connected. Using mobile devices eliminates the need to have a wired or wireless connection, thus giving students the freedom to study anywhere at any time.

3. MARKET ANALYSIS

The Online Higher Education (OHE) market has been growing steadily over the past three years. In fact, the growth rates have been increasing faster than the total student population in the higher education market, with nearly four million students enrolled in online courses and a growth rate of almost 13 percent per year (Allen & Seaman, 2008). In addition, people involved in OHE are "increasingly seeing value in online delivery." These people include school managers, teachers, students and even governments (Eduventures, 2007).

The programs with the highest enrollment are bachelor's degrees and master's degrees with 46.5% and 28% of online enrollment, respectively. The master's and doctoral student segment shows high potential for success because the students are "more academically experienced … [and] older consumers place higher value on convenience (Eduventures, 2008)." As of 2005, 61% of higher education institutions that were surveyed offered online master's programs, and the Master of Business Administration (MBA) degree was the most frequently offered master's program as of 2006 (Eduventures, 2007).

The majority of online educational providers operate in the local/mass market segment, meaning they tailor their programs to a large amount of people in a small target area. In contrast, very few universities operate in the local/niche market, meaning they offer a very specialized program to a small geographic area. "This reflects the fact that few online providers are entirely niche in programming terms, often mixing niche and mass market offerings to both capitalize on internal strengths and underserved populations and to reduce risk (Eduventures, 2007)."

The size of this market in dollars, according to a 2008 market update by Eduventures, "is around $11.5 billion this year and is expected to grow to $26 billion by 2013. As of 2008, online students made up about 11% of all higher education students in the United States (Glader, 2009)." Regardless of the high revenues of this market, the OHE market is still relatively immature, both in age and technology.

Wi-Fi, or wireless, Internet and 3G wireless networks has led to the birth of the mobile social networking industry and the mobile device revolution. Smartphones like Apple's iPhone, the Blackberry and Google's G1 and Palm's Pre have allowed for elegant user interfaces that are conducive to moving online education to the mobile platform. According to an article in the Journal of Computer Assisted Learning, "…those who are comfortable with their mobile devices use it constantly and often prefer it as a tool to learning rather than some of the other tools available." The article goes on to say, "It will be interesting to see over the next decade if [cell phones] will replace the laptop and desktop computer just as they have nearly replaced the land line telephone. If educators want to stay ahead of the technology fads, then mobile devices might be something to watch ("Informal Learning," 2008)."

4.MOBILE DEVICES & SMARTPHONES

According to Sacco (2007) of CIO.com, "The number of smartphones in use throughout the world will increase by an average of 33 percent each year through 2012." A more recent report is still optimistic for the smartphone market even in unsure economic times, saying it "expects global unit growth for smartphones to reach 192.3 million units in 2009, up 11.1% over 2008's 173.6 million total ("Expect Growth," 2009)."

"A smartphone is a mobile phone offering advanced capabilities, often with PC-like functionality...[and] advanced features like e-mail, Internet and e-book reader capabilities, and/or a built-in full keyboard or external USB keyboard and VGA connector ("Smartphone," 2009)."

Smartphones are generally run on one of seven operating systems that allow them to work like a miniature PC. These operating systems, with relative market share percentages, are:
Symbian OS (47.1%)
RIM BlackBerry (19.5%)
Windows Mobile (12.4%)
iPhone OS (10.7%)
Linux (8.4%)
Palm webOS (0.9%)
Android (n/a) ("Smartphone," 2009).

These operating systems allow smartphone users to be constantly connected to the Internet, their email and other social applications, which create an interconnectedness that has not been seen in society up to this point.

While there are a number of popular operating systems for handheld devices, this program will begin by focusing on the iPhone OS and will later be used on the RIM BlackBerry OS. The main reason for this is because of the visual interfaces that are offered by the two operating systems. Also, the popularity of the Apple App Store and BlackBerry's app store are major influencers that draw the authors to develop for these devices.

