ABSTRACT

The purpose of this study is to analyze the method of delivery used in Personalize System of Instruction (PSI). Asynchronous in nature, the PSI model may provide viable alternatives m-learning platforms, while at the same time fulfilling some of the theories of social science research. Learning style types are also presented in this study. A strategic alignment model is measured against the learning style types in efforts to map the feasibility of m-learning in social sciences versus other educational research. In the case of m-learning, stakeholders include but are not limited to curriculum creators, ISPs and those who host mobile sites, streaming content providers, mobile phone users, instructors, educational institutions and mobile phone carriers. Verifying the mobile authenticity of students receiving instruction, and the burden of proof is also presented in this study as it relates to models used in the banking industry.

Adobe, ComF5 and AXMEDIS [1] are a few companies that provide full mobile platform support for multiple mobile based distribution channels. Mobile protocol and the development of mobile applications must minimize frustrations experienced by users. Issues and concerns in this area range from screen size and resolution of content, and the balance of reading text versus seeing live streaming video, all the way to screen scrolling and mobile keyboard functionality. Mobile functionality and student engagement are also mentioned in this study.

Keywords: Mobile-Learning, Personalized System of Instruction, AXMEDIS, ComF5, MSAM Model

INTRODUCTION

PSI, developed by Skinner and Keller (1970) leaves the student in control of the frequency and speed at which they learn. In the case of the educational study on PSI, it was important for the researcher to test the validity of the PSI theory in various environments over a period of time. The initial quantitative analysis involved the results of test scores. Analysis of Variance (ANOVA) was used to assess and compare test scores.

With PSI comes the assessment of human behavior as they access, capture and share information across platforms. Educational models of the past focused on sharing information face to face at set scheduled times. The fusion of PSI and information access alters and in some cases alleviates the need for scheduling information access. Here, customers/students who have the technology, access course content at their leisure and at the availability of their media platform. While there have been noted challenges associated with information access (including server down times, and weak Wi-Fi signals), this has not limited or discouraged the delivery of education. These and other factors enabled the researcher to arrive at the following research question: In what ways do the interview data reporting on the needs for stakeholders in education help to explain the technological preparedness in the delivery of PSI using mobile learning models.

REVIEW OF LITERATURE

Challenges exist with educational models ranging from content to varying delivery systems. Thompson indicates that the fixed and traditional models can come together to create strategic alignment [13]. Educational models like e-Learning are distributed using technology across multiple channels. The traditional classroom is restrictive according to Boyinbode, Bagula, & Ngambi, [13] in that a person has to be in a physical location.

A historical perspective of the United States shows the distribution of education as one that resided with state and local authorities through 1965. With the passage of the Elementary and Secondary School act of 1965, federal government authorities became more involved in the decisions and support of local public schools [4]. It goes without saying that the implementation of any improvements in K-12 education would be distributed with federal government involvement. And while K-12 educational models are not the target of this study, it is the researcher's opinion that they are relevant to moving toward the feasibility of a true mobile-learning model.

Most of what has been called curriculum today is designed around a proven methodology of hours spent in instruction, lab and outside of the classroom. Because of the constraints/ratio associated with instructional to lab hours, post secondary educational institutions are also challenged with the availability of instruction and more over, the availability of the student to learn. To resolve issues with student availability, many for profit schools developed scheduling to facilitate learning around the student's extracurricular activities, family responsibilities and work.

According to Johnson [6] minimal change was reported in writing effectiveness, based on pre and post test during the first two years of college. Further, the study implied that personal study time was one of three attributing factors that could lead to personal growth and development in collegiate studies. This study came in light of a crisis that was declared among American colleges back in 2005 due to the lack or workforce preparedness of students.

The opportunities from these challenges have created a world of e-learning systems, which have been devoted to the development of client server based platforms. Examples of these systems include Blackboard™, eCollege™, Desire 2 Learn™, as well as several popular open sources platforms (e.g. Moodle, a-Tutor, and Sakai, etc…). Another distributive form of education comes from Massive Open Online Courses or MOOC. Here portals for open on-line education have been created. This affords people with global educational access, to what’s considered, some of the best courses taught by prestigious instructors. MOOC based courses do not offer any
form of certification or diploma like traditional educational models.

