Mobile Learning Field Activity: Pedagogy of Simultaneity to Support Learning in the Open

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Abstract

Mobile learning field activities are presented in this paper as a mechanism for enacting learning in the 'open', either in response to formal disciplinary learning activities or to support those moored in informal learning practices. Field activity represents a disciplinary model found across the (field) sciences and throughout the humanities. It has traditionally involved using disciplinary process (observation, data collection, analysis, dissemination) to research social or biological phenomena. Mobile technology has accelerated the process and potential for "coming to know" in the field by allowing the learner to engage multiple layers of meaning, social presence, time, and place simultaneously. These mobile learning field activities represent an authentic application of both informal and formal learning, and include, by way of example, learning walks, geocaching, and urban exploration. Examples presented in this paper include a mobile learning field activity presented in Helsinki, Finland.

However, the context, content, and social interactions of this learning can be incredibly complex. This complexity requires a pedagogical response that acknowledges this complexity, identifies the layers of engagement and simultaneous activity taking place, and proposes strategies that maximizes the potential of learning in the open (or in the field). This paper identifies three continuums in which this simultaneous activity is taking place: the serendipity-intentionality of learner orientation, the informal-formal activity structure and the initiative-seduction-sense of intervals continuum of human presence. All three speak to the variety of learner engagements that occur as a result of mobile learning and field activity.

This paper advances the belief that new pedagogical approaches are needed to account and make use of these continuums of activity. These layers overlap and are simultaneously engaged in by the learner to generate context and understanding in fluid mobile spaces. The Pedagogy of Simultaneity is proposed to account for these layers of overlap and simultaneity. It advances a pedagogical response by emphasizing human methods. These methods are enacted through trust, discussion, and collage (or composition). Teachers can generate field activities that emphasize this layered reality for learning. This pedagogy addresses the complexity and simultaneity present in mobile learning field activities and we are cautiously optimistic that it also applicable to open learning and elearning.

Keywords

mobile learning, elearning, pedagogy, field activity, open learning

Introduction

The purpose of this paper is to present a type of mobile learning that engages the learner in field activities, which are defined for the purpose of this paper as activities designed to authentically enact the disciplinary learning or informal learning engagement. Field activities (and the associated concepts of fieldwork and field methods) are appropriated for this paper as a means of enacting a disciplinary or informal observation, data collection, analysis, and composition process through the medium of mobile technology. The field in question is the 'lived world' outside the classroom, which serves as both as the subject of inquiry and the learning context, a model complementary to existing practice in both the field sciences and the humanities. Mobile technology represents a technological tool in this larger process of coming to know in a disciplinary space (Saljo, 1999) by

providing capacity for performing data collection, analysis, and composition tasks, as well as providing capacity for media and metadata creation. Learners and teachers in these field activities are in a constant process of coming to know through the manipulation of tools and context. Mobile learning becomes a transformation of habitus, or the learner's mindset (Kress, Pachler, 2007) towards their discipline or field. The learning spaces enacted through these field activities are highly volatile, requiring a perpetual construction of context on the part of the learner and the teacher.

In this paper, simultaneity is defined in respect to the variety of learning activities, conscious or subconscious, being undertaken by the learner at any given moment. Simultaneity establishes that learners are perpetually cycling through different learning activities across different time, place and social combinations. Research charting simultaneous learning has been undertaken in linguistics (Warriner & Wyman, 2013), education (Brookshaw et al, 2012), and in psychology and physiology (Virsu et al, 2008). Mobile learning and field activity, when combined, represent a complex space of simultaneous activity. Learners are engaging their physical environments, their disciplinary subjects, their technological capacity, their media literacy and their social collaborations across time and space intervals. These are highly ephemeral constructions of context, volatile in their capacity for supporting many perspectives and combinations. This is is learning in the open and it can be chaotic. This paper advances the belief that the mobile learning in the field requires a pedagogy that embraces these simultaneous layers of time, place, and social presence and transforms them into learning layers of trust, discussion, and collage (Gallagher, Ihanainen, 2013).

Field activity generating mobile learning

For this paper, field activity refers to acts, performances and behavior in which people perceive, examine and make meaning for their current and future understanding in their natural environments (disciplinary activity and daily events of living and working). Fieldwork itself has a long and rich history in formalized learning, both as a methodology as well as an object of investigation (Gupta & Ferguson, 1997). It involves the application of theory to the natural field sciences or the lived world (humanities, anthropology, etc.).

