Exploring Teacher's Perception and Potential Use of Mobile Learning in a Business School

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ABSTRACT

As the mobile technology evolves, the possibilities for Mobile Learning (ML) are becoming increasingly attractive. However, the lack of perceived learning value and institutional infrastructure are hindering the possibilities for ML attempts. The purpose of our study is to understand the use and adoption of mobile technologies by teachers in a business school. We developed a questionnaire based on current research about the use of technology on higher education and it was used to interview 14 teachers. Participants provided insights about ML opportunities, such as availability, interactive environments, enhanced communication and inclusion on daily activities. Participants also realized that current teaching practices should change in mobile environments to include relevant information, to organize mobile materials, to encourage reflection and to create interactive activities with timely feedback. Further, they identified technological, institutional, pedagogical and individual obstacles that are threaten ML practices.

Keywords

Mobile learning, M-learning, mobile technology, Higher Education, perception, technology adoption.

INTRODUCTION

Along with the evolution and popularity of telecommunications and devices, ML has emerged as an enhanced learning model that would allow people to gain knowledge and to develop skills through electronic materials and activities available anytime and anywhere through mobile devices (Peters, 2007; Singh, 2010). With the success of mobile commerce and mobile applications, the shift to mobility in phones and computing is irreversible. Mobile Internet is growing faster and will be bigger than the desktop Internet once did, due to five converging technologies and social adoption trends: 3G, social networking, video, VoIP and impressive mobile devices (Morgan Stanley, 2009). Almost 74 percent of worldwide population owns a mobile phone and global volume sales of tablets are projected to reach 164 million units by 2014, compared to less than 32 million units sold in 2011 (Euromonitor International, 2011). The worldwide market for ML products and services reached $3.2 billion in 2010 and they will reach $9.1 billion by 2015 (Ambient Insight, 2010). Unquestionably, mobile education presents large opportunities because mobile devices are portable, ubiquitous, easily accessible and used by many people (Keskin and Metcalf, 2011).

BACKGROUND AND MOTIVATION

Over the last years there is an increasing interest on ML around the world on going from academic research to public and private initiatives with high impact on society. With the acceptance of distance education and e-learning, universities around the world launched new projects on mobile learning. For instance, Duke University and Virginia Tech College of Engineering require students to acquire mobile devices; in contrast Wharton in the United States and IMD and IESE Business School in Europe are distributing tablets among participants of their MBA and executive education programs. Companies, such as Nike, SAP, Hilton and Outstart, have used mobile programs to train and support their employees (Corbeil and Valdes-Corbeil, 2007; Heiphetz, 2011; Meister, 2011). It is important here to be clear about what exactly ML contributions that are new and different from previous learning technologies. Pedagogical activities like sharing, exploring, recording, reflecting are possible forms of ML; but what may be new through ML is the way they are integrated, to bring the best possible support to the learning process (Laurillard, 2007). Mobile devices offer new learning capabilities such as connectivity, situated learning, individualized learning, social interactivity, portability and affordability (Murphy, 2011).

However, there is still much to learn about how to use in education. Traditional education is facing new challenges with digital natives (Gen Y), users who grew-up in the digital world (Prensky, 2001). Thus, integrating mobile devices, new resources and new technology platforms at universities produce a mobile environment that generates opportunities and risks on education. The use of ML is expected to increase learning outcomes with the availability, ubiquitous and collaboration features (Aubusson, Schuck and Burden, 2009). Hence, the question raised in this paper is "How to effectively and successfully use mobile learning in Higher Education?"

Bringing an answer to this question would allow universities to use mobile devices to explore learning opportunities and take advantage of mobile technology. The aim of this study is to shed light on this research question, and to formulate a starting point for better understanding teachers' perception and usage of ML in higher education. Without a good ML understanding, lack of support and poor institutional investments on this area could decrease adoption opportunities and may lead ML in education to fail. An understanding of teachers' perception has to be established before considering the use of mobile devices in teaching practices or implementing institutional policies. Thus, we must understand the capabilities of mobile technology and its challenges within universities to offer materials that teachers can experience in their classrooms.

METHODOLOGY

To explore the use of ML in higher education, we developed a qualitative study based on a questionnaire to understand teachers' perception. The questions were administered to teachers in higher education who provided insights about opportunities, factors and obstacles. Responses analysis revealed considerations of use ML usage. Based on the results, implications are discussed and future research directions identified.

