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CHANGING PARADIGMS OF LEARNING THROUGH MOBILE LEARNING

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Abstract

Mobile learning is a new research area that has become an emerging tool for our education system. It enhances the overall learning experience of our students and teachers. This paper discusses the background of mobile learning and evolution of mobile learning. The paper highlights the factors influencing mobile learning, the benefits and challenges of mobile learning in our educational environment. The paper also presents the character tics of mobile learning, technologies used for mobile learning and educational applications of mobile technologies. Conclusion and recommendations made.

Keywords: mobile learning, e-learning, mobile technology, distance education.

Technology today is turning the old learning techniques on their head, unearthing several new dimensions of learning for students. Smart devices and mobile phones have completely taken over our lives, right from entertainment and communication to the way we learn. Mobile devices are becoming increasingly ubiquitous; many researchers have incorporated the technology into their teaching and learning environments. Teachers need a solid theoretical foundation for mobile learning in the context of education and move guidance about how to utilize emerging mobile technologies and integrate them into their teaching more affectively. Mobile learning or m-learning refers to the use of mobile or wireless devices for the purpose of learning while on the move. Peter (2007) viewed mobile learning as a useful component of the flexible learning model. It was a subset of e-learning, a step toward making the educational process "just in time, just enough and just for me" (Peter, 2007). According to Diez, Valencia & Bermudez (2017) mobile learning is defined as the use of mobile devices to support the teaching- learning process. The potential of the use of mobile devices in education lies in their main characteristics which are the mobility they allow, ubiquity, lightness, low cost, and connectivity (Arian, Hussain, Rizvi & Saleem, 2019). In this way, m-learning contributes to the transformation of teaching practice since it is based on the student- based learning, where the teacher acts only as a guide to learning. Mobile learning is the ability to provide educational contents and resources on personal pocket devices such as smart phones, tablets, PDAs, ipads, mobile phones etc (Ligi & Raja, 2017). M-learning is defined as learning multiple contexts, through social and content resources, using personal electronic devices.

Mobile learning is the use of mobile technology, either alone or in combination with other ICT, to enable learning anytime anywhere at their own pace. The use of mobile technologies can help today's educators to embrace a truly learner centered approach to learning. Learning can reveal in a variety of ways: students can use mobile devices to access educational resources from various links, create contents by themselves, and connect with others of share the resources, both inside and outside classrooms. Pinkwart, Hoppe, Milrad & Perez, (2003) define mobile learning as e-learning that uses mobile devices and wireless transmission. Quinn (2000) defined M-learning as learning that takes place with the help of mobile devices, or the intersection of mobile computing and e-learning. The term mobile learning refers to the use of mobile and handheld IT devices, such as mobile telephones, laptops, PDAs and tablets, PC technologies, in training, learning and teaching (Sarrab & Laila, 2012).

The Evolution of Mobile Learning

Mobile learning was given by Alan kay in 1970s. He joined Xerox Corporation's Palo Alto Research Center and formed a group to develop "***Dyna book***" which is a portable and hands on personal computer. It aimed to let children have access to the digital world. This project failed eventually due to the lack of technological support at that time. On 1994, first smart phone, IBM Simon, was created by Mitsubishi electric corp. It was defined as a handheld personal communication. From then on, technology companies started to design the so called "smart phones". The creation of smart phones provided the platform for mobile learning and current mobile device innovation pushed mobile learning to project and research status (Maxwell, 2006).

Factors Influencing Mobile Learning

There are considerable factors that motivate learners to use mobile applications. Ligi, & Raja (2017) classified them into three main categories.

Features of the devices

It was further subcategorized into three aspects namely: usability, functional and privacy**.**

***Usability*:** From the usability aspect, m-learning, tools are small, light and portable (Cavus & Ibrahim, 2009). These features make the learners feel at ease as learning is no longer constraints to the classroom with bulky backpacks containing piles of books and other learning materials.

Functional: Functionally, the device will help the learners to quickly search such information. It is a learning model that allows the learners to gain learning materials anywhere and anytime.

Privacy: It offers the learners a sense of privacy. It provides the private virtual world to the learners that make them feel safe and motivated. The learners can access information and download indecently from other learners (Moussa, 2003).

User's expectations

It is important to allow learners to exercise more control over their own learning, the learners are more likely to attend to learning experience if they are encouraged to take a more active role in their learning. M-learning opens up the opportunity for the learners to be at the centre of the learning process, play an active role starting from determining their goal until the evaluation stage (Ligi, & Raja, 2017).

Pedagogical Advantage

Some of the pedagogical advantages in mobile learning are:

Flexible learning: M-learning opens up more opportunities for learning to take place regardless of place and time.
*Collaborative learning***:** It involves inclusion and allow for more opportunities for participation and as a result, learning becomes more successful.
Blended learning: It combines classroom instructions with M-learning to enhance and maximize the face to face and online methods (Cavus & Ibrahim, 2009).