This constant connection has led to a revolution in smartphone applications, both for entertainment and education. The Apple App Store for iPhone has over 3,900 applications in the "Education" category, accounting for nearly 8% of the total applications in the store. These applications range from simple flash cards and memory games to encyclopedias, classroom polling applications and e-book readers. Also included in the App Store are 1,900 "Business" applications, and 1,300 "Finance" applications, which will all be available to mobile students to help with their educational needs (Apple Inc., 2009). These types of applications have "extended [the] desktop-based online learning environment into the mobile and wireless channel [and] also enabled education to take place anytime, anywhere." In addition, "Mobile technology provides greater flexibility in student learning … [and] enables them to learn as and when the need arises and when the time is right for them, no matter where

they are – even when they are on the move (Siau & Nah, 2006)."

5. OPPORTUNITY

The authors suggest that Quinnipiac University, located in the Greater New York/Boston area, develop an MBA program that is delivered through the online higher education market using only smartphones. The online higher education market is growing rapidly, but the mobile education market is untapped. In the OHE market, the majority of schools are offering between three and five online programs to either a local or national audience.

There is a distinct lack of specialized, niche programs like a mobile MBA program. This would differentiate Quinnipiac University from other online education providers because it would have a common position (meaning its geographic reach is equivalent to other universities) but with a distinct programming differentiation. At the same time, it would put the Quinnipiac University MBA program in an uncommon differentiated position (meaning there is a distinct difference between the way content is delivered) because there is a different value proposition to the students than most other schools are able to offer.

Being one of the first movers in such a leading edge field would potentially increase the brand power of Quinnipiac University while also providing another revenue stream. Allowing students to learn in a manner that they are comfortable and familiar with will generate interest in the university and attract a higher caliber of student that is willing to be on the leading edge of the higher education system.

Being on the leading edge of this mobile revolution also offers the opportunity to be one of the leaders in mobile education software. Quinnipiac University's affiliation with Carrot Creative, a digital media agency in Brooklyn, New York, gives the university the potential to develop its own "mobile university software package" that could then be licensed to other universities across the country. Once again, this proprietary software would generate yet another revenue stream for the university.

6. HYPOTHETICAL CASE STUDY

John Doe commutes daily from Stamford, CT to Manhattan. He is on the Metro North train for about 45 minutes each way. John has a company-provided iPhone and has enrolled in the Quinnipiac University Mobile MBA program. This semester, he is taking FIN600 – Financial Analysis and Decision Making. As part of that class, he needs to analyze bond and stock valuations, and has many iPhone applications that provide him with real-time stock and bond prices.

Today as he gets on the train he starts an analysis of the bond market, opening his Quinnipiac University Mobile application and downloading information from today's edition of the Wall Street Journal. Finding the numbers that he is looking for, John realizes that he cannot remember the formula for calculating the P/E ratio of his assigned company. He flicks the "back" button and slides the page down to the article titled "important ratio calculations," gives one click to view it and quickly finds the answer to his question.

With his stock and bond valuations complete, John moves on to his next assignment – viewing his professor's lecture on Risk and Return. John plugs his headphones into his iPhone and flicks the "video" button at the top of the application, immediately bringing the professor's lecture to the screen. When he has a question about the lecture material, John pauses the video to record his own video, which can be instantly uploaded to his professor and responded to in a timely manner.

John is now in his second mobile course. Last semester, John was enrolled in EC600 – Managerial Economics and IB600 – Managing in a Global Economy. Both classes were similarly structured, but both made more use of audio files and PowerPoint slides, both of which were accessible from within the Quinnipiac Mobile application home screen. He also used the application's social features more often, sending an SMS message to his classmate Jane to ask for clarification about a project and meeting up with his classmate Jeff for lunch after seeing his status update that he was in the local café.

John sees many advantages of using his iPhone to attain his MBA degree. His favorite aspect of this program is the ability to access all the information he needs from the palm of his hand. RSS feeds, Microsoft Office Suite documents, video and audio content and a constant connection to the Internet make his studies convenient for him and allow him to access these things anywhere and at any time. John also enjoys that this mobile device is less bulky and easier to transport than his laptop PC and that the Quinnipiac Mobile application is very user friendly – including the Internet, phone and camera into one device.