Fourteen professors (8 females, 6 males) from a French Business School participated in the study. All of them have a prior experience with Moodle, a Learning Managements System (LMS) developed to create and share learning resources, but only 30% of them have experienced ML at their courses. The sample included associate (92%) and assistant professors (8%) status. In the participants' selection process, we tried to diversify the backgrounds and to include participants with different ML experimentation level. At the beginning, a sample of 16 participants was targeted, as the researchers were contacted by phone or by e-mail, the participant accepted or rejected the invitation.

An exploratory questionnaire was developed based on our understanding of elements that influence teachers' adoption and integration of mobile technology within learning environments. A literature review of ML adoption and exploratory studies on ML reveled that there are particular issues that will influence teachers to adopt and integrate mobile technology in their courses (Aubusson, et al., 2009; Salajan, Welch, Peterson and Ray, 2011; Yeonjeong, 2011). Three general topics are included in this research to understand the perception and possible adoption. First, we attempt to discover important issues regarding the ML perception in relation to opportunities and factors to use ML. Second, we examine some apparent correlations that are influencing ML use. And third, we identify some obstacles or inhibitors to use ML.

Variable		Percentage
Gender	Female	57.1%
	Male	42.9%
Nationality	French	57%
	Other	43%
Area	Information Systems	7%
	Marketing	14%
	Management	21%
	Strategy	21%
	Languages	21%
	Other	14%
Age	30-39 years	36%
	40-49 years	29%
	50-59 years	36%
Years teaching in higher education	1-6 years	28.6%
	6-15 years	21.4%
	More than 15 years	50%

Table 1. Sample profile

	Device description	Personal Use Quantity	Educational Purposes
Tabs	Mobile phone	4	0
	Smart phone	4	1
	Iphone	8	0
	BlackBerry	0	0
Pads	Ipad	3	0
	Kindle	1	0
	E- reader	0	0
	Laptop	5	5
	Touch screens	0	0
Boards	Interactive blackboards/whiteboards	0	0
	Touch screens	0	0

Table 2. Mobile ownership and purpose

The questionnaire was divided in two sections. The first section includes eleven questions regarding their profile as teachers and as mobile users. The second section uses five open-ended questions that are administered to capture individualized and detailed perception of ML. Content validity of the instrument was established by three expert professors who reviewed the items for clarity, accuracy, and appropriateness for ML practices. The responses were captured and examined using the on-line database analyzer Suveymonkey.

RESULTS

Q1: "What opportunities do you see with m-learning and what goals might be achieved using m-learning activities?"

The opportunities to learn can be increased because teaching and learning materials are available anytime and anywhere. In old days teachers were the repository of knowledge and students were passively absorbing it. Nowadays, the respondents face well technically equipped students going to the Internet and finding big amounts of resources related to their classes that can be delivered anytime and anywhere. ML can itself augment learning opportunities because of availability. The students experience constraints regarding their location such as internships, origin, residence, and medical problems and therefore appreciate not to be penalized for personal constraints and be able to access all the pedagogical materials even when they do not attend the class. In areas like foreign languages the accessibility for resources is quite useful because there are different formats available for students. Other respondents pointed out that some foreign students find availability as an opportunity for learning since they can record the classes and can watch the lecture anytime and anywhere on their devices. Finally, one respondent considered space as an opportunity.

Also, it was suggested as a learning opportunity the ability to create interactive environments. Through a virtual situation the students can be in a reflective situation if interaction is involved. "*The students do not want to hear the teacher all the time. Therefore a simulation could give them enough information in a short period of time; working in teams will produce a great learning environment*". For example, in specific areas working with mobile technologies is a daily tool like for Marketing and M-Commerce and finding situations to interact will give more value for students. The students are creating their own personal environments since the easiness to go for a dictionary, social network or a mobile application and test the knowledge, which is a new learning environment. The resources are there and the professor has the choice to give them to the students.

Mobile devices are incorporated more and more on students' daily activities. However some students are not relating learning with a smartphone. They look for concepts in the phone through Wikipedia and mobile practices are relatively new. The ML practices are changing; only few teachers are starting to use ML.

