

## **Mobile Learning Pedagogy**

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### **Abstract**

The excitement created by the possibilities inherent in learning through mobile devices without sufficient attention to the pedagogy needed to support mobile learning poses challenges for those who are charged with educating and training the next generation. The desire to adapt learning environments to current technology has always existed. From the technologies of yesteryear to the mobile technologies of today, successful student engagement should rely on the context instead of the tools. The evolution of mobile tools for learning becomes mobile centric when the emphasis is on the tool, and pedagogy becomes incidental. Although the use of mobile devices has increased dramatically in education sectors, nonetheless, there has not been a corresponding increase in mlearning scholarship regarding pedagogical approaches. Instead, research and scholarship lean towards investigating the design of the technology as a learning tool. This paper provides a review of mobile learning pedagogy, identifies developing frameworks for mobile learning, and considers the influence mlearning is having on education. Worldwide access to mobile technology continues to grow and at some point will mature. Therefore, to support faculty and those who design instruction for mobile learning environments the development of comprehensive theoretical foundations is needed. Developing a sound pedagogy for mobile learning has worldwide implications.

**Keywords:** Mlearning, Mobile Learning Environments, Pedagogy, Affordances

### **Introduction**

Technology has always been intertwined with education, promising to provide the latter with newer and better tools to improve the educative process. However, the tendency to embrace the tool, such as the smartphone, as a quick-fix to problems in education may not show a deep understanding of the issues. Current constructions of knowledge in relation to student interaction with technology help to confirm the view that the profession of teaching can be reduced to a series of routine processes and tasks that can be scripted, mechanized, and delivered better and more efficiently via technology (Phillip & Garcia, 2013). The fundamental view of teaching as an art and a science is being challenged. The art of the teaching profession is considered as inconsequential, surpassed by the science of technology. This article discusses the definition of mobile learning, reviews the developing frameworks for mobile learning pedagogy, and considers how mobile learning may be poised to transform education.

### **Background**

Throughout the history of distance education, newer technologies have garnered their share of educators as converts. They often pledge allegiance to the technology and redesign their learning activities to deliver content by means of the technology (Moore & Kearsley, 2012). There is plenty of evidence that newer technologies can help to draw out the learner—readying students to solve yet unforeseen problems that will be faced in the future (Craft, cited in Bass & Good, 2004). This is often

in opposition to the idea that the purpose of education is to “preservation and passing down of knowledge and the shaping of youths in the image of their parents” (Bass & Good, 2004, p. 162).

As one of the current technology of choice, mobile technology offers data, voice, and optics that are accessible through portable handheld devices such as mobile phones, smart phones, and PDA’s (personal digital assistant), to name a few. However, the devices in and of themselves are unable to train or mold students. Yet, research efforts tend to focus on the tools instead of the process of education.

Educators and those charged with educational responsibilities are often enticed into believing that the device alone can transform learning environments for the better, exhibiting the same behaviors seen with earlier adoptions of technologies. The view that learners are singular objects is in opposition to the view that learners are social beings that thrive in communities of learning and whose character is shaped by the human connection. Bass and Wood (2004) content that the constant tension between the two opposing views causes unnecessary shifts in curricula and the accompanying new materials purchases.

The ubiquitous nature of Web 2.0 technologies and the popularity of social networking sites have only served to increase the accessibility of mobile devices which have become more common, dynamic, and promising to many educators (Park, 2011). For certain, mobile devices in the hand of the learner allows for the process of discovery to continue beyond the traditional learning environment at the learner’s own pace and in their chosen space. Mobile learning extends the concept of learners being in control of their learning by enabling the means to access information in the forms of just-in-time, just-enough and just-for-me (Traxler, 2007). In fact, it is the learner who extends the mobile centric language that is present in learning environments and serve to reflect their mindset, behavior, and practices. In the mobile learning era, terms like “spontaneous, intimate, situated, connected, informal, lightweight, private, personal etc. are used to characterize the context” (Laouris & Eteokleous, 2009, “From e-learning to m-learning, para. 1).