While there are many advantages to the mobile MBA program, John does see some disadvantages. The main problem he sees is the difficulty of typing large blocks of text. He is able to answer short-answer discussion questions, but has difficulty with more lengthy assignments. He is able to complete these assignments on his laptop computer when necessary, but needs to do that less often than he imagined. He also wishes he could have some face-to-face time with his professor and classmate, but finds that his video questions and responses are able to give him the feeling of individual instruction.

Overall, John is very satisfied with his Quinnipiac Mobile MBA program. His ability to get his MBA in a manner that is convenient to him is invaluable. He also felt that he was able to make good use of his spare time, making his commutes into class time. He also managed to further his career, constantly impressing his boss with bits of knowledge he had learned that day on the way to work.

He knows many others that have completed online MBA programs by using their commuting time for their classes. He feels he is getting a much more robust experience from taking the mobile MBA from Quinnipiac University and has been showing off some of the course materials to his fellow commuters and to office mates.

7. ADVANTAGES

There are several advantages to offering an MBA program using a mobile platform. The most obvious, and possibly most important,

aspect of a mobile MBA is the added convenience of being able to access course content anywhere and at any time. This will allow students to learn at their own pace. For example, if a student in the populated New York City area rides a commuter train to work in Manhattan, he or she can do his or her assignments during the daily commute. Rossman (2008) comments that "Handheld mobile computing devices allow for exploratory activities not bound to a special location, for example field trips, without losing the potential for taking electronic notes and retrieving information of various types."

This detachment of learning from a physical location enables students to be constant learners as well as situational learners. Rossman goes on to say "This can redefine 'on the job' training for someone who accesses a lesson literally 'just in time' while faced with a new challenge and they have to turn to their mobile device for instant answers." Once again, the convenience of being able to access a mobile classroom at any time is priceless to a student on the go.

In addition to convenience, students will also be able to use technologies that they are comfortable with. The strong growth of the smartphone market will ensure that students will be familiar with the mobile platform and its capabilities and limitations, thus ensuring that mobile delivery of educational material will be equally as effective as a traditional in-class or online course. The ubiquity of the cell phone also ensures that there will be a niche market that will be willing to use their mobile device as a learning tool instead of simply a communication device.

The technology has advanced to the point that students will not just interact passively with the mobile learning application because the administrators will be able to "push" notifications to the students, both alerting them to new assignments and material and seeking a response to this new material. This is congruent with ideas presented in Muyinda's 2008 article that "learning should invoke a stimulus and response."

While convenience and technological comfort are both extremely important aspects of mobile learning, they mean nothing without students who are properly prepared to be self-motivated and active in the learning process. A mobile MBA program will attract students who are just that: both self-motivated and willing participants in a new and cutting-edge segment of education. In traditional classrooms students are passive learners, meaning they act as sponges soaking up the information that the professor is either lecturing about or writing on the whiteboard.

This can lead to both boredom and complacency for both the professor and students. The advantage of mobile learning is that students must engage themselves in the learning process, actively searching for answers and clarification. The mobile device allows them to do this because they have constant access to information wherever they are and whenever they need it.

A mobile MBA program will not only enhance the learning opportunities at Quinnipiac University, but it will also increase the name recognition of the university and increase the brand awareness, both regionally and nationally. Quinnipiac University will become well known for its ability to innovate and be a progressive leader in mobile education, making Quinnipiac University a destination school for talented new, tech savvy students and faculty.

One other advantage of a mobile MBA program is the ability to create a proprietary "mobile education software bundle" that could become the nationwide standard for mobile education. This is an incredible opportunity for Quinnipiac University to create intellectual property that has the potential to generate additional revenue streams and to become a leader in mobile education software.

8. LIMITATIONS

While there are many advantages to mobile delivery of an MBA program, there are also a few limitations. The first limitation is adoption of new practices by faculty and staff. Not everyone is fluent with mobile devices and mobile communication, therefore not all professors may be willing to prepare for mobile delivery of their courses. To overcome this hurdle, there would need to be training sessions that would familiarize

the faculty and staff with mobile devices and designing classes for effective mobile learning.