While there are advocates who propose the implementation of technology in learning environments, the truth is that there is no empirical evidence that supports a significant increase in educational penetration [5]. And yet, in the future of educational models, students will be required to remember less because of technology access (Pew Internet & American Life Project, 2010). Students will however have to devote more time to critical thinking and analytical skills [2]. In a study with students taking both the traditional and PSI sections of a humanities course, results showed that students test scores were higher than those who take traditional courses [12]. Over the years, personalized system of instruction or module based instruction has been used as an assessment tool by a variety of industries such as information technology, human resources training certification, to name a few. However, upon completion of such assessment, there is no guarantee of the critical thinking and analytical skills required to perform a job (R. Johnson, personal communication, April 5, 2013).

The advent of mobile technology further challenges the current paradigms that provide instruction and educational training. The issue of mobile-Learning becomes even more complex when applied to Personalized System of Instruction, or module based instruction. While the dissemination of education can be transported and captured via mobile technology, this researcher recommends the integration of mobile based assessments to evaluate PSI. At this point it is essential to discuss the components and usage of mobile-Learning platforms and features that are conducive to personalized system of instruction.

To begin the discussion, an exploratory study on the use of mobile technologies in medical education is presented to show the strong distinctions between clinical and educational supervision [14]. Of the two distinctions, clinical supervision provided more support to the use of mobile technology than educational supervision. By definition, educational supervision is the monitoring of educators. Most if not all of the educators in the study were medical practitioners, who indicated that their overall usage of mobile technology was minimal. Use is a very important factor, since a mobile device has to be incorporated by the educator. In the proposed medical study, the extent of use was based on access to the technology, the type of device (iOS, Android, Html5, iPad), and the educator's knowledge of how the device is used. Wi-Fi signals and phone coverage by location were also contributing factors to technological access [14].

Clinical supervision deemed to be the best suited for mobile-Learning. Students used mobile technologies “as an information resource tool,” to access instructional media, for the delivery of module based competency assessments, and to support clinical decision making [14]. The overall use of mobile technologies enabled students to develop clinical logs, communicate with instructors and peers, and create a “personal information management” system. The challenges the students experienced with the mobile technologies included “data security, network connectivity, maintenance and interoperability, use of tool, electromagnetic interference, and social acceptability” [8].

The proposed mobile-Learning model for education must interface with cloud computing, according to Rao, Kamar and Sasidhar [11]. The authors indicate that cloud model infrastructure will require users to register for credentialing and authentication. Banking institutions utilize a very similar procedure for online account set up requirements for mobile phones (Narayana, Venkateswarlu, Kumar, Padmavathamma, Sreekanth, Delhibabu, Prasad, 2013). Whereas, the ability to access user phones through push notification requires that the mobile application is downloaded/installed on the device. This usually requires that the phone is GPRS/Wi-Fi enabled; a typical feature with G4/4G based mobile appliances (Rao, Kamar and Sasidhar, 2012). Educational content provider and developers of curriculum should also consider the types of data to be accessed. Examples of this include text, video and audio files (Rao, Kamar and Sasidhar, 2012).

METHODOLOGY

To answer the research question, a sequential explanatory mixed method design was employed. In this study, the quantitative data helped identify the potential technological preparedness of stakeholders to access, share and capture digital content across media. Five main qualitative interview questions were developed and sent via email to explain what stakeholders need to facilitate personalized system of instruction via mobile-Learning platforms. Because of its robust nature, and varying formats (size, audio, video, text), music was identified as the distributed media. The link to a web based survey was disseminated via email to the facilitators of three main online groups. Facilitators then sent the survey link to their groups via Facebook. For the qualitative data analysis, three group facilitators were purposely selected from these groups. Each facilitator, (classified as a stakeholder) participated in the initial 2006 study.

Quantitative Phase

The strategies used to validate the relationships in marketing science include cross-sectional studies, which are described as the process of collecting information once from any given sample of population elements (Malhotra, 2004). An initial cross sectional study was administered to determine the technological preparedness of 7 purposely selected stakeholders. The factors used to measure preparedness came from Malhotra’s study on information access, information capture, and information sharing (Malhotra, 2004). A scatter plot of the survey results provided a correlation of technological preparedness by general demographic factors like age and the technology access/sharing type available.

