

The Role of Mobile Technology and Social Media in Mobile Learning: A Literature Review

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Abstract- *Mobile technology will play a big role in transforming science fiction into reality and provide vast universal learning opportunities. An individual can utilize the internet to build a self-directed learning plan that integrates collaborating with experts and peers throughout social networks and access to many learning resources. Online communities support knowledge exchange and this kind of environments present now and will continue to extend and develop with new and innovative ideas generated in groups of individuals in the same wave. These communities will be incredible places for people to learn and grow. Mobile technologies have attracted the attention of researchers and educators through their potential as learning tools that support and enhance the learning experience. This paper attempts to makes a contribution towards understanding how can learners gain from mobile technologies and social networks in formal and informal learning.*

Keywords: Mobile Learning; m-learning; Mobile Technology; Social Network; Informal Learning.

1 Introduction

Since Tim O'Reilly (2005) announced for the very first time the term Web 2.0 and has demonstrated a new way to deal with the World Wide Web; a radically transform occurred. Nowadays, the expression Web 2.0 is used to describe applications that distinguish themselves from the earlier generations of applications by a number of principles. The motivation of active participation separates Web 2.0 based learning from traditional Web 1.0 learning. For example, in traditional learning management systems, users read web pages and solve exercises but cannot contribute; as well the social interactions are restricted to forums. The power of Web 2.0 together with the social aspect captured by the 'harnessing of the power of the crowds'; these two principles are the most observable and the most analyzed and studied by pedagogical research [1]. As Stephen Downes states, "the Web was shifting from being a medium, in which information was transmitted and consumed, into being a platform, in which content was

created, shared, remixed, repurposed, and passed along"; he emphasizes the constructivist nature of these principles and distinguishes the delivered learning of learning management systems with the learner-centered activities generated by Web 2.0 applications [2].

Due to the extensive use of wireless technologies and the high rates of mobile device adapted, online learning is transforming from desktop computers to mobile devices. Mobile communication technology is considered to be effective in promoting learner motivation and encouraging interaction between learners and instructors as well as among peers in online learning environments. In addition, the capabilities of Web 2.0 tools and services, such as Blogs and Wikis, allow distributing and storing of information facilitated by provided user-friendly interfaces. One characteristic of Web 2.0 services is their values are increased as more people using them. In the case of traditional static website, it does not get better as more people visited it because its contents are statically presented; while with Web 2.0 sites, visitors maintain the site's information, either by constructing the site or piece of it, or by activities used for adapting its content [1].

The use of Internet and Web 2.0 applications are growing rapidly, especially amongst younger generations. In addition, by using Web 2.0 instead of consuming static web pages, learners of today become active by sharing their opinions using different technologies on the Web. Currently, web applications such as Facebook, Twitter, Wikipedia, YouTube, etc. appear to have become part of everyday life and help us to interact, share and contribute to a worldwide universal community. Since Web 2.0 are using for teaching and learning purposes, Stephen Downes named it "e-Learning 2.0" [2]. Consequently, social networks such as Facebook, Twitter, Wikis, Blogs and Podcasts have turned out to be very useful tools that preserve teaching and learning to be more effective.

This paper addresses the benefits of using mobile technology in appropriate contexts. The following sections include a relevant background followed by a review of literature aimed to understand how students can gain from

mobile technologies and social networks in formal and informal learning.

2 Background

2.1 Learning

Learning is the acquirement of new, or the adaptation of existing knowledge, behaviors, and skills. Learning may take place as a part of training, education, or certified development program, however it also occurs informally and socially among peers, or in a casual way. It may be oriented by objectives, aided by motivations, or as a result from more complex activities such as games participation, that is “Learning is a social process that occurs through interpersonal interaction within a cooperative context. Individuals, working together, construct shared understandings and knowledge.” [3]

In general, learning can be divided into formal learning, and informal learning. Formal learning takes place in education and training organizations, leading to recognized certificates and qualifications. Informal learning is a natural addition of everyday life. Unlike formal, informal learning is not necessarily intentional learning, and so may well not be recognized even by individuals themselves as contributing to their knowledge and skills. According to the vocational training policy terminology [4], informal learning is: “Learning resulting from daily activities related to work, family or leisure. It is not organized or structured (in terms of objectives, time or learning support). It is in most cases unintentional from the learner’s perspective. It typically does not lead to certification.” Informal learning, also known as self-directed learning, and since it is more natural, it is accepted and gives a user more flexibility in deciding when, where and what to learn. In fact, most learning occurs as such unstructured processes and is not directed by learning experts. According to surveys taken in USA in 2006, 75% of organizational learning is informal [5]. Furthermore, Informal learning relates with collaborative learning, which supports communication between learners, communities of learners and other forms of shared knowledge creation and sharing.

