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Olivier Marty

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Learning experience on a touchpad
Qualities required for mobile learning

Olivier Marty
Education scientist, post-doctoral researcher at Cnam (France)
Olivier.Marty@cnam.fr

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Mobile learning – distance education – adult learning – higher education – education ethnography

Abstract

This document describes a mobile learning experience on touchpad, using both open educational resources (OER) and massive online open courses (MOOC). It shows the different learning qualities required, including the ones necessary for distance education: autonomy, self-organization, flexibility, etc.

Our thesis is threefold: mobile learning relies on distance learning (chapter 1); it involves all cognitive qualities of Bloom's taxonomy and specially the highest ones (chapter 2); it is a social learning that can be described with ethnography methods and that requires digital social qualities (chapter 3).

Introduction to a research question

Mobile learning is an educative priority in the world, as it appears on the Unesco website (http://www.unesco.org/new/en/unesco/themes/icts/m4ed/mobile-learning-resources/unescomobilelearningseries/). Modern mobile learning implies technicalities such as diffusion of touchpads and laptops, Internet connection and electricity. These conditions are reached in Europe and it is therefore a reality supporting lifelong learning policies.

However, what does it mean to learn on a touchpad? What are the qualities necessary to mobile learners? Answering this research question will help us to determine the good practices and whether it is important or not to set a specific education policy to mobile learning.

Method and literature

This document belongs to learning sciences applied to mobility, it uses mostly participatory observation as part of anthropology for contemporaneous worlds (Augé, 1999). I am a former distant learner on traditional paper distance education: I gained two simultaneous European degrees in philosophy (2000) and sociology (2001) with the distant education service of the University of Toulouse. As a post-doctoral researcher in education sciences, doing an ethnography fieldwork in a

French distance education institution, I try and study mobile innovative devices. I publish and read daily open educational resources with mobile tools (laptop, touchpad) and I recently gained statement of accomplishment on a Coursera Course in partnership with Stanford University (2014). My online ethnography fields of enquiry are therefore Learning Management Systems, Mooc's forum and Facebook pages where groups of students interact to learn together. An example of this ethnographical work can be found on my research page http://educations.voila.net, in the document "Learning on an online campus" (http://halshs.archives-ouvertes.fr/docs/00/92/34/72/PDF/marty_LMS.pdf). The same ethnographical method will be used here to answer a specific research question: what are the qualities and good practices for mobile learning in higher education?

The epistemic framework of this document is therefore anthropologic. I will build on previous fundamental researches (Marty, 2002, 2003, 2004) to focus on the field of education and learning, with the perspectives of Moore for distance education (Moore, 2012), Bloom for its taxonomy of cognitive abilities (Bloom, 1994) and Bandura for social learning (Bandura, 1977). I therefore defend a large view on anthropology of learning, including both social sciences and psychology (Sawyer, 2006; Anderson, 2004; Henri, 2001) – i.e. social interactions within groups embedded in an environment as well as processes and cognitive functions inside individuals.

Document's structure

The document is divided into three chapters: I will first show how mobile learning supposes distance education and its specific qualities and good practices. Then, how Bloom's taxonomy can be applied to a mobile learning activity (such as attending a Mooc on a touchpad) – mobilizing all levels of learning cognitive abilities. Last, I will explore social learning and the collective dimension of mobile learning. The qualities and good practices I will develop all along these three chapters can be summed up around the notions of autonomy, self-organization and flexibility.

