Smart Phones and Smart Users: Developing Online Courses for Use on the Smartphone.

By Eddie Gose
University of Hawaii

Abstract

With the popularity of smartphones on the rise, students are using their mobile devices to access everything from email to their social networks. The purpose of this research was to explore what student perceptions were on using their smartphones for their online courses and to explore what were distance course designer perceptions on developing courses for the smartphone device environment. Students were concerned about the costs involved, the limitation of the input device, the small screen size, lack of operational programs, the location of learning, and whether the device was the best tool to use. The students also felt that smartphones were constantly being approved upon and they had no doubt that future device improvements will overcome the current issues. The designers reported that there was compatibility issues between the various operating systems, that developing easy navigation was important, and that course content needed to be lightweight and portable. The evolution of the smartphone has undeniably affected the way we communicate, socialize, work, and access information. Through the perspectives of online learners and online course developers, this research explored the issues of it being a mobile learning device for online course access.

Introduction

The advancement of computer technologies and the World Wide Web have allowed many users to successfully fulfill degrees via the online learning environment. University systems have recognized that expanding their programs requires their ability to offer an online component (Allen & Seaman, 2006).

A successful online program starts with basic essentials such as a functional and reliable campus network, secure access, data storage, and availability of the technology tools to access the online environment. Other factors that affect success are faculty training (for administrative and technology support), technology mentoring, and effective course development. Besides being the facilitator of an online course, the instructor must also provide students with the administrative and technology support (Maiuka, Shi, & Bonk, 2005; Restauri, 2004). Removing institutional barriers, updating obsolete policies, accepting the technology paradigm shift, developing faculty and staff skills, considering faculty workload, designing effective instruction, and selecting appropriate technology equates to a good online program (McLean, 2005; Thompson, 2003). The use of mobile technologies are becoming acceptable means from which students connect to their online courses. Using mobile technologies to learn lends itself to the term mobile learning or m-learning (Wagner, 2005). These mobile technologies include laptops, handheld computers, netbooks, and more recently devices such as tablet computers and smartphones.

Wagner (2005) defines a smartphone as any handheld device that integrates personal information management with mobile phone capabilities, and the key feature of its addition of mobile applications. Mobile phones and emerging technologies are enabling phones to do more than transmit voice calls. Besides the basic ability to transmit voice communication, mobile phones are evolving in tandem with other technologies such as GPS, digital photography, digital video recordings, electronic book readers, and internet browsers. Whether for business or personal use, smartphones’ communication prowess includes the ability to surf the internet, instant message, email, and access social media tools.

The International Telecommunication Union (2010) predicts that by the end of 2010, there will be five billion mobile phone subscribers worldwide. Pew Internet reports that 82% of all U.S. adults are cell phone users, with a little less than a quarter of them owning a landline (Purcell, Entner, & Henderson, 2010). Amongst all U.S. cell phone users, the Nielsun Report (2010) has discovered that 25% of all U.S. mobile subscribers own a smartphone. More than half of U.S. teens are texting daily, and over 40 million U.S. adults are accessing the internet using their cell phones.
Advances in smartphone technologies have made it increasingly easy for users to stay connected. Within the last decade, these smartphones have become smaller, less expensive, and more powerful in computing. These smartphones have revolutionized the way individuals are connected to the world (Schlosser, 2002). Individuals are using the available features like the calendar, GPS, the web browser, the camera, the organizer, games, and thousands of other applications; it would seem logical that students with smartphones would use it to access their online courses.

With the rich success of higher education implementing online programs, emerging research are now focusing on the advancement of technologies for use in education. The advent of Wi-Fi, Bluetooth, and global wireless technologies such as GPS, GSM, 3G, and 4G have created new possibilities for students to stay connected online. When the new communication technologies merged with mobile computers, mobile learning emerged. In terms of technology and learning, mobile learning has also been defined as learning that takes place via wireless devices such as laptop computers, personal digital assistants, netbooks, e-readers and mobile phones (O’Malley, Vavoula, Glew, Taylor, Sharples, & Lefrere, 2003; Wagner, 2005). With the expansion of data networks and the advancement of smartphone devices, Asians and Europeans are finding that their computing and broadband computing needs can be met through a single device (Wagner, 2005). Given the vast research concerning m-learning devices, this research will specifically focus on the smartphone.