The researcher created a radial map of the cross sectional scatter plot to adequately capture the system process of technological preparedness through information access, sharing and capture. The derived model represented the interrelationships of the real system process. According to Malhotra, (2004) a graphical model may be best suited in this instance, due to the fact that they are visual. Further, graphical models are used to isolate variables and to suggest directions of relationships but are not designed to provide numerical results (Malhotra, 2004). The components from this study provided the validity needed to expand the research towards an exploratory study that focused on two additional factors from Goldsmith models are used to isolate variables and to suggest directions of relationships but are not designed to provide numerical results (Malhotra, 2004). The components from this study provided the validity needed to expand the research towards an exploratory study that focused on two additional factors from Goldsmith (2000)– behavior and motivation, respectively.

A survey was administered online via a URL. The survey URL was sent in an email to 3 of the 7 purposely selected stakeholders in an email with directions on participation. The stakeholders posted and emailed the survey link with the general email within their social networking groups. From the 1000 potential participants, 132 responded to the survey within the allotted two week window. Of the 132 participants, approximately 42% were under 20 yrs, 30% were
20 – 25 yrs, 11.4% were between 26 – 30 yrs, 3% were 26 - 30, and approximately 9.1% were 31 – 40 yrs. For the purposes of this study, the researcher extracted data relating to mobile information access, information capture, and information sharing.

Qualitative Phase

The results of the qualitative study are seen below. Five questions were provided for the participants via email. A follow up date and time were determined for the virtual interview. One of the interviews was conducted via Skype due to the location of the participant.

The participants ranged in age from 41 to 45 years. All were male. Two of the participants have doctorate degrees and teach in college environments. The third participant is a church pastor. Two of the males were black and one was white. Two of the participants live in states in the southeastern United States. One lives in the United Kingdom. All of the participants are musicians and have the ability to create music. Further all of the participants own at least one Apple OS mobile device. The results of the quantitative survey are included.

Table 1: Qualitative Survey Questions and Responses 2013

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<th>QUESTION</th>
<th>QUALITATIVE RESPONSES</th>
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<td>1. How do we use mobile phone technology to enhance human involvement?</td>
<td>Nigel I use it as a means to get quick response to inquiries. When we capture data via a web form and the person submits their mobile phone number there, we never respond via email. We respond to the mobile phone. That’s because of the speed. If someone has filled in a form and put their phone number down, they’ll respond quicker than the email. Because of that speed of response, we already know that 99.9999% of our competition will not respond in that manner. So we’ve beaten the odds. Kenneth discusses the ability to access material from around the world via mobile technology. He uses the iPad to access musicnote.com or praisecharts.com. Once he purchased it, he could use the iPad to disseminate to the music team prior to rehearsal. The charts get sent in advance, which decreases rehearsal time. It enhances the interaction because it gets the material to them earlier and gives them more practice time. It raises the level of expectation across the board. Raising the level expectation... ---What I think happened is with the initial appearance of this technology and getting access to all this information immediately, teachers felt that students could teach themselves. And the element of teaching got lost. The art of the interpersonal teaching is becoming more prevalent with technology as a supplement. Richard Mobile phones are limited unless you have a larger screen (there is a visual challenge). Used to access resources, threaded discussion, audio book, email exchange, video production.</td>
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<td>2. How can mobile phones foster group interaction?</td>
<td>Nigel The best way that I could say that it has groups come together is by choice of social media. With mobile phones as the vehicle to social media, social media is the marketplace. Kenneth Consider a traditional classroom...there is a survey/website where you can launch questions and students can text their answers and the responses occurs on the screen in the classroom. It tells where the deficiencies are with instruction..... Richard Threaded discussions, mobile conference calling work groups and surveys are ways to foster group interaction.</td>
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| 3. What is the best way mobile phones can be used to enhance the educational experience? | Nigel, I would say the increased ability for apps and phones to be able to house content without streaming. It means making the phones with bigger capacity. Kenneth Tends to only use it to disseminate materials. “I can be more impactful with students one on one face to face. For example, there are piano teachers (for students that moved away) that do Skype lessons. The problem is based on the delay, bandwidth to support the technology.” Richard For the instructor and content developer...I haven’t considered the phone as a means to distribute education. It’s another medium to gain access to curriculum. Audio and Video Lectures can be available. Instructors can facilitate discussion threads and monitor user access/student activity. Being accessible real time is probably one of the better features (depending on
4. What are the threats (if any) to mobile technology as an extension to learning/mentoring environments?