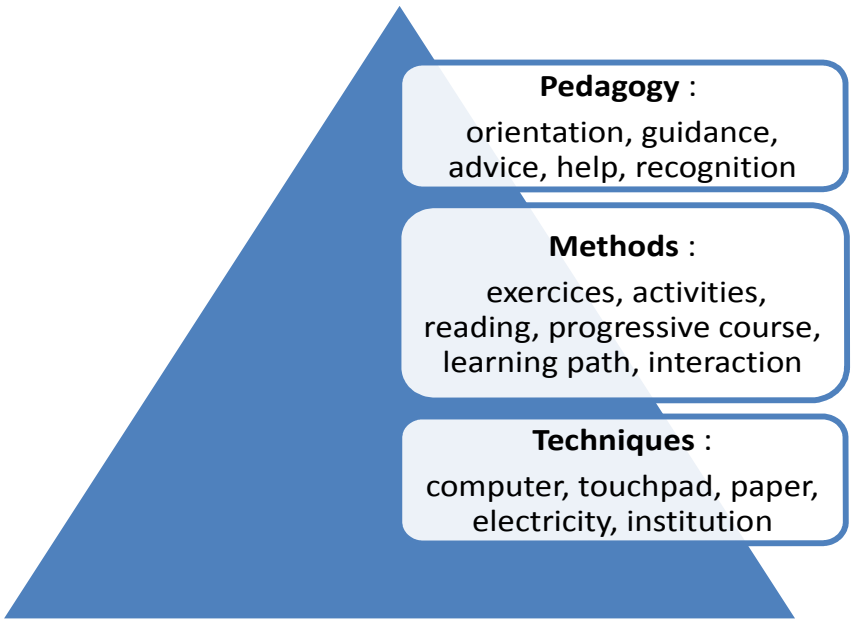
Chapter 1: from distance education to mobile learning

The model of didactical hierarchy

Mobile learning can be analyzed as a subset of distance learning. Mobile learning would be a form of distance learning where the distance between the learner and the teacher is variable. Considerations about social distance to other learners or psychic distance to learning materials may be disputable but we can take for granted that the learner is mobile and therefore his or her physical distance to the teacher changes all the time.

As a consequence, all the scientific work about distance education and learning specificities is applicable to mobile learning. It can be the effects of the media interposed between the learners and knowledge (this is the research object of the scientific review *Distances and mediations of knowledge*) or even Moore's theory on transactional distance (Moore, 2012, translation: Marty, 2011). This transactional distance is a framework for analysis combining the two dimensions of structure and dialog in order to locate all distance education trainings. On the axe of structure the analyzer can define the nature of contents and of the learning paths (methods) delivered. On the axe of dialog the analyzer can fix the degree of interactivity and communication between the learner and teacher (pedagogy). Crossing these two axes defines a two-dimension space where to locate any distance education training – and therefore any mobile training. The importance of the autonomy of the learner is also a quality that is transferable from distance to mobile learning.

However, I defend that mobile learning is more depend on technicalities than distance education is. As a matter of fact, the connection to Internet on a moving bus, the quality of image and sound for a long study in an airport waiting room or on a railway platform are very important if the learner is to have productive experience of his/her learning time. Consequently, instead of a two dimension space where to locate distant training, I propose a pyramidal shape based on techniques (laptop, touchpad, Internet connection, institution delivering the learning content…) developed by methods (courses contents and structure, learning paths and their activities : reading, listening, online exercise,…) and topped by pedagogy (dialog with a teacher for orientation, guidance, advice, help, recognition…). This three layers structure constitutes a didactical hierarchy within mobile learning.



Didactical hierarchy

Out of the theoretical framework of transactional distance emerges a new model for mobile learning. I will now describe the qualities necessary to mobile learners within this model of didactical hierarchy.

The qualities of mobile learners according to the didactical hierarchy model

In this new model, the base is constituted by technical considerations – i.e. the state of the art. A good practice in mobile learning will therefore be to use adapted technical devices: to be equipped with tools such as touchpads or laptops in tune with the bulk of institutions delivering online contents – amateurs of long tutorials are late, fans of video games on virtual reality glasses are in advance in comparison with the mobile learning offer of most of distance education institutions. To be connected to the Internet and be able to plan one's learning according to this connectivity is a major quality: it is impossible to browse on a Mooc in a subway or a plane, but it is possible to go through the reading list if prerecorded on one's touchpad or mobile phone.