Yet, the terminology defining mobile learning (or mlearning) is confusing; which inadvertently challenges researchers who are trying to provide sound mobile learning theories. The existing definitions of mobile learning are different and often depend on the contextual emphasis of the author (Prieto, Migueláñez, & García-Peñalvo, 2014).

### **Defining Mobile Learning**

The existing inconsistency in describing mlearning is often due to the lack of a uniform definition, which makes comparative analysis difficult. Regrettably, the practice of describing mlearning by using the characteristics of the mobile device is a collective norm in mlearning scholarship and research. Moreover, descriptions generally only consider the “nexus between working with mobile devices and the occurrence of learning: the process of learning mediated by a mobile device” (Kearney, Schuck, Burden & Aubusson, 2012, Background, para. 1).

Using critical reflection, Brown and Mbatl (2015), attempt to define mlearning by what it is and is not, at the same time dispelling some of the myths related to mlearning. For example, the misconception that mlearning is learning while mobile, represents a view of the portability of mobile devices and the notion of learning anytime and anywhere even while in motion. Another misconception is that mlearning refers to learning using mobile phones, correctly understanding the

term mlearning as shorthand for mobile learning. However, linking the term *mobile* with *phones* only, incorrectly advances the mobile phone as the only mobile device that can be used for learning (Brown & Mbat, 2015). It eliminates the possibility of linking mlearning with using a laptop, a tablet or software application.

Crompton, Muilenburg and Berge (2013) define mlearning as “learning across multiple contexts, through social and content interactions, using personal electronic devices” (Crompton, 2013, p. 4). The term *context* includes mlearning that is formal or informal, occurring in single or multiple settings, which can be directed by essentially anyone or everyone. Mlearning is taking place when someone accesses information from a mobile device to answer a question, or uses a mobile device to browse and satisfy a curiosity, or purposely uses a device to search and find relevant information, or listens to a mobile device for assistance when lost. So, the environment may or may not be a participant in the mlearning experience (Crompton, 2013, p. 4). In fact, definitions of mlearning tend to exist within silos of specialties making it harder for colleagues outside of those specialties to agree. Researchers may need a collaborative effort to bridge theoretical and epistemological divides. While it may be true that researchers cannot proceed with effective, meaningful research without clarity definitions and theoretical frameworks, this standardization does not appear likely any time soon.

### **Developing Theoretical Frameworks**

Mobile devices and technologies are accessible and permeate every area of the personal and public square in modern societies (Traxler, 2007). Even in emergent societies they are everywhere. According to Makoe’s (2012) research, over the last ten years cell phone users in Africa have increased 65% annually. Additionally, more than 90 percent of the population of students attending the University of South Africa, “own or have access to a cell phone that can be used in education for collaboration, tutoring, research, reading and writing purposes” (Makoe, 2012, para. 2).

While the explosion in mlearning possibilities appears to be limitless, our theoretical frameworks for understanding how it works or what really works, lag far, far behind. In fact, a quick search of mlearning literature reveals that most of the literature about theoretical frameworks is being proposed by scholars disturbed by lack of attention to the pedagogical aspects of mlearning. Park (2011) writes that “to support mobile learning environments, the development of comprehensive theoretical foundations is needed to position educational applications in a logical framework” (“Limitations and Considerations, para. 7). Mlearning requires an environment-independent and a time-independent pedagogy (Laouris & Eteokleous, 2009).

Emerging frameworks for mobile pedagogy are informed by several theoretical perspectives (see Table 1). With mobile technology and mobile instruments, the locus of control shifts from educators as the owners of knowledge, to the learners as knowledge seekers and creators. This shift in the balance of power can influence future educational content and methodology, as learners’ active engagement changes the curriculum and how it is delivered (Kukulsaka-Hulme, 2013).

