Mobile learning and Activity Theory

Maria Antonietta Impedovo

Università degli Studi di Macerata
aimpedovo@gmail.com

Keywords: Mobile learning, Activity Theory, Agency

The aim of this article is to interpret mobile learning within the theoretical framework of the Activity Theory. In light of the contributions in the literature, we highlight some key concepts of mobile learning. In particular, the focus is centered on the theme of agency.

for citations:
Impedovo M. A. (2011), *Mobile learning and Activity Theory,* Journal of e-Learning and Knowledge Society, English Edition, v.7, n.2, 103-109. ISSN: 1826-6223, e-ISSN:1971-8829

1 Introduction

Mobile learning is a particularly rich and fascinating topic, extensively explored by a long series of studies (Sharples, 2006).With this contribution we want to talk about mobile learning within the theoretical perspective of the Activity Theory. This model is particularly useful because it allows us to consider different characteristics of mobile learning. In particular, this paper will consider the question: what is the contribution of the Activity Theory as a theoretical framework of mobile learning?

2 Towards a definition of mobile learning

Defining mobile learning is not easy, considering that some definitions have focused more on mobile devices used, while others emphasize features such as the possibility of ubiquitous learning (Pieri & Diamantini, 2009).

Certainly, the advent of widespread mobile devices has contributed decisively to the emerging of mobile learning as a new expression of learning. In particular, mobile phones and portable instruments are now shaped according to user needs and cross the boundaries of formal and informal. However, as pointed out by Keegan (2005), the focus is on the mobility of mobile learning, not only related to the tools, but also more properly understood as user mobility. This reflection is incorporated into the definition proposed by Tylor (2006) who assumes that the concept of mobility as learning mediated by mobile devices; with the mobility of the subject and the mobility of content and resources.

3 Towards a theoretical model of mobile learning

Several attempts have been made to conceptualize and reflect on mobile learning within an appropriate theoretical framework. The analysis made by Traxler (2009) shows three different ways to search for and make possible a theory suited to mobile learning:

- import traditional theories from learning;
- develop a theory of local interest;
- subscribe to some more general and abstract theories.

Each of these options also presents the corresponding difficulty: in the first case, there is the problem of transferability of the theory, in the second option there is the question of validity, and in the third case the difficulty is the specificity and adaptability. Later we will consider the third option outlined: to be precise, we are going to explore the contribution of the Activity Theory (Engeström, 1987) to the reflection on mobile learning.

3.1 Activity Theory

The origin of the model is attributable to the founding of the "School of Russian Cultural History," developed in Russia with Vygotsky (1978) and Leont'ev (1981) in the early twentieth century. The key point of the Activity Theory is the concept of mediation: human activity is always mediated from the artifact and never direct in its relationship with reality (Ligorio, 2010). The concept of mediation was particularly developed by Engeström in 1987 within the text "Learning by Expanding: An Activity-Theoretical Approach to Developmental Research."

This theoretical framework is widely recognized internationally and is extensively applied, in connection with the theme of mobile learning. Subsequently, we will present some conceptual issues in literature between Activity Theory and mobile learning.

3.2 Artifact

The concept of the artifact has a long literature. It is mainly performed by Vygotsky (1978) as «instrument» materials that people use to carry out their activities and according to Engeström (1987) are crystallized tasks.

Artifacts are, of course, all cell phones and laptops that guarantee us the possibility of using textual and multimedia content: according to the tripartite division proposed by Wartofsky (1979), these artifacts are due to primary artifacts, those directly used in production. We can trace the secondary artifacts, which instead contain representations of primary artifacts, enabling the primary function of the artifact. The third level is a class of artifacts that can arrive at constituting independent dimensions, which Wartofsky calls "imagined worlds": even the artifacts related to mobile learning can feed back on users by developing and making possible activities that amplify the capacity of the individual and the community.

The concept of artifact is taken from an article by Sharples and others (2005), where in line with the Activity Theory, they consider learning in its historical dimension - cultural, mediated by artifacts that make possible the achievement of objectives and the development of skills. Specifically, Sharples et al., outline two levels of activity mediated by artifacts (2005):

- the semiotic level describes learning as a semiotic system where the action of the subject to achieve the target is mediated by cultural artifacts;
- the technological level is closely related to the technology that makes it possible. In this case, mobile agents are seen as crucial to the learning process in action.

According to the authors, the distinction between the two levels of analysis can be useful in giving the plan a semiotic theoretical framework and proposing an adaptation of the technological system of mobile learning. However, both layers can be stacked in order to allow a holistic view of the most complete learning system.

With this analysis the authors propose an integrated theory of mobile learning, oriented to a deep learning and co-evolution of technology, starting from the concept of mediation offered by the artifacts.

3. 3 Background

Discussing mobile learning can have many facets in enhancing learning. One point of view might also be the study of the environments and interfaces useful to get the most from this type of learning. Uden (2007) focuses attention on the importance of having an operational understanding of the environment to develop user interfaces and flexible benefits. Starting from this premise, the author proposes the Activity Theory as a useful model for this type of analysis. In fact, the system components integrated in a social and cultural, motivational and intentional prospective make it possible to design a high-quality and personalized environment to take full advantage of mobile learning for the user.

The article by Hayes *et al.* (2005) suggests, however, the theme of the context understood in the cultural and historical perspective of the Activity Theory as useful for recovering the social dimension of the individual user with its network of reference. Both analyses, although different, suggest the need to emphasize the socio-cultural context as central to improving mobile learning.