Methodology

Purpose of the research

The use of smartphones to support, enhance, and improve online course access is a relatively new idea; many students are using their smartphones for their everyday communication needs. The purpose of this exploratory study was aimed to explore if students are using their smartphones for their online learning and what their perceptions were about using them and what online course designers felt about developing for them.

Exploratory study

This exploratory study on using smartphones for accessing online courses, did not utilize quantitative research techniques because it was not the best method for reporting perceptions. Literature recommends the use of a qualitative approach when confronted with new and emerging research (Maykut & Moorhouse, 1994; Hoepfl, 1997). This study utilized focus group interviews and follow up one-on-one interviews.

A typical description of this qualitative study suggested that it is based on grounded theory. Qualitative researchers using grounded theory are expected to gather rich descriptive data and ground conclusions and understandings from the data collected, not prior theories (Charmaz, 2003; Creswell, 2005; Strauss, 1987). It is the particulars that will alert the researcher the attitudes of the participants towards the research topics. This qualitative inquiry involves using a flexible structure (Creswell, 2005). Basch (1987) has suggested that focus groups with adults are a relatively easy and flexible way to gather a diverse range of information and learn about the ideas and opinions of homogeneous groups.

Instrumentation

Several instruments were used to investigate the research topics. In allowing for emergence, the most effective strategy employed in this qualitative study was the use of triangulation to ensure reliability: focus group interviews and follow up interviews.

The researcher first compiled and determined significant themes from each group about their perceptions of smartphones use or development for mobile learning. After the preliminary themes were developed, the researcher interviewed new participants for one-on-one interviews.

The focus group phase of data collection functioned as the primary source of findings. The second phase of one-on-one interviews refined the data points collected in the first phase. This two-step data collection process supports the principles of constructivist grounded theory (Charmaz, 2003). This constructivist approach acknowledges that the researcher interacted with the participants, the data, and the analysis. The data collected was used to formulate common themes and ideas which were then reported in the findings section.
Participants

The first topic of the study was to understand qualitatively student perceptions of using smartphones to access online courses. The second topic was to explore course developers’ perceptions and ideas behind developing online courses for the smartphone environment. The first phase of the study collected data from two separate focus groups. Each small group had at least three participants each and all participants had a smartphone device as their main cellular device. The focus groups were separated into students and course developers.

The student group comprised of five volunteers who fit three criteria: having a smartphone, having participated in an online course, and be willing to participate in this exploratory study. Three males and two females were selected. All of the students were at least 20 years of age and attend a public university. Participants were classified undergraduate and graduate students in differing departments which included computer science, language studies, and education. The researcher purposely selected participants because of the polar criteria needed to explore the topic.

The second focus group was comprised of four course developers from a grant sponsored online course development team. Three were instructional designers and the other was a graphic designer. The participants also came from various educational backgrounds from graphic design, communication, business administration and educational technology.

The one-on-one participants consisted of two smartphone using students and two online course developers, and their ages ranged between 25 to 35. Their educational backgrounds also varied. The students reported that they each have had more than two years of online course experience. While the developers had more than five years of experience in developing online courses. The interviews were used to clarify some of the emerging themes and ideas collected from the first phase.

Research topics

The researcher began the focus groups with a grand tour question. Grand tour questions are broad and unfocused questions which allow the interviewees to lead the researcher into specific topics (Shank, 2006). The qualitative inquiry of the focus groups and one-on-one interviews aimed to gather information and explore two main topics: students’ perceptions of using smartphones for their online courses and course designers’ perceptions when developing online courses for the smartphone environment. Figure 1 lists sample questions used in the focus group and interviews.