Table 1 Selected theoretical frameworks in Mlearning

<i>Framework</i>	<i>Elements</i>	<i>Primary Considerations</i>	<i>Author</i>
3Ts (Text, tools, and talks)	Position pedagogy at the center of discussions about technology in classrooms.	<ul style="list-style-type: none"> <li>• minimizing the pivotal value of effective teaching</li> <li>• political agendas that attempt to control and regiment the work of teachers</li> </ul>	Phillip, T. M., & Garcia, A. D. (2013)
Social Constructivism	Course design should be socially based. Proposed a pedagogy that encompasses elements of theory, content, cognitive processes and evaluations	<ul style="list-style-type: none"> <li>• a learning management system-less (LMS less) approach that pushes technology to the background</li> </ul>	Cook, E. (2015)
CIE (curiosity, interest and engagement)	Consideration of personal, situational and contextual factors as variables	<ul style="list-style-type: none"> <li>• collaborative curiosity</li> <li>• informal learning environments</li> <li>• can complement formal learning environments</li> <li>• caution that curiosity doesn't automatically progress to desired outcome of learning mastery</li> </ul>	Arnone, M. P., Small, R.V., Chauncey, S. A., & McKenna, H.P. (2011).
Combination of Activity theory & Transactional distance theory	Theory devised to add new dimension to reflect characteristics of mobile technologies that include both individual and social aspects of learning	<ul style="list-style-type: none"> <li>• a classification scheme based on transactional distance and individualized versus socialized learning</li> <li>• help instructional designers improve mlearning instruction and implementation</li> </ul>	
Vygotskian socio-cultural perspective	Foregrounds pedagogy rather than technology; a perspective in which the pedagogy is central and the technology is under investigation only for what may be distinctive about the learning afforded by that technology	<ul style="list-style-type: none"> <li>• critique pedagogy in selection of mlearning scenarios</li> <li>• enable assessments of mobile activities and pedagogical approaches</li> <li>• consider contributions to learning from a socio-cultural perspective</li> </ul>	Kearney, M., Schuck, S., Burden, K. & Aubusson, P. (2012).

One of the frameworks currently under discussion is termed 3Ts (text, tools, and talk). It aims to position pedagogy at the center of discussions about technology in classrooms (Phillip & Garcia, 2013). According to its authors, discussions about the text, tools, and talk concepts helps in directing focus on the role of the teacher and how teaching and learning relates to students' interests and the technology used delivery of education. The 3Ts concept is a construct where researchers, policy makers, and funders can both appreciate the complexity of teaching with technology and have an appropriate dialogue to further the development of sound pedagogy (Phillip & Garcia, 2013).

Another framework draws on a social constructivism theoretical framework. Cook (2015) suggests that course design should be socially based and has proposed a pedagogy that encompasses elements of theory, content, cognitive processes and evaluations. She writes that the strength of this pedagogy is that learning can be tailored to particular disciplines. Micro blogging, small increments of learning, and the flipped approach to learning are considered positive developments that are made possible because of the ease of use of mobile devices, like the smart phone.

A third framework is called curiosity, interest, and engagement (CIE) framework (Arnone, Small, Chauncey & McKenna, 2011). This framework takes into consideration personal, situational and contextual factors as variables. The authors state that mobile technology can "invoke a collaborative curiosity which may reinforce individual curiosity and potentially contribute to sustained interest and engagement at both the group and individual level" (p. 184). According to them, mobile technology can complement formal learning by creating a cultural environment that is respectful of informal learning norms and practices. Informal learning environments created away from formal learning spaces can inspire and sustain interest significant engagement. On the other hand, it has been noted that in certain circumstances, curiosity is the prime factor in sustaining interest and engaging in deep knowledge creation can also act as a distracter (Carr, 2010). Rather than rely on curiosity to carry the load, the authors recommend that one needs to approach this with some caution and research the environment, students and circumstances of the course before assuming it will work.

Combining elements of activity theory (Kang & Gyorke, 2008) to modify transactional distance theory (Moore, 2007) to create a pedagogical framework, Park (2011) has taken a fourth approach. She writes that by modifying transactional distance theory she can adopt it as relevant theoretical framework for mlearning. Furthermore, Park classified previous studies into a group of four types of mobile learning: either high or low in transactional distance and either individualized or socialized activity. One of the results of her work is a classification scheme that helps those charged with designing and implementing mlearning instruction to be more effective.