Nigel
For me the biggest threat or the limiter (As I see it) is reliance on an Internet connection. I have a hard drive that is about the size of my phone. Storage in the form of terabytes.

Kennith
It depends/falls on the shoulders of the mentors themselves. If the mentors attempt to use the technology as a replacement for instruction. We'll have a generation of students who get faulty information. If it's used as a supplement to what has already been explained then its a tool immense proportion.

Richard
An interface has to be built. Brick and Mortar professors are more used to standing and doing lectures. A company called Skills Soft has a competency based module training….this works in the corporate environment. Module based instruction is used by universities to help people (like IT folks) obtain certification. In one such school, certification testing is part of the school’s Bachelor of Science program. SAT pre-testing modules also fall under this category.

5. List other Mobile-Learning uses and concerns

Nigel
My phone sweats because of the apps. At any given moment on any given day...I only have 3 pgs of apps...60...

RESULTS

The results of the study explain several things. First, the relative frequency of mobile purchase behavior is a much lower at 3.7% compared to 65% of user, who still use debit and credit cards for the similar transactions. It was also interesting to note that 34% of the participants either never use iPod for downloading, while at the same time, 44% of participants always use their iPods. The same is true when it comes to mobile phone use. In this study, 31% of participants never download files (e.g. music) to their phones, while approximately 35% always follow this practice. The variance in these readings can be attributed to the age of the participants. Because the mean frequencies of the mobile phone and iPod use were close on opposite ends of the spectrum, a polynomial distribution is most feasible in this scenario.

CONCLUSIONS

We derive from this study that Personalized System of Instruction/module based instruction has many benefits as an instructional mechanism. Further, mobile technologies (in general) can accommodate this mode of instruction, but not without the involvement of the Internet as the main distribution house for content. Un-interrupted mobile-learning will be dependent on consistent Wi-Fi access and little interference. The moral of the story lies in the hesitancy of both educational providers and mobile phone users (in general) to embrace the technology.

While it is expected that students will have an easier time searching and finding material via web based platforms (that include mobile portals for access), their ability to think critically could be compromised as a result. For mobile-learning to really work, one could also expect increased responsibility on behalf of educational stakeholders to learn the technology like an expert. Like the Music industry, increased technology use in education (via mobile-learning) will expose the deficiencies/flaws in this area, which may include instructional delivery and methodology.

As curriculum developers and book publishers create educational content, current e-Educational platforms will need a face-lift to accommodate mobile access. This includes the development of screens that are transferrable to “.mobi” format.
The importance of the mobile transformation is paramount as mobile Internet usage is expected to overtake desktop usage by 2014 (FairSearch.org).

Three platforms best accommodate the needs of PSI/module based instruction. They are Adobe Creative Suite, AXMEDIS and COMF5. All of the platforms offer extensive space to house video interaction, live chat and directed social networking that will foster educational growth and development. The issue of security will be one that is phone dependent. BlackBerry™ RIM technology is a leader in the mobile security market, offering firewall protection to its users. Of the phone brands, Android would be considered the least secure, leaving Apple’s iOS brands in the middle. While there is an abundance of discussion about mobile platforms, nothing has been said so far about the departure from the Internet or Wi-Fi use, which is embedded in mobile usage. Further, mobile storage on the device is still in adequate for the potential continual and educational usage at this time. While terabyte drives are about the same dimensions of a typical mobile phone, no one has yet put to market a phone that could accommodate such storage capacity. Storage capacity in this area would diminish the need for web access and cloud storage.

REFERENCES