<table>
<thead>
<tr>
<th>Topic 1</th>
<th>What are students’ perceptions of using smartphones for their online courses.</th>
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<tr>
<td>Topic 1 Sample Questions</td>
<td>Are you accessing your online courses via your smartphone?</td>
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<td>Is using a smartphone to access your course a viable means to access your online course or course content?</td>
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<td>What do you perceive to be the important basic level needs (student needs, software needs, or hardware needs) required for accessing online courses on your smartphone?</td>
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<td>Topic 2</td>
<td>What are course designers’ perceptions about developing online courses or course content for the smartphone.</td>
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<td>Topic 2 Sample Questions</td>
<td>What should course developers know about developing courses for the smartphone environment?</td>
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<td>What are some of the advantages/challenges of developing courses for the smartphone environment?</td>
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<td></td>
<td>Should course designers be developing courses for use on a smartphone?</td>
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</tbody>
</table>

Figure 1. Semi-structured topic and sample questions
Findings

Topic 1 Findings

Using a smartphone costs students money.

Although the participants had smartphones, there are a couple of costs involved in using it. The first cost would be the purchase of the smartphone, and the second cost would be the monthly plan to use it. Some students perceived that if they were using their phone for educational use, they wanted to know if they could get cheaper educational rates for smartphone purchase or cheaper data rates. The students felt the smartphone costs were not equivalent to textbook costs, since smartphone data plans required 2-year contracts which was much longer than the duration of any course.

Smartphones need better input devices.

There were differing skill levels when it came to typing text on their smartphones. Some smartphones utilize touch text, others include a physical keyboard, and others use Swype. Swype is a text tracing application that allows for faster and easier typing input. A participant reported that having bigger fingers meant typing was a pain and if he had the choice, he would just wait to use a real keyboard on his laptop. It was clear that the participants were learning to become more effective smartphone typists, but they agreed that typing speeds were significantly slower compared to real keyboard typing. On the other hand, most students felt that they preferred using a touch screen over a ball mouse or touchpad.

Smartphones need bigger screen sizes.

Participants agreed that screen size was one of their biggest concerns about accessing their courses online. The students reported that their smartphones could easily log into their courses, but the courses were difficult to see and required extra scrolling and zooming just to navigate through the course. Screen size differed amongst the smartphones but the general perception was that the screens were too small to productively view the course.

Not everything works on the different phones.

Along with difficulty in navigating through a course, participants could not access certain content in their course. Differing smartphones have different capabilities. For example, some phones are able to watch Flash animations, while others cannot. Another example is document handling; some phones could easily download and view documents while others could not. A participant stated that most files were made to be used on the computing environment and the smartphone is not quite there yet.

Using a smartphone for accessing and completing their online course was not the best mobile learning device tool.

The participants perceived that a laptop with internet access was the mobile learning device of choice when it came to online course access and participation. They suggested that using a smartphone as a supplemental tool may be a better approach when it comes to mobile learning. They perceived that accessing components such as email, electronic readings, at a glance course calendar or schedule, and list of homework assignments would work better with the smartphone environment. This method suited most students’ needs because it would not be wasting battery life. They felt that mobile learning would be optimally reached if they used their Wi-Fi enabled laptops at their convenience.

Students felt that not everywhere was a good place for learning.

When suggested that commuting would be a good time to learn, many responded that they used that time to play games, update their social networks, listen to music, and read up on the news. Many felt that it was just easier to complete their online learning in places more suitable for learning (e.g. home, library, café, or quiet corner). They perceived that their smartphones keeps them connected, but there were limits to how much they need to be connected. Participants felt that they were willing to wait and access their courses when they were ready to focus on it.

There are problems but it’s getting better.
Most agreed that smartphones could make their lives easier by supporting, enhancing, and improving their access to their social, work, and educational lives. They felt that the hardware and software were improving with every new version of their smartphone. The students agreed that once they have owned a smartphone they would never go back to using a regular cell phone. With the smartphone issues being resolved, the participants were enthusiastic about one day accessing their online courses via their smartphones.