2.2 Electronic Learning and Mobile Learning

Electronic learning or (e-learning) is not a new concept, but often used to describe many different situations. The predecessor to e-learning was online learning. Online learning was widely talked about in the late 1990's and consisted of using network technology to design, deliver, select, administer and extend learning [6]. Basically, e-learning is a process in which we use electronic technology and internet as medium to access educational applications.

The importance of e-learning is being a crucial support mechanism for educational institutions to enhance the performance of their students and teachers, as well as useful for organizations to enhance the performance of their employees.

On the other hand, Mobile learning, also known as m-learning, started from 1970s and extends broadly in 2000s. Although it has a close association with e-learning, it is diverse in the use of mobile technologies. M-learning allows students to learn with mobile devices or portable technologies without location restriction. That is to say, m-learning is a logical extension of e-learning with the potential to promote expanding to be available anywhere and anytime [7].

2.3 Defining Mobile Learning

The term Mobile Learning, or simply ‘m-learning’, has grown up along with the growth of mobile technology. Although related to e-learning and distance education, it is distinct in its focus on learning with mobile devices. One definition of mobile learning by O’Malley et al (2003) is, “any sort of [technology enhanced] learning that happens when the learner is not at a fixed, predetermined location, or learning that happens when the learner takes advantage of the learning opportunities offered by mobile technologies” [8]. Whereas Ally (2009) believes, “Mobile learning through use of the technology of wireless mobile devices allows people to access learning resources anywhere, anytime and any device. Accordingly, learners can manage what they want to learn and from where they want to learn. Mobile Learning provide to all humans the right to access learning resources to increase their value of life in spite of where they live, their background, and their status.”[9]

While first definition focused on learning that happens when the learner is not at a fixed or predetermined location, the second has promoted m-learning to be “anywhere, anytime and any device”. Further definitions are focused on utilizing learning using mobile technology since “mlearning has attracted a great deal of attention from researchers in different disciplines who have realized the potential to apply mobile technologies to enhance learning” [10]. Obviously, the platforms and devices existing now are more flexible and portable. The providing of unlimited access to content makes m-learning more convenient and valuable. As so the latest devices are designed to be ‘always connected’ to Internet, and along with the use of ‘cloud computing’, unlimited amounts of content directly available to vast numbers of users.

Since 2010, the iPad and iPad-like tablets represent another game change in m-learning. We realized that early smartphones were not really well suited for traditional curriculum delivery, but rather for information delivery and performance support. As well, laptops have the issues of

weight and battery life. Beyond doubt, the latest tablets and ideas of 'always on', 'the app', 'the cloud', and 'Application Store' make mobile learners always motivated by the unlimited educational resources. In this paper, we will apply simple definition for m-learning: m-learning is a ubiquitous and self-directed learning activity, occurring during the use of a mobile device which is supported by an appropriate mobile platform, application and a pedagogical approach.

2.4 The shift towards Mobile Learning

The vision of mobile learning presented by the majority of authors currently writing in this field seeks to enable "anywhere, anytime, and any device" portable and personalized learning. The current movement towards mobile learning was identified by Wagner (2005) as she predicted that mobile learning will be the trend of future education which allows learners to have different and rich learning experience. Moreover, Wagner (2005) assumes that, when using m-learning in appropriate contexts, it will facilitate communication, creativity and collaboration; therefore, "the success of mobile learning will ultimately revolve around a mosaic of rich converged experiences. These experiences will rest, in turn, on a foundation of converged network and device technologies, wireless services, rights management, content management, search management, and transactional processing power." [11].

While coming across the variation between e-learning and m-learning, some researchers raised their concerns towards more pedagogical contexts. For example, a study conducted by Sharma & Kitchens (2004) shows that e-learning focuses on texts and graphics based instructions, while m-learning give emphasis to voice, graphics and animation based instruction. They also pointed out that e-learning usually occurs in home, classroom or labs using a computer, however, m-learning allows learning to happen everywhere using mobile devices [12]. Since the experiences provided by mobile learning include portable and personalized learning experience which enable learner to learn "anytime, anywhere and any device" this can be perceived also a revolution of "just-in-time" and "just-for-me" information delivery [11].