One other limitation is the ability to write large blocks of text on a mobile device. Many critics believe the mobile devices themselves are not made for longhand writing, which means term papers and other long-response assignments would have to be completed either on a personal computer or laptop. While this is a valid argument, it is argued by Chepya (2007) that such intricacies of mobile devices should not be taken into account when designing for mobile education because "anyone can become accustomed to it, like riding a bicycle. The size of the keyboard enlarges with each use, and the micro-screen is wall-sized in the mind's eye." The physiology of student's bodies enables them to overcome these technical limitations. In addition, advances in speech recognition – such as the "Speech to Text" application – will allow students to skip over typing all together and to dictate assignments rather than use the small keyboards.

The final limitation of a mobile MBA program is that it is such a new concept that there is only a very small niche market that would be willing to be the early adopters. There would need to be a strong regional marketing campaign (with an emphasis in the populated New York City area) in order to generate interest in the new program, but based on an Eduventures market update (2008), "A maturing [online higher education] market, in every sense, is forecast to drive a more nuanced and diversified approach to positioning and differentiation. This scenario may be more supportive of growing the online market into additional disciplines and demographics." This study shows that the market is ready for change and Quinnipiac University can be one of the pioneers in this mobile space.

9. OTHER MOVERS IN THE MARKET

While many universities have not yet recognized the immense potential of mobile learning, some schools have begun to implement their own versions of mobile curricula. Walden University in Minneapolis has recently launched a program called "MobileLearn" that "allows students to access course materials in a way that best fits their own learning style ("MobileLearn," 2009)." In addition to being able to access course materials from their laptops, the school has made lectures and videos available for download onto smartphones and MP3 players ensuring that their students can be truly flexible in their studies ("MobileLearn," 2009).

Several other schools have also started to integrate iTunes University into their curricula. High-power schools such as MIT, Stanford, Yale and Arizona State have all begun uploading lectures and classes onto the popular music and video store in order to maximize visibility to the public, as well as enhance their students' ability to access their learning materials in a way that is convenient for them.

Blackboard, a leading education technology company, recently bought TerriblyClever Design, a firm that builds iPhone applications for universities across the country. This is clear indication that Blackboard is aggressively broadening their product line and moving into the mobile education market.

In addition to universities and educational technology companies, the state of North Carolina is strongly considering instituting mobile learning to raise standardized test scores. By allowing high school students to access educational materials on their cell phones, the NC Department of Public Instruction hopes "that by using current technology in a new way, [they] can re-engage students and help them reach important academic goals (US Fed, 2007)." But, these inroads into mobile applications are only piece-meal applications, not the delivery of a complete program.

10. TYPES OF USEFUL MEDIA

Due to the limitations listed above, there are certain media that are more conducive to learning on a mobile device. The first of these media types is video.

The iPhone and iPod touch are both designed to display video on their screens at a resolution of 480 pixels by 320 pixels, which is excellent given the small size of the screen. This gives the designer of a mobile

course the option to create meaningful and effective instructional videos that can be broadcast to the students. It is recommended that these videos do not exceed 10 minutes in length in order to keep the content engaging while also allowing the students to be spontaneous with their viewing habits.

The second type of media that would work well on the mobile platform is audio content. iPods and iPhones are specifically designed to use audio content, which means functionality will be maintained. Audio is also a convenient and effective tool for learning. This would allow students to listen to class lectures as they are exercising, driving or just sitting on the train on the way to work. Again, the convenience of audio content on a mobile device will allow students to listen at their own pace and facilitate spontaneity in their studies.

The final type of content is print media. This category includes text documents (less desirable) as well as PowerPoint slideshows (more desirable). While print media is not as desirable as video and audio content, it is often necessary to reinforce main points and receive responses to questions from students.

11. TYPES OF ASSIGMENTS

A weekly learning module for a mobile MBA class will include at least two main aspects: instructional video viewing, and discussion. When the professor uploads new content or assignments, the application will notify the students in their news feed.
Instructional videos should be no longer than ten minutes, but should include important information that the professor wants to get across to the students. Ideally, these videos will be about course content and instruct the students on how to apply new skills that they are learning in class. The videos can also be a discussion of current events and how they relate to class. Videos are an interesting and effective way to convey important information, and students should be able to comment on these videos if they have specific questions.

Discussion can be either student-to-student or student-to-professor, but it will include students creating their own content to

convey to others that they understand the information that they need to learn. This content can be video, audio or text, and should be commented on by the other students and the professor so students get feedback about the work they are doing.