3.4 Agency

A key point in this theoretical corpus of the Activity Theory, and may offer insights for mobile learning is the agency. This concept was created to indicate the ability of people to act as agents, or rather to react in a transformative way in their environment. Introduced by the social cognitive theory, it is a contruction closely linked to self efficacy: "Among the mechanism of human agency is more central or pervasive ninth than beliefs of personal efficacy (Bandura, 2002, p.270). In the Activity Theory the human agency is linked to the relationship between the subject and the tools it uses to achieve its objectives.

Considering that by its very nature, mobile learning has a social - constructivist personality (Hayes *et al.*, 2007), mobile learning enables active forms of agency and allowing the student to be in a central position in the learning process. This subject is a significant link with mobile learning if associated to the autonomous production of multimedia content by individuals or the

autonomy to use their tool to access the Internet, leading to innovative forms of communication.

Promote mobile learning allows the agency to be in line with the needs of a society in constant transformation, where the ability to act and intervene creatively in reality becomes dominant. Indeed, the challenge of education for a global networked society also passes by and developing individual skills that can autonomously acquire through technological means.

The concept of agency communicates with mobile learning and could be useful for a renewed debate about the link between theoretical learning and mobile learning. The mobile nature of learning allows the individual to be a creator of contexts and educational opportunities and independent learning, by customizing learning paths. Therefore, the evolution of technology, which made possible the development of mobile learning, actively building new worlds of learning (Rossi, 2009).

Conclusions

A key point in this theoretical corpus of the Activity Theory, and may offer insights for mobile learning is the agency. This concept was created to indicate the ability of people to act as agents, or rather to react in a transformative way in their environment. Introduced by the social cognitive theory, it is a contruction closely linked to self efficacy: "Among the mechanism of human agency is more central or pervasive ninth than beliefs of personal efficacy (Bandura, 2002, p.270). In the Activity Theory the human agency is linked to the relationship between the subject and the tools it uses to achieve its objectives.

Considering that by its very nature, mobile learning has a social - constructivist personality (Hayes *et al.*, 2007), mobile learning enables active forms of agency and allowing the student to be in a central position in the learning process. This subject is a significant link with mobile learning if associated to the autonomous production of multimedia content by individuals or the autonomy to use their tool to access the Internet, leading to innovative forms of communication.

Promote mobile learning allows the agency to be in line with the needs of a society in constant transformation, where the ability to act and intervene creatively in reality becomes dominant. Indeed, the challenge of education for a global networked society also passes by and developing individual skills that can autonomously acquire through technological means.

The concept of agency communicates with mobile learning and could be useful for a renewed debate about the link between theoretical learning and mobile learning. The mobile nature of learning allows the individual to be a creator of contexts and educational opportunities and independent learning, by

customizing learning paths. Therefore, the evolution of technology, which made possible the development of mobile learning, actively building new worlds of learning (Rossi, 2009).

REFERNCES

Bandura, A. (2002), *Growing primacy of human agency in adaptation and change in the electronic era*, European Psychologist, 7, 1-16.

Cole, M. (1988), *Cross-cultural research in the sociohistorical tradition*, Human Development, vol. 31(3), pp. 137-151.

Engeström, Y. (1987), *Expansive Learning at Work: toward an activity theoretical conceptualization*, Journal of Education and Work, Vol. 14, No. 1, p. 133- 156.

Engeström, Y. (2009), *The Future of Activity Theory: A Rough Draft*, in: Sannino A., Daniels H., Gutierrez K. D. (eds.), Learning and Expanding with Activity Theory. 303- 328, Cambridge, University Press.

Hayes, P., Pathak, et al. (2005), *Cultural-Context of Mobile Learning using Activity Theory*, Proc. Of the 6th Annual Irish Educational Technology Users' Conference.

Keegan, D. (2005), *The Incorporation of Mobile Learning into Mainstream Education and Training*, Proceedings of mLearn2005- 4th World Conference on mLearning, Cape Town, South Africa, 25-28 October 2005.

Leont'ev, A. N. (1981), *Problems of the Development of the Mind*, Moscow, Progress.

Ligorio, M. B., Pentecorvo, C. (2010), *La scuola come contesto*, Bari, Carocci.

Pieri, M., Diamantini, D. (2009), *Il mobile learning*, Guerini e Associati.

Rossi, PG. (2009), *Tecnologie e costruzione di mondi*, Roma, Armando Editore.

Sharples, M. (Ed.) (2006), *Big Issues in Mobile Learning: Report of a workshop by the Kaleidoscope Network of Excellence Mobile Learning Initiative*, University of Nottingham, LSRI.

Sharples, M., Taylor, J., & Vavoula, G. (2005), *Towards a Theory of Mobile Learning*, in: van der Merwe H, Brown T, Mobile Technology: The Future of Learning in Your Hands, mLearn 2005 Book of Abstracts, 4th World Conference on mLearning, Cape Town, 25-28 October 2005, Cape Town: mLearn 2005, p. 58.

Taylor, J. (2006), *What are appropriate methods for evaluating learning in mobile environments? Evaluating Mobile Learning*, In: M. Sharples, (Ed) Big Issues in Mobile Learning, Nottingham, Kaleidoscope Network of Excellence, Mobile Learning Initiative.

Traxler, J. (2009), *Learning in a Mobile Age*, International Journal of Mobile and Blended learning.

Uden, L. (2007), *Activity theory for designing mobile learning*, International Journal of Mobile Learning and Organisation archive, 1 (1).

Vygotskij, L. S. (1978), *Mind in Society: the development higher psychological*

processes, Cambridge, Harvard University Press.
Wartofsky, M. (1979), *Models: Representation and the scientific understanding*, Dordrecht, Riedel.