**Topic 2 Findings**

Compatibility is a huge issue.

The designers all stated that developing for smartphones is difficult because there are seven operating systems (Android OS, Apple iPhone OS, Symbian OS, Linux, RIM BlackBerry OS, Palm OS, and Microsoft Windows Mobile). Thus, the developers felt that building applications for courses would cost too much since there are no standards across the operating platforms. The developers perceived that smartphone application development would emerge new functionality and usability problems.

The course developers stated that smartphones all had web access. Logically, they suggested that using web standards was the most realistic way of addressing compatibility issues. HTML5, CSS3, and Javascript were brought up by more than one occasion because they are web based computer languages and require only a web browser with internet access to operate them. Using HTML5, CSS3, and Javascript would also be smaller in file size because the interactive and dynamic components of a course could be embedded in the code. On the other hand, HTML5 is not standardized itself, but it will be in the near future. Currently, most browsers are being developed to handle HTML5. The general perception is to develop courses using web standards that are future proof, easy to develop with, dynamic, interactive, and deployable to all web browsers.

Ease of navigation.

With smartphones having limited screen size, the developers felt that easy navigation will be an important design principle to follow. The development of an easy to use navigation system will promote a better course viewing experience without the hassles of constantly searching for course materials. Course content organization will also help students efficiently and effectively navigate the course.

Course content needs to be lightweight.

Along with the smartphone portability, the course content also needs to be portable. The designers felt that containing instruction that is easy to get to, easy to use, effective in teaching, and accessible at any moment, will positively impact students’ experience and add to the value of using a smartphone for m-learning. This idea also means that smartphones should not heavily use processing power or resources to view the course content.

There is a future in mobile technologies.

The designers all felt that there will be a need for developing for mobile devices. A designer happily joked that mobile technology development meant job security. That implication is very true, because designing for m-learning requires new expertise or personnel to effectively develop, administer, and support this new learning environment. In summary, they felt that smartphones will eventually become widely adopted m-learning devices, and that most good designers will have already prepared themselves for it.

**Discussion**

The researcher thought that the emerging themes were relevant and applicable to anyone thinking about developing courses for the smartphone environment. Hopefully, the findings may be valuable to students or instructors thinking about mobile learning in terms of the smartphone. Attempting to deliver courses on the smartphone is a fairly new concept and the feelings towards its use for online learning are mixed. On one hand, the flexibility for students to instantly have access to their online course deliverables may be a desirable draw to mobile online learning. On the other hand, the technology is so new that factors such as cost and non-standardization of devices poses real threats to its adoption. Course developers need to develop courses that are standards based and m-learning friendly.
This exploratory study began with the uncertainty that smartphones were the newest mobile device tool used to access online course content. It was quickly realized that the issues behind using smartphones for m-learning were big enough reasons to not to use them. It is also important to be aware that building courses for the smartphone will require extra time in terms of development, deployment, and support. The researcher recommends that online course development for smartphones be developed according to functional web standards and to be aware that hardware and software issues currently hinder full deployment.

In conclusion, smartphones are being used for more than just voice calls and chatting, they are essentially becoming pocket-sized computers. To further explore this phenomenon, future studies may include measuring the adoption rate of students using smartphones for their online courses. Other studies could also expand on this exploratory study and define more thoroughly the design principles associated with smartphone course development. The potential use of these devices in our personal, work and educational lives are being extended with users wanting and expecting more. Therefore, a mixture of hardware changes and computing standards will no doubt play a key role in one day offering fully online courses developed for the common smartphone.
References


Helping students use their smartphones as resources rather than distractions is a valuable process regardless of a teacher’s content area's plus it’s really fun to explore the apps and programs that are available, and find new ones that meet your needs as an educator. For more, see: 8 Learning Platform Observations, 8 Startup Signals. You can turn Smart Phones into labs that are better than school labs. We are doing that @phonelabsnet. Reply.