Respondents avoided making comments about the goals they sought using ML. In fact, most respondents did not answer the question or simply made a reference to the opportunities observed with ML. Some indicated that they do not have a specific goal. Those who answered referred active or reflective learning as their goals. Other goal was as an enabler for communication. "*Considering that people is moving, and there are distances and time spent so ML will help the students and the professor innovate and make the communication more time efficient or time effective*".

Q2: "What factors would facilitate using m-learning in your classes?"

These factors are sufficient mobile infrastructure, adequate mobile devices, clear pedagogical objectives, suitable learning materials, relevant training for a busy faculty. An adequate mobile technology is an important factor for using ML. They perceive that the actual LMS is not adequate for interacting with mobile devices. Other issue related with technology is the networking; the wireless network quality is different from one room to another in the campus and they are not confident with it. Another technological issue is insufficient technical staff to create electronic materials and to deliver them to students. Considering that some professors are not media experts, they find it complicated to video-record a class because there are many administrative requests to make before doing it.

A clear pedagogical goal is required in order to include mobile activities at their classes. The respondents find it useful to get materials with mobile devices, but perceived that they are only accessing learning materials instead of getting some learning. Respondents suggested that behind mobile learning materials should be a pedagogical design to make them learn instead of just making materials available for them.

E-learning materials must suit to their classes. There are many learning electronic materials available for students such as articles, videos, digital library. However, respondents find difficult to include them with their actual courses because they are not necessarily conforming to their subject or class format. The respondents considered the creation of new electronic materials to include them at their actual teaching. For example, to measure how much students are learning, on-line quizzes on mobile devices could be useful to give them immediate feedback. Moreover, the cost was an important factor to use learning materials at their classes. Respondents mentioned that electronic materials should be free or at no cost to make them available for students. They disagree in giving an economic benefit for a company.

Finally, to use ML some respondents considered time necessary to take relevant training. Respondents expressed intention for using electronic resources; however they find it complicated creating resources or being more involved on ML practices because at the same time they are teachers and researchers. Others indicated that training courses are desirable to become mobile expert user. At the moment participants know how to create e-learning materials such as quizzes or videos but they need time to develop new materials for their courses.

Q3: "What teaching practices (and skills) should change with m-learning environments?"

The traditional teaching practices needs some changes because they are not suited for mobile device activities. Respondents mentioned as changes in teaching practices relevant information, organization materials, encourage reflection and creating interactional activities with prompt feedback.

Teachers should use relevant information for their classes. With digital literacy, teachers should help students how to find reliable information encouraging and empowering them to use or interpret the information in other form. This practice implies learning about technology and how to use it to become literacy.

Teachers should change the way knowledge is organized and related. Traditionally teachers at the classroom are organizing information and giving it through a lecture or readings in a syllabus. Moreover, there is no evidence about students using teachers' actual electronic resources. Usually students have to prepare or read something before coming to the class in order to have a prior idea. Teachers should to be able to organize the materials, the case studies, the day and the whole subject considering the availability and the objective of learning materials.

Teachers should encourage reflection. Respondents perceived that reflection is important for classes and mentioned that it is quite easy to make the students use technology but it is not easy to use technology to make people reflect. For example, having a face to face conversation with students gives them the opportunity to reflect. There is a questioning about the possibility to reflect with technology. Respondents expressed that it is indispensable to design activities for reflection but new activities requires more time. Teachers should create interactional activities and provide feedback. In a normal class, teachers act as lecturers with the possibility to have questions from students. Respondents prefer to have interesting issues to discuss with actual issues and problems; however, it is difficult and challenging to find the right balance. The students discuss at the class, they appreciate this moment and teachers cannot use mobile technology in the class. With ML activities interaction is important, but is not easy to organize the activity to create interaction. Additionally, providing prompt and extensive feedback requires time; some respondents mentioned that students like immediate response. Additionally, if teachers have a discussion with mobile access they need extra work to correct the errors or deliver feedback; however, they believe it is complicated to monitor the mobile activities.

Q4: "What obstacles you (may) face using ML activities?"

The respondents' answers indicate that it is mainly technological, institutional, pedagogical and personal obstacles that impact on teachers' use of ML activities. In regards to technological obstacles, respondents indicated that they were initially skeptical on ML. The size of the screen and the interface quality were not good enough for interaction, reading or watching a video. But in 2010, they began to realize technological changes on devices and also that more students have the devices at their disposal.