From a Vygotskian socio-cultural perspective, (Kearney, Schuck, Burden & Aubusson, 2012), proposes yet another framework. It offers an examination of mlearning which "foregrounds pedagogy rather than technology; a perspective in which the pedagogy is central and the technology is under investigation only for what may be distinctive about the learning afforded by that technology." The authors propose a concept of "time and space along with personalization, authenticity and collaboration" that comprise the three distinctive features which forms this framework. Personalization is how the learner accesses and formats information to make it have value in a particular context. Authenticity speaks to the learner's sense that involvement with the mobile device constitutes a real or legitimate experience. Collaboration involves the learner making "rich connections" with others and other resources.

## Conclusion

Suggesting a transformation in the whole educational landscape, Oller (2012) advises educators, instructional designers, higher education and particularly teachers to “innovate, experiment, and be prepared to fail” (“What it means to higher education, para. 3). Oller (2012) further warns, that the future of mobile learning is not clear but mlearning will be disruptive and a game changer. He advances the notion of being well prepared by offering a set of questions that educators and higher institutions of learning should ask themselves in order to be well-informed and able to react appropriately to the influences that mobile learning will have on education.

In the brain research arena, Caine and Caine (1997), from John Hopkins University, offer parallel views to Oller (2012) and his vision of disruption in education. Caine and Caine (1997) advise educators that during the paradigm shift in schooling to the as-yet-unknown model, there may be chaos and confusion, but also opportunities and possibilities. They believe that the current educational common belief that goes something like, “experts create knowledge, teachers deliver knowledge in the form of information, and children are graded on how much of the information they have stored” (para. 5-7), is being challenged because of mobile technology and will be disrupted if society is to move forward. Furthermore, evolving knowledge about the interconnectedness of the brain and the way the brain makes meaning introduces the concept of *dynamic knowledge*; defined by Caine and Caine as the sort of knowledge that is “naturally and spontaneously invoked in authentic interactions in the real world” (para. 9). They conclude that when living in a mobile interconnected world, educators will have to learn how to enable the making of dynamic knowledge.

Ten years after the concept of *digital native* (Prensky, 2001) was popularized, Koutropoulos (2011) declared that is now clear, technology cannot make learners want to learn. Furthermore, inventing terms that only serve to classify learners based on their ability to access a particular technology does more harm than good. By revisiting the digital native discussions, Koutropoulos (2011) submits that there is no evidence that digital natives have become masters of their own destiny because they were born with technology. Koutropoulos (2011) further suggests that the current need in education is to return to pedagogy, expose students to information analysis type skills, and challenge students to find alternate methods of solving problems by learning how to modify learning strategies when things go wrong.

Dillard (2012) encourages educators to “re-envision” education and redefine the relationship between instructor and learner. He believes that there are ample learning theories available that can help develop a cogent set of instructional design principles that can be applied to mobile learning.

Overall, it appears the desire in society to use mobile technology in learning has created the current environment that will force the development of mobile learning theories and pedagogical frameworks.

## References

- Arnone, M. P., Small, R.V., Chauncey, S. A., & McKenna, H.P. (2011). Curiosity, interest and engagement in technology-pervasive learning environments: A new research agenda. *Educational Technology Research & Development*, 59(2), 181–198. doi:10. 1007/1142301191909
- Bass, R.V. & Good, J.W. (2004). Educare and educere: is balance possible in the educational system? *The Educational Forum*, 68(2), 161-168.