The intermediate level is the one of methods – the learning paths. An important quality for mobile learners is autonomy: to be self-organized in order to find a pace of consultation of readings, audio materials, exercises… The notion of progression is important: to be able to process one step after the other, to start at the proper level (neither too advanced nor too basic) and to be conscious of one's learning objectives in order to be motivated and efficient. In the realm of method, the mobile learner is challenged since he has to disconnect from reality (a noisy railway hall) to be connected to the content he is learning (on his screen). This concentration is more important than in the case of traditional distance education where the learner is comfortably installed in his home office.

The highest level of the didactical hierarchy model is the one of pedagogy – the closest notion to education since it is about guidance and conduct. At this level, the mobile learner should be able to be self-directed to seek and listen to a distant pedagogue : he or she will look for orientation and advice, help in case of difficulty and recognition to be sure that he/she has done the learning properly. A quality of discipline and humility is important, the ability to become a disciple of someone who knows. In the case of mobile learning, it feels sometimes strange to disconnect from reality (for example an amphitheater with a teacher delivering a course) to look for an online connection with another pedagogue. Such liberalities offered by mobile learning could be moderated by the quality of perseverance (a long-term engagement with a pedagogue) necessary for a deeper learning.

With the huge offer of online trainings (including techniques, methods and pedagogy), the mobile learner could be trained to choose properly his/her learning, that is to say to measure the value of what he or she wants to learn. Is it the proper format (technique available at that time, methods adapted to his or her learning style, proper pedagogue)? Is it the right moment to invest time in a

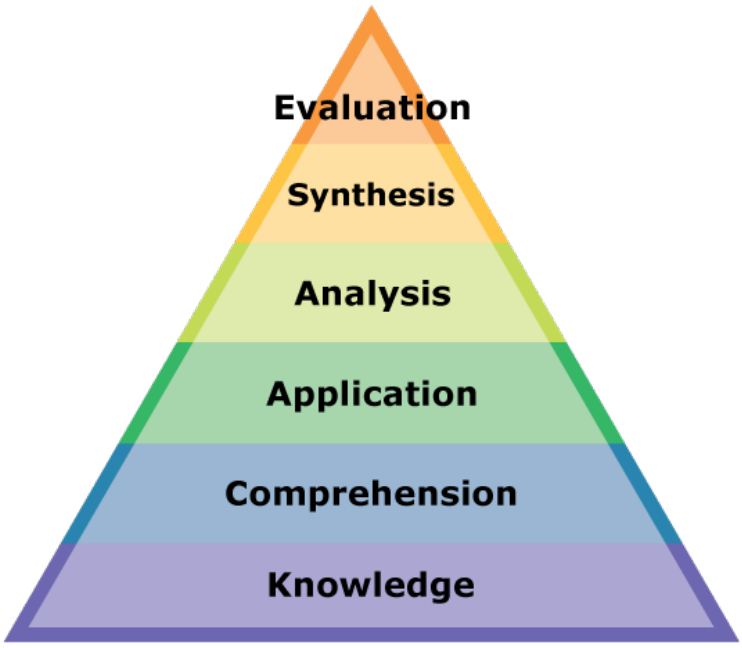
training? Will the learning pay off immediately or after many years? To sum up, this quality of awareness to a training value necessitates mastering the didactical hierarchy.

After this first analysis based on an evolution from distance education to mobile learning we will now use Bloom's taxonomy. Henceforth, we will think about the cognitive abilities necessary for a mobile learner.

Chapter 2: cognitive qualities in Bloom's taxonomy applied to mobile learning

Bloom's taxonomy…

The North American taxonomy elaborated by Bloom's research team (Bloom, 1956) and recently reorganized (Bloom, 1994) will be our framework to look at the cognitive realities of modern mobile learning. As presented in the model below, the different cognitive functions used when learning are piled up in a pyramidal shape.



Bloom's taxonomy (1956)

At the bottom of the pyramid are the fundamental functions of knowledge remembering, comprehension and application; then higher mental processes are involved when it comes to analyzing, synthesizing and evaluating. A modern version of this model changes slightly the top of the pyramid to place evaluation and finally creation as the two highest cognitive functions. We will use

the traditional model as presented in the figure to apply it to mobile learning, with a few considerations about the new version.