12. SOCIAL FUNCTIONALITY

An interesting aspect of mobile devices is that they add social networking functionality to learning.

Firstly, mobile devices all include telephonic capabilities, which allows students to access each other and the professor in a nearly immediate way. Secondly, many smartphones are location aware, giving students the ability to find each other and meet to talk about specific issues they may be having in their courses.

The ability of smartphones to be constantly connected to the Internet also gives one the opportunity to add social features from popular social networking sites into their mobile application.

The application should include a user profile that includes your name, picture and contact information, as well as interests. This will allow other students to find like-minded people and get in touch with them.

In addition to the profile, there will be a "social" tab that will basically act as a mashup of LinkedIn, Facebook and Blackboard. This tab will be a news feed of posted assignments, discussion between students in a given class and the contact information noted above. This will encourage increased interaction between students and the professor. Specifically, when the professor posts a note, video, assignment, etc., there will be an update on the application that says, "Dr. _____ has uploaded a new _____!" Students will also be able to update their status with things like, "Having trouble with the _____ assignment. Can anyone help?" or, "I am at _____, who can meet to talk about the assignment?"

13. USER EXPERIENCE

The user interface (UI) must be designed with inexperienced mobile users in mind,

which means it must be simple and intuitive. An overabundance of buttons and functions will only confuse and frustrate students, creating a negative overall experience. In order to create a positive user experience, there should be an obvious button for each function of the application: profile, content, and communication. These buttons can either be at the top or bottom of the application, but should be visible on all pages. There can also be a button that can switch between classes in which the student is enrolled, which can be as simple as a scrolling menu at the top or bottom of the page.

The profile and communications pages should resemble a Facebook profile and news feed in order to keep the experience similar to other applications that students may have used before. Once again, the familiarity of the experience will create a positive experience for the students using the mobile platform.

14. SUGGESTIONS TO BEGIN UTILIZING A MOBILE LEARNING PROGRAM

In order to integrate a mobile learning program into an institution of higher learning, there must some changes on the administrative level that will facilitate this new form of learning.

These changes include repurposing and generating new content, understanding and altering administrative roles and training and supporting staff members who will be involved in the program.

First, there must be an audit of the content that is already available for traditional and online learning in order to see how much of it can be repurposed to be used on mobile devices. For example, Quinnipiac University has a monthly speaker come to the business school to talk about their experiences in the current business environment. One speaker may talk about many different aspects of business – from government regulation to foreign direct investment. The video reproduction of this lecture is usable for many different courses, but must be repurposed for each course that will be using it.

The role of administrators is a critically important factor to consider when integrating a mobile learning program into a university's curriculum. Professors, as well as deans, must be aware that teaching with mobile devices will be different than teaching in a classroom environment, and that they will need to be prepared for – and be able to adapt to – this new environment. In essence, mobile learning professors "need to understand the need to outline roles and responsibilities for mobile learning activities – management, technical, research, dissemination, evaluation and training (Muyinda, 2007)." It is imperative that universities develop a staff of administrators and professors who are willing to embrace these changes. Done with enthusiasm and creativity, constructing a mobile learning curriculum will transform the teaching/learning paradigm.

15. COSTS

The development costs of developing a mobile MBA program are straightforward. There will be the usual costs associated with faculty and staff as well as the overhead costs of providing space for the faculty. The primary cost that would be associated with starting the program will be the design and programming of the mobile education software that will be needed to deliver effective content to the students.

The second cost will be the training of the faculty and staff on how to effectively design a mobile education course. This includes training from both the makers of the educational software as well as the technical staff for things such as recording and uploading video and audio to the Web. There is also the potential for cross-discipline cooperation between the School of Business and the School of Arts and Sciences, which could reduce the costs of training.

One possible cost might be providing mobile devices to students who do not have phones with the necessary capabilities needed for online education. The authors think that may not be an issue because of the rapid growth in smartphones. But, if students do not have the technology, they would mean that the students would have to purchase or lease a smartphone (i.e. an iPhone,

Blackberry, etc.) from Quinnipiac University, and then that student would be responsible for paying the service provider's monthly fee. This purchase could either be done by loaning the devices to students, or by outright purchase depending on that student's needs. This cost is relatively low, but still must be incurred in order for the mobile MBA program to become successful.