- Brown, T. H. & Mbatia, L. S. (2015, April). Mobile learning: Moving past the myths and embracing the opportunities. *International Review of Research in Open and Distributed Learning*, 16(2).
- Caine, R. N. & Caine, G. (1997). Understanding why education must change, *New Horizons for Learning*, John Hopkins School of Education. Retrieved from <http://education.jhu.edu/PD/newhorizons/Transforming%20Education/Articles/Understanding%20Why%20Education%20Must%20Change/>
- Cook, E. (2015). The future of mLearning begins with a baseline pedagogy, *Internet Learning*, 4(2). Retrieved from <http://digitalcommons.apus.edu/internetlearning/vol4/iss2/3>
- Cochrane, T. D. (2014). Critical success factors for transforming pedagogy with mobile web 2.0. *British Journal of Educational Technology*, 45(1), 65-82. doi: 10.1111/14678535201201384
- Crompton, H. (2013). A historical overview of m-learning. In Z. Berge and L. Muilenburg (Eds.) *Handbook of Mobile Learning*, (pp.: 3-14). New York: Routledge.
- Dillard, A. (2012). Mobile instructional design principles for adult learners. Capstone Report. Retrieved from the Applied Information Management Graduate School of the University of Oregon, <https://scholarsbank.uoregon.edu/xmlui/bitstream/handle/1794/12253/Dillard2012.pdf?sequence=1>
- Kang, H., & Gyorke, A.S. (2008). Rethinking distance learning activities: a comparison of transactional distance theory and activity theory. *Open Learning*, 23(3), 203-214.
- Kearney, M., Schuck, S., Burden, K. & Aubusson, P. (2012). Viewing mobile learning from a pedagogical perspective, *Research in Learning Technology*, 20(1). Retrieved from <http://www.researchinlearningtechnology.net/index.php/rlt/article/view/14406>
- Koutropoulos, A. (2011, December). Digital natives: Ten years later, *MERLOT Journal of Online Learning and Teaching*, 7(4).
- Kukulsaka-Hulme, A. (2013, Spring). Limelight on mobile learning. *Harvard International Review* 34(4). Retrieved from <http://hir.harvard.edu/the-future-of-democracylimelight-on-mobile-learning/>
- Laouris, Y., & Eteokleous, N. (2009). We need an educationally relevant definition of mobile learning, Cyprus Neuroscience & Technology Institute. Retrieved from <http://www.mlearn.org.za/CD/papers/Laouris%20&%20Eteokleous.pdf>
- Makoe, M. E. (2012, September). Chapter 3. Bridging the distance: The pedagogy of mobile learning in supporting distance learners. In P.B. Muyinda (Ed.), *Distance education*. DOI: 10.5772/48079
- Moore, M. G. (2007). The theory of transactional distance. In M. G. Moore (Ed.), *Handbook of distance education* (pp. 89-105). Mahwah, NJ: Lawrence Erlbaum Associates.
- Moore, M. G. & Kearsley, G. (2012). *Distance education: A systems view of online learning*. (3rd ed.). Belmont, CA: Wadsworth Cengage Learning.
- Oller, R. (2012, May). The future of mobile learning, *ECAR Research Bulletin*. Louisville, CO: EDUCAUSE Center for Analysis and Research, Retrieved from <https://net.educause.edu/ir/library/pdf/ERB1204.pdf>
- Park, Y. (2011, February). A pedagogical framework for mobile learning: Categorizing educational applications of mobile technologies into four types. *The International Review of Research in Open and Distributed Learning*, 12(2). Retrieved from <http://www.irrodl.org/index.php/irrodl/article/view/791/1699>
- Phillip, T. M., & Garcia, A. D. (2013). The importance of still teaching the i-generation: New technologies and the centrality of pedagogy, *Harvard Educational Review*, 83(2).

- Prensky, M. (2001, October). Digital natives, digital immigrants. *On the Horizon*, 9(5), 1-6. DOI: [10.1108/10748120110424816](https://doi.org/10.1108/10748120110424816)
- Prieto, J. C. S., Migueláñez, S. O. & García-Peñalvo, F. J. (2014). Understanding mobile learning: Devices, pedagogical implications and research lines. *Teoría de la Educación. Educación y Cultura en la Sociedad de la Información*, (TESI), 15(1), 20-42. Retrieved from <http://www.redalyc.org/pdf/2010/201030471003.pdf>
- Traxler, J. (2007, June). Defining, discussing, and evaluating mobile learning: The moving finger writes and having writ... . *International Review of Research in Open and Distance Learning*, 8(2). Retrieved from <http://www.irrodl.org/index.php/irrodl/article/view/346/882>