… applied to mobile learning…

What are the cognitive functions involved when learning on a Mooc with a touchpad? The fundamental activity is to acquire knowledge by reading course material (on a mobile bus, plane, or train) and watching videos (preferably at home for connection and audio quality reasons). Then one has to remember this knowledge to answer the quizzes (i.e. select the right answer identified in a multiple choices question), which implies short term memory (this activity is done weekly).

However, this cannot be done without a minimal comprehension or understanding of the course. This activity of interpretation can be done alone when reformulating the reading and videos or, more likely, through social interaction on the forums. On the forums, questions about the course can be asked to other participants or directly to the teacher. Reading other learner's discussions on the forum and exchanging points of views and summaries can help to understand better the course on a daily basis – or whenever it is needed.

The third level of application is a higher process that can also be triggered by daily activities: when one is learning on a course during lunch breaks, one is more likely to apply directly to his work environment than if he or she was in a formal training, cut from everyday life. This application or connection to practical issues is also encouraged by the weekly essays to submit. The mobile learner has to hand in an essay where he or she will use the theoretical lens to look at realities. Writing down this essay and then correcting the ones of his or her peers allows the learner to better perceive the relationship between the abstractions of the course and the concrete realities.

The very same weekly essay is also an opportunity to analyze what he/she has learnt. When correcting other learners by peer assessment, one is more aware of the different components of the course and their relative importance. He/she deconstructs the essays in elements to better analyze their arrangements. He/she is encouraged to compare the essays to contrast their different construction. The mobile learner gets into the deep logic and semantics of the essays he is correcting, which implies a cognitive ability of analyze.

The two highest functions of synthesis and evaluation, or evaluation and creation in the new taxonomy, are mostly used when choosing a Mooc, i.e. even before starting it. Indeed, when reading the different options offered to him/her, the mobile learner combines pieces of information in order to make a decision about which course to choose. This might be the most important moment in a Mooc: when one compiles data about courses technicalities (which support? institution?), methods (what contents? types of exercises) and pedagogy (who is the teacher?), one evaluates all its

dimensions in order to create the best learning time. The mobile learner has to be critical in order to assess and make a qualitative choice.

…implies specific qualities for mobile learners

To sum up, mobile learning implies all cognitive functions ranked in Bloom's taxonomy. Our description leads us to precise that fundamental functions, such as remembering knowledge and understanding what is learnt, may be used in lower proportions relatively to traditional learning. Indeed, essay's peer assessment implies a higher proportion of application and analyze and the abundance of trainings offered to the mobile learner at any time, in any space, demands him/her to be often synthetic and evaluative to take the better decisions.

In other words, the pyramid is inversed with mobile learning on Moocs: the highest cognitive functions are more used than the fundamental ones. The learning effort demands a development of the most elaborated capacities of the human brain. The learner is more often in a position of choice and evaluation; he is less likely to be a mere memorizer. Therefore, an education to mobile learning may be to develop these higher cognitive functions in order to prepare the learner to their future learning activities.

Mobile learning has its psychic specificities – a more common use of the highest cognitive functions. Does mobility requires social learning qualities?

Chapter 3: Online ethnography of mobile learners' qualities

Interactions on forums and wikis: participative qualities

The social learning (Bandura, 1977) qualities can be observed on traditional forums. It is during the electronic interactions that learners connect to the teachers for a better understanding of the course or to other distant learners to interpret the readings. The social information about the writers is generally poor: the forum merely indicates the status: "Teacher", "Technical Assistant" or the name of the learner and his/her picture (revealing grossly his/her sex, age, ethnics). Therefore the learner has to adapt his/her sociability to find the proper interactive mode with little information about the other ones. The information is written and therefore it is harder to decode an implicit meaning that could be given by an intonation or a facial expression. Most of the information is read on a forum thread (there is a title framing the discussion) that can be browsed, focusing only on a few comments. The main social learning quality in this case is based on interactions poorly framed: much liberty is given to the learner who has to complete all the missing pieces with his/her imagination.