16. RECOMMENDATION

The authors recommend that Quinnipiac University pursue the following opportunities:

- Begin offering a Mobile MBA program for students who are willing to do so. This MBA program will include:

- Delivery of content (lectures, notes, videos) via mobile devices such as the iPhone, Blackberry and Pre smartphones.

- Development of a proprietary mobile education software suite in cooperation with Carrot Creative which will include the ability to:

- Create "class groups" that give access to only the students enrolled in the course,

- Upload video, audio, images and text, and

- Access this content anywhere, at any time, by any capable mobile device.

17. CONCLUSION

We have researched a growing communications medium – the Smartphone – and have extrapolated that concept to the delivery of mobile graduate programs.

We have done an analysis with the opportunity of first mover in this market and an analysis of what costs and disadvantages might be associated with developing a smartphone MBA program.
The authors reason that the market is 'ripe' for such a mobile online program delivery with the features and advantages offered by smartphones. Furthermore, the authors feel such a 'first mover' program would be of benefit to Quinnipiac University and ABC media services.

18. REFERENCES

Allen, I, & J. Seaman, "Staying the Course: Online Education in the United States, 2008", published by the Sloan Consortium, November 2008, retrieved from: http://www.sloan-c.org/publications/survey/index.asp July 29, 2009

Apple, Inc. (2009). Apple – Downloads. Retrieved July 27, 2009, from http://www.apple.com/downloads/.

Chepya, Peter. (2007). A short take on design challenges in the mobile education world. The Community College Enterprise; Fall 2007; 13,2; ProQuest Educational Journals. Pg. 61.

Eduventures, LLC. (2006). Online Higher Education Market Update 2006, Part 1: Students, Growth & Geography. Boston, MA.

Eduventures, LLC. (2007). Online Higher Education Market Update 2006, Part 2: Credentials & Programs. Boston, MA.

Eduventures, LLC. Online Higher Education Market Update 2008: Market Size, Forecasts and Differentiation [PowerPoint Slides]. Retrieved via Quinnipiac University.

Glader, P. (2009, June 22). The Jack Welch MBA Coming to Web --- Business Icon Lends His Name to New Online University Program; 'It's a Real Education,' He Says. Wall Street Journal (Eastern Edition), p. B.1.

MD&D News Staff. (March 4, 2009). Expect Growth In The Smart-Phone Market Despite The Poor Economy. Retrieved July 27, 2009 from, http://mobiledevdesign.com/software_news/smart-phone-growth-despite -poor-econ-0304/

MobileLearn(TM) Helps Walden University Students Tailor Learning Experience. (6 July). PR

Muyinda, Paul B. (2007). MLearning: pedagogical, technical and

organisational hypes and realities. Campus-Wide Information Systems, 24(2), 97-104. Retrieved September 24, 2009, from ABI/INFORM Global. (Document ID: 1236474891).

Newswire. Retrieved July 22, 2009, from ABI/INFORM Dateline. (Document ID: 1777487371).

"North Carolina Department of Public Instruction and QUALCOMM Announce Mobile Education Pilot Project." US Fed News Service, Including US State News. Washington, D.C.: Mar 27, 2007.

Rossman, P.. (2008). M-Learning – As a paradigm of new forms in education. E+M Ekonomie a Management, (1), 119-125. Retreived September 24, 2009, from ABI/INFORM Global. (Document ID: 1569056991).

Sacco. A. (Nov 14, 2007). In-Stat: Worldwide Smartphone Market to Grow More Than 30 Percent Each Year Through 2012. Retrieved July 23, 2009 from, http://www.cio.com/article/ 155001/In_Stat_Worldwide_Smartphon e_Market_to_Grow_More_Than_Percent _Each_Year_Through_

Siau, K, & Nah, F. (2006). Mobile Technology in Education. IEEE Transactions on Education, May 2006, volume 49, p. 181

Wikipedia Smartphone. (July 28, 2009). Retrieved July 23, 2009, from Wikipedia: http://en.wikipedia.org/ wiki/Smartphone.