Benefits of Mobile Learning
According to Masoud, Masoud, Vahid & Ali (2011) mobile devices are useful in education and teaching aids and also as learning support tools for learners. Such benefits/disadvantages are:

- Learners can interact with each other and the facilitators.
- PDAs or tablets holding notes and e-books are lighter and less bulky than bags full of papers.
- It is possible to share assignment and work collaboratively.
- The classroom is everywhere and modern workforce is dispersed, allowing for a wider reach.
- Content interactions can be personalized to facilitate motivation and engagement.
- Assist learners with some disabilities.

Disadvantages of Mobile Learning

- There are limited storage capacities for mobiles.
- Batteries have to be charged regularly, and data can be lost if not done correctly.
- Small mobiles and PDA screens limit the amount and type of information that can be displayed.
- Lack of common operating system.
- Less robust
- Devices can become out of data quickly.

Characteristics of Mobile Learning
Persona (2019) stated the characteristics of mobile learning as follows

- It can get access to information and educational experience
- It is supported by portable devices
- Exchange of information can be private.
- The cost of mobile learning is relatively low.

- It is easy to access all kinds of information.

Technologies Used For Mobile Learning

Some of these technologies are:

SMS: Short message service allows users to send or receive messages of up to 160 characters.

MMS: Multimedia messaging service serves the same purpose as SMS but allows the inclusion of graphics

WAP: It allows users to access the internet via their WAP enabled mobile phones.

GPRS: An always on internet connection for mobile devices that provides greater speed of connection.

Bluetooth: A short range wireless connection. This enables PDAs to pass messages to and from other mobile devices (Masoud et al, 2011).

Other technologies include mobile phones, smart phones, PDAs, MP3/MP4 players, mini-notebook or net books (e.g. Asus EEE) voting devices and specialist portable technologies used in science labs, engineering workshops or for environmental or agricultural studies.

Educational Applications of Mobile Technologies

A variety of educational applications with mobile technologies were revived. For this purpose, a conceptual and pedagogical framework was generated based on high versus low transactional distance and individualized versus socialized activity. First, *activity* is conceived as a unit of analysis. Since transactional distance theory considers a course or program to include several lessons this made it difficult to decide the transactional distance for the course as a whole. For example, the presentation of information is likely highly structured, while questions for discussion require high dialogue process, but both of these activities are typically course components. As a result, a course including several activities with different degrees of transactional distance cannot simply be categorized as either high or low transactional distance. Thus, by confining the unit of analysis to "activity," it is easier to determine to what extent transactional distance can exist because the activity is a "minimal meaningful context for individual actions" (Moor, 2007). Second, individualized and socialized activities are *mediated* by communication technology which is one kind of cultural-historical artifact in activity theory. As Kang & Gyorke (2008) point out, both transactional distance theory and activity theory consider mediation to be important. Thus, with "mediation" at the center of the framework, individualized activity at one extreme indicates a form where a learner is isolated from communicating with other students, and socialized activity at the other extreme indicates a form where students work together, share their ideas, and construct knowledge. At the same time, activities are mediated by the rule which can be either highly structured with fewer

dialogic negotiations (high transactional distance) or loosely structured with more free dialogic negotiations (low transactional distance). As mentioned above, mobile learning is "mediated learning by mobile technologies" (Winters, 2006) and the mobile technologies uniquely support students' learning both collectively and individually (Koole, 2009). In placing high or low transactional distance on the *y* axis and individualized or socialized activity on the *x* axis, the framework generates four types of mobile learning activities.

Third, the dualism of *individual* versus *collective* (or social) is a dichotomy, but it is also something to be connected and balanced. Activity theory has attempted to transcend the issue of dualism in such pairs as individual-society, subjectivity-objectivity, agency-structure and psychological-social (Roth & Lee, 2007, Watson & Coulter, 2008). However, according to Garrison (2001) drew close to Dewey's theory of transactional coordination, but Dewey pushed his functionalism beyond describing "inter-actions" to a theory of "transactions." There are similarities and differences between the approach of activity theory and the approach of transactional distance theory derived from Dewey's work. Activity theory is an analytic framework for understanding an individual's (subject) actions on learning material (objects) mediated through artifacts, interacting with a community, moderated by a set of rules, and distributed by a division of labor. It forms a part of the basis for transactional distance theory, which is a framework for understanding the relations of key variables (structure, dialogue, and autonomy) in the context of distance learning. Above all, the distinction between individual and socialized activity is a generally understood and accepted categorization; for example, Keegan (2002) stated that distance learning has two forms, individual and group learning. The four types of mobile learning generated in the context of distance education include (1) high transactional distance socialized M-learning (2) high transactional distance individualized M-learning (3) low transactional distance socialized M-learning and (4) Low transactional distance individualized M-learning (Park, 2011).