The benefits of m-learning have features for both formal and informal learning environments that support self-directed and experiential learning through facilitating community work. Despite the fact that these benefits are remarkable, it is important to know that m-learning also face challenges for educators and learners in a similar way. Indeed, "The challenge for the educators and technology developers of the future will be to find a way to ensure that this new learning is highly situated, personal, collaborative and long term; in other words, truly learner-centred learning." [13]. On the other hand, the ubiquitous of the smartphones and later of tablets are driving the interest in m-learning. While mobile devices are familiar, reachable,

and connecting learners all the time, and along with the innovation of new mobile devices such as smartphones, tablets and wireless network technology, m-learning has been broadly adopted in many educational organizations as informational practice.

Nowadays, the educational environment is moving toward mobile learning, seeing that numbers of schools that are ready to offer courses using mobile technology are increasing. Therefore, the m-learning approach would require alteration in pedagogy, educational roles, curricular content and classroom practices [12]. On the other hand, the combination of mobile devices into the course outline needs a change in teaching approaches and strategies. A survey conducted by Corbeil and Valdés-Corbeil (2007) for instance, with instructors to find out among other things their readiness to move from e-learning to m-learning; the majority of participants stated that they were ready, although they were not yet integrating mobile technologies into their teaching activities [14]. This rise of new educational structure, weather from a pedagogical or a technical point of view; has resulted in a quest for new learning methodologies and frameworks. These transforms involve everybody "Since the scope of the change exceeds personal and interpersonal learning activities to include larger scale organizational and societal change, additional theories are needed to explain change, to plan interventions and to develop policies" [15].

2.5 The changes in learners' characteristics

Today's students are described to be digitally literate as they used to live and learn in a digital environment. They tend to be 'always on', or with communication with friends and classmates all the time through a combination of cell phones, instant messaging (IM) and emails. Mobility is another feature of today's students, either physically or virtually, in which they tend to be community-oriented.

The changing dynamics of learners and their characteristics have been discussed by several researches. According to Sheahan (2005), we can currently specify differences between the capabilities and preferences of Generation X and later generations [16]. Furthermore, Oblinger (2004) addresses the unique characteristics of the "millennial student" as being: digitally literate; always on; mobile; experimental; and community-oriented. "A new generation of students is entering higher education a group called the 'Millennial' or the 'Net Generation' were born in or after 1982 and exhibit different characteristics than siblings who are just a few years older" [17]. According to Sheahan, "technology and gadgets are critical to the way these newer generations define themselves", thus Generation Y and beyond are especially positive towards adoption of new technology [16].

3 Mobile Technologies and Learning

With the advent of mobile communication technologies, Mobile Learning (m-learning) is relatively new type of learning which allows people to learn across context and without restriction of location. M-learning is now perceived as the extension of e-learning with the added value of enabling learning anywhere and anytime. It is found that the latest mobile technologies and Web 2.0 applications are grown rapidly to support m-learning as proven in many successful cases. The literature review presented here reveals some of the current trends of mobile technology as well as identifies several key areas of Mobile Learning endeavors by means of online communities and social networking.

3.1 Current trends in Mobile Technology

Nowadays, when we think about mobile learning, we think about smartphones and tablets. The latest release of the iPad and similar tablets is a milestone in mobile technology, and has created a major shift in education. In 2010, when the iPad came, universities and schools began to see the iPad as the device that would move classroom education to the digital age. Even though mobile devices of all kinds have played an important role in the mobile learning, educational apps offered mobile learning the required push needed to move from concept to classrooms.

According to Tim Cook (2011), the CEO of Apple, “Last quarter, we sold more iPads in K-12 than we did Macs. To do that in just five quarters is absolutely shocking. We never would have predicted this”. In actual fact, the arrival of the iPhone has maximized the industry of smartphone apps. For instance, iTunes alone now sells over 500,000 apps. Schools have already started implementing mobile learning projects using iPhones, iPad and educational apps in order to extend student’s learning environment and engage them on the devices. It can truthfully be said that, the availability of well designed educational apps in Apple App Store, has made unbelievable opportunity for the mobile learning for all ages. Along with a lot of provided authoring tools, educators feel that tablets will change education because they can facilitate lessons design and assist the achieving of educational objectives.