A technical tool develops the forum instrument: the wiki. In certain MOOCs, the learners are asked to collaborate on specific topics. This collaborative work leads them to construct together a common sense on a theme. Online ethnomethodology allows us to watch the social construction of reality and the processes of collective sense making. The main quality required in this case is the ability to read and accept other's learners point of view and then to participate to a collective elaboration. Self-efficacy in this social learning is based on acceptance and contribution.

In these two online social learning realities, the forum and the wiki, we see that the physical instrument (a technique on a website) frames the social interactions (written messages, collaborative sense making) and finally the cognitive qualities for the learner to succeed (decoding the status, acceptance and contribution to the collectivity). It is the same concentric embeddedness that the one we observed in a previous ethnographic study (Marty, 2002 - http://www.ethnographiques.org/2002/Marty). We will now continue our ethnography in virtual learning environment with the analysis of audiovisual material.

Videos and virtual classrooms: cross-cultural qualities

The relatively poor social interactions based on writings in a forum or a wiki are very often completed by a visual dimension on modern distance education. Whereas most of the Open educative resources are textual document, the Massive online open courses propose videos to watch and sometimes virtual classes to talk about the course. Blended learning is possible: the mobile learner can arrange a meeting with Mooc mates in a bar of the city he/she currently is to talk about the course. But most of the time this kind of meetings happens online, for example during a Google Talk About session. What are the social learning qualities when using these modern tools?

A rapid adaptation to other learners is necessary: the online meeting lasts only half an hour and one has to quickly adapt to the six other learners he/she is to interact with. A massive course often gathers people from different continents, age, sex… and cultures. Some cultures are more respectful to older ones' knowledge, other are gender sensitive regarding access to knowledge and authority, time management and discussion openness is not always smooth, etc. A cultural plasticity and sensitiveness to these implicit data is therefore important for a strong cross-cultural learning experience. Adaptation to accents from different parts of the world is also central for this communication.

On the other hand, video devices (an online lecture or a virtual classroom meeting) facilitate the interpretation of messages by facial expressions and voice intonations (Marty, 2003). It is closer to a real social interaction and is adapted both to visual and auditive learning styles. In a statistical study, Evans (2008) has shown that the video helps for a better learner's retention of the course. We will

end up our online ethnographical description by a combination of texts and images on networks tools.

Learner's social networks and flexible sociability

The virtual learning environments include their own networks, or point out to a Facebook group. On these tools, the mobile learners, disconnected from any real world sociability, can find their online "learning buddies" independently from any geographical consideration. The group offers general pictures about the training and every learner can add a special profile picture to personalize his/her presence. The learner can communicate with someone else sharing the same course and identify himself / herself with the group thanks to this special link. The relationship not merely based on a topic to be discussed, like in the forum, but can be decided for "proximity" reasons: finding someone who is doing the same work, who belongs to the same professional or national culture, etc. Within this relationship of virtual proximity, it is easier to have distant comments about the course than if the two learners were to discuss in the forum on a topic determined by the teacher. A mobile learner is more likely to meet this social network friend in reality than a static distant learner.

This online sociability is very often brief: it is bounded by the course time. Therefore, the mobile learner has to quickly start this relationship, chat or exchange asynchronous messages during a few weeks, and will probably end it after the course. Adaptability and flexibility seems to be the main qualities concerning the social dimension of mobile learning. As Roderick (2008) pointed out: nomads must be connected and collaborative for a qualitative learning.

Conclusion

We described how mobile learning was an evolution of distant learning. We first analyzed the qualities of the mobile learners through the model of didactical hierarchy. Then we looked at cognitive functions mobilized, applying Bloom's taxonomy. Finally, ethnography of online learning interactions allowed us to describe social learning qualities. In order to master mobile learning, one should be able to follow distant learning, online learning and, finally to be mobile. Therefore, a policy for mobile learning cannot be limited to equipment: and education to the qualities we described would prepare the new generations to learn. Measuring the value of a training, using higher cognitive functions, having a numeric sociability… all these qualities could be developed as early as possible in order to fully take advantage the potentialities of mobile learning.

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