Type 1: High Transactional Distance and socialized Mobile Learning Activity (HS).
A mobile learning activity is classified as this type when:
The learners have more psychological and communication space with their instructor.
The learners are involved in group learning or projects where they communicate, negotiate and collaborate with each other.
Learning materials or the rules of activity are delivered from the predetermined programme through mobile devices.
Transactions mainly occur among learners and the teacher has minimal involvement in facilitating the group activity.

This type might replace the traditional technology – mediated classroom group activity where students in a group or pair conduct given tasks.

Type 2: High Transactional Distance and Individualized Mobile learning Activity (HI)
A mobile learning activity is classified as the type 2 when:

1. The individual learners receive tightly structured and well organized content and resources (e.g. recorded lectures) through mobile devices.
2. The individual learners receive the content and control their learning process in order to master it.
3. The interactions mainly occur between the individual learner and the content.
   This type demonstrates an extension of e-learning which allows greater flexibility and portability (Beckmann, 2010).

Type 3: Low Transactional Distance and Social Mobile Learning Activity (LS)
In this type, individual learners interact both with the instructor and other learners as they use mobile devices. They have

1. Less psychological and communication space with the instructor.
2. Loosely structured instruction but
3. Work together in a group as they solve the given problem and try to achieve a common goal.
4. Engage in social interaction, negotiation and frequent communication naturally.
   This type demonstrates the most advanced forms in terms of the versatility of mobile devices and learners' social interactions.

Type 4: Low Transactional Distance and Individualized Mobile Learning Activity (LI)
This type of mobile activity refers to
Less psychological and communication space between instructor and learner.
Loosely structured and undefined learning content.
Individual learners can interact directly with the instructor.
The instructor leads and controls the learning in an effort to meet individual learner's needs while maintaining their independence.
This type 4 shows characteristics unique to mobile learning that support blended or hybrid learning.

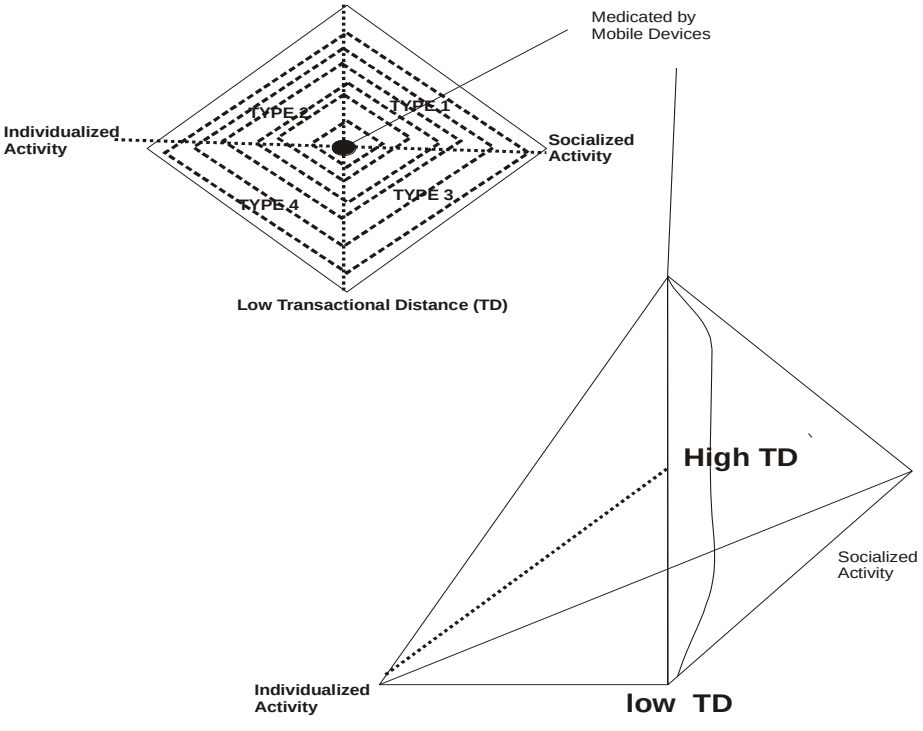

Fig 1. Four types of mobile learning: A Pedagogical framework (Park, 2011).

Conclusion

The evolution of technology and the development of mobile applications in the last few years have been nothing short of spectacular. The flexibility, cost benefits and effectiveness of mobile learning further hold great potential for the future. Mobile learning in education comes up with a distinct approach that helps address several of the common educational issues seen in other traditional modes of learning. The evolving technological landscape and tools have set the stage for learning that can harness the speed for ubiquity of digital capability. Learning through mobile devices and other digital means allows students to have a more personalized and accelerated learning experience that gives them the power to unlock their true potential.

Recommendations

The following recommendations were made:

The educational institutions must take responsibility in sending a multimedia message to M-phones to trigger and motivate learners.

Government should provide internet access and suitable technologies in delivering an equitable educational experience.

There is need to connect as many students as possible with the necessary technologies to make mobile learning a possibility

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