The major institutional obstacles to academics' use of ML include infrastructure, lack of support and institutional policies. Respondents referred to infrastructure as not complicated but not flexible. Others mentioned malfunctions including slow download times, bandwidth and connectivity issues that discourage teachers and students. Sometimes those technological problems produce last minute changes on the class strategy that deject teachers for using mobile technology. Also, the lack of specialized or technical support was mentioned as a constraint since the working hours and support constrain the use of ML.

Respondents also indicated that institutional policies such as annual assessment, workload, accreditation procedures and training represent an obstacle to use ML. In particular, the lack of a system reward from the institution had disabled the opportunity to adopt ML activities. There is an annual assessment that includes face to face teaching hours; however, electronic resources or recorded classes are not included on the assessment and they are time consuming with much back office work behind. Such extra workload is not recognized, especially in financial terms; though, some accreditation procedures are pushing the institution to generate innovative learning activities through technology. Respondents were also concerned about training and persuading people to use ML in classes. There is not a perceived training pathway to come up with new technologies. About training, they indicated that it is hard to convince people to attend the training, therefore it should be useful and relevant.

Respondents also identified some pedagogical obstacles such as information overload, skepticism from students and teachers and learning impact. Given an enormous amount of resources, students are not using mobiles for learning they use mobiles

for a practical or quick search. If the professors are uploading the material for class, the likelihood for absenteeism increases. The respondents indicated that is important to think which materials are on line and which are going to use on a face to face activity. *"At this moment, the student has not expressed a real necessity to use the material on mobile devices".* The class should include something special; otherwise, there is no motivation on attending.

Personal obstacles identified were exposure, technological skills, teachers' role and security. E-learning materials such as electronic lectures involve recording video and voice. Respondents expressed fearfulness about being recorded or exposed since they can lose control about the recording that could be exposed on the web. *"Is possible that what you say and what you do could be recorded and posted on the Internet and it has to be more observed".* Others respondents mentioned that they do not have the adequate technical skills to use and create e-learning materials considering that some of them have a social science preparation. Finally, the material rights' and privacy issues regarding learning materials was exposed. In old days, material rights was something very clear but now teaching materials, which are always copied, are vulnerable and some respondents find out not secure in terms of protecting their work.

Q5. *"Is there any correlation (influence) with the (technological) learning profile?"*

Respondents indicated that students and teachers have certain correlation with age, background, social status (purchase power), learning style and nationality. The age was the most mentioned correlation since they perceived that young people use the latest technology. *"I see the difference between my son and me for tech resources. Young people have self-esteem about how to face technology.* Also, respondents mentioned that young people can read on the screen and on the other side old people likes printed materials. *"Supposedly ours students are in Generation Y".*

Students with an engineering background are more skilled than those on management or social areas. Respondents inferred that every student between 10 and 21 is technologically skilled. *"Even we have a technological student that does not mean that students like mobile learning".* Students are related with society in traditional way. They have student societies, a cafeteria, etc. They have the skills but are not necessarily they are more skilled to have ML. Also engineering students have a structured way for learning and Management students like simulation. Also, it is important for marketing students to understand and to use social networks.

The social status (purchase power) is related with the kind of devices owned by a student. *"Students that do not come from high social level are not well equipped".* Teachers perceived that there are some differences about the purchasing power for a mobile phone and also for the rate plan they are using. *"It depends on the social origin. If they have more money to spend they will have more appropriation depending on parents".*

Learning styles are influencing the learning preferences. Some people likes books, some people likes to learn with series or music. There is a diversity of contents and channels and respondents find interesting since everybody have with different learning styles a different kind of resources. For instance, video is a support and for learning languages because it has subtitles and also students can watch the movement of the lips.

The nationality influences ML since on master courses, American, German, Russian, Chinese, and Korean students are more linked with technology than French ones.

DISCUSSION

Numerous studies have investigated factors that influence academic's use and adoption of technology on education in a widely range of educational contexts. More recently, researchers have specifically focused on ML to understand and analyze students, teachers and institutional perspectives (Gyeung Min and Soo Min, 2005; Liu, Li and Carlsson (2010); Peters, (2007); Suki and Suki, 2010; Uzunboylu and Ozdamli, 2011; Wang, Wu and Wang, 2009). However, there is no research to understand teachers' perception for ML use in a higher education. This exploratory study investigates the use of mobile learning by teachers in a business school as these environments yield opportunities for availability, interactive environments and mobile incorporation on daily activities.