In 2007, Apple created iTunes U service to manage, distribute, and control access to educational audio and video contents and PDF files for students within a college or university as well as the broader Internet. The member institutions are given their own iTunes U site that makes use of Apple’s iTunes Store infrastructure [18]. Several studies have stated that lecture podcasts lead to a better and more effective learning. For instance, McKinney et al. (2009) examined the effectiveness of podcasts on the basis of a

lecture. The test participants used iTunes U for download educational podcasts and use them on their iPod Touch devices. They obtained significantly better results than the group who physically attended. The best examination results were achieved by the students who took notes and listened to the recording several times [19]. Moreover, Fietze (2010) has performed a survey aimed to describe students’ usage behavior and their assessment of podcasting. He mainly surveyed students with no experience in the use of podcasts. The primary intention of the students is to prepare ahead of written examinations. The survey revealed that more than half of the students consider the chance to use podcasts to be no substitute for attending lectures. Fietze also identifies the success factors of lecture podcasts, and provide evidence that podcasts helped to understand the contents of lectures better and more effectively. Once more, students who do not use lecture podcasts state that they have difficulties in learning [20].

There are many features that make the iPad a very powerful learning device. Firstly, the usability of the touch screen of the iPad has extended Human Computer Interaction (HCI) in a way that emulated human gestures. It enables intuitive touch to interact to get straight into the action. Secondly, the iPad does not enable users to read from several sources at the same time on a single screen through windows; while this perceived as a drawback, however as a learning tool, the iPad’s flat interface reduces elements of interruption and potentially enhances user orientation to a specific task and educators often prefer mobile devices without distracting features like messaging and phone calls. Another feature is using iPad as book reader, as many students might buy the iPad for its e-reader capabilities alone.

Nowadays, educators are emphasizing the need for learning to be self-directed and collaborative. Mobile phones and digital whiteboards add a level of interactivity, but not a lot of computing power, and a laptop is not always convenient especially for students of small ages. Moreover, the shift from open web browsing to specialized apps was a practical improvement driven by the Apple model of mobile computing. The iPad influence this trend by providing personalized choice of content which is a huge benefit for learners.

3.2 Social Networking

According to Tim Berners-Lee, “The basic idea of the Web is that of information space through which people can communicate, but communicate in a special way: communicate by sharing their knowledge in a pool. The idea was not just that it should be a big browsing medium. The idea was that everybody would be putting their ideas in, as well as taking them out.” Since then social networks and social communities are growing rapidly as they aim to connect individuals with similar interests to make their life

style better. Stephen Downes also declared that “Web 2.0 is an attitude not a technology. This means there is no technological revolution, it is a social revolution” [2].

Social Network can be defined as a tool that allows people to communicate their opinions online. A social network consists of users who collaborate and share, using the Internet, which brings about online communities. The motivation that drive a user belongs to social networks is the need to share and meet others with a similar domain of interests. Simultaneously, group effort is an excellent way of reaching information and knowledge. Furthermore, social networks are type of virtual community that has grown to be an essential component of recent culture. Nowadays, social networking services have been widely adopted by billions of users all over the world. The trend today is to be in close communication with others through Twitter, MySpace, Facebook and other social networking services. The extensive use of Facebook is not only due to its popularity; but also by the support from various mobile devices equipped with web browsers, and some are even equipped with dedicated application software exclusively for accessing Facebook, such as iPhone, iPad, and many Android devices. The support of Facebook by these mobile devices promotes the use of Facebook for educational purposes. However, unlimited access to information exchange can involve some risks, for example, there is a possibility that a social network is flooded with unneeded information, and to avoid this, or at least to limit the possibility of reaching poor data, rating and annotating shared resources were introduced [21].

3.3 Pedagogy in Social Networking

Much of the literature on mobile learning emphasizes the effectiveness of mobile technology joined by social networks in creating real learning opportunities, at the same time social networking websites have grown to be integrated into the people way of thinking, acting and communicating to each other. The integration of mobile Web 2.0 social tools built for smartphones can facilitate social constructivist pedagogies [15]. Cochrane and Bateman (2010) provide guidelines for implementing m-learning built on the foundation of four years of running mobile learning project that was aimed to evaluate pedagogical affordances of mobile Web 2.0 tools. The students feedback illustrate that mobile Web 2.0 pedagogical affordances have transformed pedagogy and facilitated student engagement in a variety of course contexts [22]. Furthermore, a research on the use of social networking tools in m-learning environments was carried out by Corbeil and Corbeil (2010) derive that social networking applications are beneficial for constructing dynamic and participatory m-learning environments that can engage learners to be active creators and consumers of learning materials. In addition, they found evidence that social networks support steady and shared

communication between the learners, the educators and the content [23].

The social environment is changing as a result of supporting of social networking by mobile technologies. According to Siemens (2004), as the social environment changes, learning needs of the student changes, and instructional methods must changes as well, because “Learning needs and theories that describe learning principles and processes should be reflective of underlying social environments.” [24]. As a result, powerful structure for learning starts to emerge. An integration of ideas happens as local learners participating in different virtual communities carry ideas back and forth between those communities and their local ones [25].

3.4 Microblogging and Mobile Learning

Microblogging is a further friendly form of mobile social networking. Learning of a foreign language presents an example of applying connectivism theory [26] seeing that learning is an activity that happens in a social environment. In the traditional educational system teaching usually means the knowledge is transferred from the educator to the learner, rather than the active participation. Thus, the active practicing outside the classes often did not take place. In addition, the students often were too shy or faced the lack of vocabulary when they were talking to their teachers. In fact, Microblogging social networks can come over all these barriers, and facilitate learning of foreign language due to the large community of users in which the learners can observe communication of native speakers and practice by communicating with them. Ullrich et al. (2008) describe one of the first uses of microblogging for language learning. Their research aimed to address how to enhance the students’ active participation for English learning as a second language. The researchers prompted the students to create accounts in Twitter to follow each other, and then the students were told to post at least seven tweets per week and to read the tweets from the other students. Before the experiment, the students did not find the time to practice English; but with Twitter, they had the free choice of time for doing so. The researchers observed the communication of the community and ran a final questionnaire with the participants showing that the introduction of Twitter motivated the active participations of students given that 94% of the students stated that they felt their English had improved. Besides, about 50% of the students felt comfortable enough to communicate with native speakers. In view of the fact that Twitter is an open community where messages read by non friends as well, so the students were got in touch with outer users among them native speakers of English [1].

Moreover, microblogging can be used for enhancing in-class discussions. In large classes the teaching options is often limited to lecturing, which is not the best teaching

technique. The Twitter experiment at the U.T. Dallas clearly reveals how Twitter could be used as an improvement to traditional discussion formats and to enhance student participation comparing with pure lecture-style classes [27].

3.5 Wikis and Mobile Learning

Wikis create a unique situation where learners are not writing to communicate with their teacher like in a traditional learning environment but students are rather writing to communicate with their peers [28]. The responsible use of a wiki helps shift the responsibility from the teacher to the learner. This shift has the potential to make learning more orientated and self-directed. Wikis also potentially offer those who are not comfortable with speaking in front of the class an opportunity to participate and voice their opinions online [29]. The collaborative dimension of wikis allows students to work together to build, create, and develop content on the web, giving them a sense of how writing can be performed in collaboration. Besides, wikis can be used in project development with peer review, as a group authoring tool to track a group project, to collect data for a class project, for teacher evaluation, and for tracking research groups. Whereas a greater sense of knowledge sharing is achieved, then community is developed and communication amongst the users is improved [30].

The literature reveals that published material relating to wikis in education mostly seek to promote positive elements of use [28] [30] [29]. A study conducted by Laughton (2011) to find out whether a wiki can be used as an alternative to a learning content management system (LCMS) proved that the wiki could be considered as a useful alternative to a LCMS. The LCMS was favored over the wiki on a number of aspects but features of the wiki made it ideal to enhance collaboration amongst learners which makes it an ideal tool to support learners to learn from their peers [28].

4 Conclusions

Students from different ages have been one of the earliest and most active groups of computer users as many of them grew up with computers as an integral part of their learning experiences. Nowadays, cell phones are a very important part of the field known as Mobile Technology, which includes cell phones, smartphones, tablets such as iPads, and many other devices.

The review of literature mentioned earlier makes a contribution towards understanding how students can gain from mobile technologies and social networks in formal and informal learning. Mobile technology has unlimited potentials for education, social networking, and personal

productivity. The Internet accessibility and data capabilities of the mobile devices expand traditional classroom borders and move the classroom outside of the sense of location and time. Since, social presence is an important factor of community construction; mobile devices allow people to share information to increase their social presence regardless of their location or time. With these technologies, people are able to contribute to their online presence at any time. The very mobility of mobile technology allows learners to roam and discover ideas freely without restriction and to manage knowledge wherever they are. In spite of the benefits of using mobile technology in appropriate contexts, the majority of educational institutions have yet to include mobile technology as a fundamental part of educational syllabus. However, mobile technology is quietly gaining a place among educators as an effective tool for bringing communities of students together on the way to empower collaborative learning.

In conclusion, mobile technology has the potential to change learning and teaching as we have known it. The use of this technology is capable to transform students to become informal learners for a lifetime and without doubt, education stands on the edge of change brought about by mobile technology.

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