Although education has some opportunities through the use of mobile devices, study results reveal some factors that would facilitate ML use. Two of these factors are related with teaching practices, using clear pedagogical objectives and having suitable learning materials; they assume some changes on actual teaching practices. Respondents identified four primary changes for teaching practices.

First, teachers should use relevant information for their classes. With the increasing amount of resources available on the Internet, teachers need to find relevant resources to include on their classes. This change implies modifying traditional resources into more updated and available ones. *Second*, teachers should change the way knowledge is organized and interrelated. Teachers should be able to organize previously the materials, the case studies and the activities considering the

availability and objective of each learning material. *Third*, new mobile teaching practices should encourage reflection. In traditional environments the opportunity for reflection is well used since the teachers experiment a face to face situation, and is the responsibility for teachers to put students in a reflective circumstance and help them in the process for learning. There is a questioning about the possibility to reflect with technology or in mobile environments. *Fourth*, teachers should create interactional activities and provide timely feedback. Interaction is an important element in education since it promotes communication between teacher and students, between students delivering immediate feedback. However, providing prompt and extensive feedback with ML requires more time.

CONCLUSION

This study indicates that it is predominately technological, institutional, individual and pedagogical factors that impact on teachers' use and integration of ML in a business school. *First*, is important to consider technological obstacles for using ML. For a long time, the size of the screen and interface on mobile devices were not enough to enhance mobile activities. Now, devices are becoming more suitable with bigger screens and capable to interact and read text using a better graphic interface. Moreover, the LMS should be suitable for mobile activities. *Second*, the study revealed that major institutional obstacles for teachers' to use and to integrate mobile technology include infrastructure, lack of support and institutional policies. *Third*, the pedagogical obstacles that influenced teachers' use included information overload, skepticism from students and teachers and learning impact. Considering that materials for the class are on line the likelihood for absenteeism is increased; it is relevant to provide students with information on how to approach ML materials. For this reason, the class should include something special; otherwise, there is no motivation for attending. *Fourth*, personal obstacles identified include exposure, technological skills, teachers' role and security. Teachers expressed fearfulness for being exposed since they can lose control about the recording that could be exposed on the web. Finally, the material rights' and privacy issues regarding learning materials was exposed.

It is important to consider the limitations of the current study when evaluating or utilizing the results mentioned and conclusions. First, this study was an exploratory investigation; the results were based on perceptions and personal use. Furthermore, the majority of respondents are teaching at the same business school.

Based on the results of the current study, we suggest three main research directions. First, it would be useful to explore teachers' perception for ML in other business schools. Do opportunities for ML have different obstacles? For instance, would the interactive environments created with mobile technology have institutional or personal obstacles? Also, we must examine how the creation of new mobile activities will increase students' interaction. For example, an actual discussion in traditional format translated in a mobile scheme; will increase the interaction or it was only be removed from the classroom to a more open space?

Third, the current exploratory study included perceived correlations between the use of ML and factors such as gender, age, nationality and background. Can we identify factors that influence teachers' acceptance of ML? These correlations must be assessed in an additional study to validate assertions. User acceptance technology is an area well researched in information systems. The Technology Acceptance Model (TAM) is a well known model to evaluate individual's acceptance of IT. It assumes that a person's attitude and behavioral intentions toward using a technological artifact will depend on the perception of the user concerning the ease of use and its usefulness (Davis, 1989). Many enhancements have been proposed to the TAM model, and the Unified Theory of Acceptance and Use of Technology (Vanketesh, Morris, Davias and Davis (2003) can be considered as the most general synthesis of these enhancements (Schepers and Wetzels, 2007). In this model, the behavioral intention of the user is influenced by a wide range of factors going from age, gender to expected effort or contextual facilitating conditions. These models have been applied to understand students' ML adoption (Liu, Li and Carlsson, 2010) or faculty acceptance of Tablet PCs in a college of Business (Anderson, Schwager and Kerns, 2006). Since it has been used to evaluate adoption for ML, the UTAUT model could enable a better explanation of ML acceptance and teachers behavior in a business school.

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