These field activities can be inspired and guided by formal settings such as lessons at school, or they can relate to informal or practical learning opportunities, such as professional development, workplace activities, or personal learning activities. There are many instances of mobile technology supporting fieldwork and field activities (Haapala et al, 2007; Saaskilahti et al, 2010; Hwang et al, 2012; Colley, Gibbs, 2012, in their work on using mobile technology in informal learning, field science, and archaeology). Mobile learning enacted in these activities blurs the traditional fieldwork processes of observation and data collection in the field followed by analysis and composition at 'home' or in the classroom. Mobile technology allows for these processes to occur seamlessly and immediately. Learners can observe, collect, compose, and disseminate findings in the context of the activity itself.

In this space, the learner is constantly moving between states of informal and formal activity. It can be called everyday learning, which means that learning is present in all natural activities done at the workplace and at home, in hobbies and other leisure activities. Informal learning is not purposefully goal-oriented, but it can happen while working, which itself is targeted activity (building a summer cottage, for example). Informal learning activity is present in formal settings as well, e.g. during class breaks, extra-curricular activities, and through other informal emerging social settings. Informal learning is not the same as non-formal learning, which can be very formal, but is implemented outside the official educational system (Ihanainen, 2013). These mobile learning field activities can also refer to facilitated action in authentic work and job environments, i.e. construction worksites, nursing homes, daycare centers, media companies, etc., in which on-the-job learning, internships, practical training, and apprenticeships take place. Additionally, field activities can take place in the environments of learners' choosing, for instance in cities, suburbs, and rural areas. These field activities can later be interpreted, drawn together, assessed and produced as learning resources in workshops in between field activities.

The disciplinary, formal variety of these mobile learning field activities can take place in the humanities as well (Gallagher, 2013a). Field activity is already a core method of many of the sciences and social sciences (Gupta & Ferguson, 1997); these mobile learning field activities merely extend, or augment, that method further into these disciplines. They foreground media literacy (Marty et al, 2013), collective memory and representation (Jacucci et al, 2007), and collaborative in situ disciplinary learning (So et al, 2012). The example below outlines a workshop conducted in Helsinki (2013) as part of a professional development exercise and an informal support group (Otavan opisto, 2013). Formal classroom activity involved an introduction of mobile learning, and a

discussion around the methodology and associated activities of fieldwork. Participants were asked to identify several methods for the observation and data collection activities, which involved using mobile technology to record impressions of Helsinki through a disciplinary lens (architecture, sociology, theology, urban planning, history). Participants collected media through mobile technology, discussed the significance of that media for disciplinary understanding, and then assembled this media into compositions of mobile media that were presented to the other participants at the concluding session the next day. The activity challenged learners to re-examine their understanding of the accepted modes of disciplinary interaction, accepted forms of evidence to present that understanding (media), and accepted containers for that presentation (collages, montages, maps, as opposed to strictly textual essays). Compositions included interactive tram maps, videos, collages, and montages (Gallagher, 2013b: http://bit.ly/1g2jpII). Further instances of this field activity have been conducted by the authors in Seoul and Tallinn as part of a formal learning activity; and in London, New York, and Jyväskylä, Finland as part of the authors' informal learning investigations.

Further field activities might include learning walks (Robinson & Sebba, 2010) as a means of investigating a place informally, or evoking the ever-referenced concept of flanerie as a learning activity (McFarlane, 2010). These learning walks can be made more interactive through the incorporation of geocaches as a means of engaging the learner in the investigation and composition of place (Jones et al, 2012). Learners can embed geopositioned metadata into the compositions generated from these field activities, thereby providing a social and intellectual bridge to the next set of learners engaging in that activity in that place. These learners are essentially perpetuating their learning into the field for future discovery.

Compositions generated from this activity are diverse. They can include the traditional text-based essay or scientific dataset, as well as multimodal compositions. They can include collages, mosaics, montages, maps, and models, anything that reveals the meaning and relevance of the learner's understanding. Yet it is most important to foreground the idea that these compositions are never complete; in these activities, learners are "engaged in an iterative, evolutionary process aimed at the gradual improvement of a community's shared content" (Bruns, 2007). These compositions are active constructions of meaning in a shifting community; the learners are "discovering" meaning through the creation of their compositions (Gallagher, 2013a). This process is not unlike a writer not fully knowing the outcome of a story until they have written it; purpose can often emerge as one progresses through the composition. The focus on the field, on life and understanding in the open, further complicates and emboldens this effort: the learners change, the locations change, the research questions, social interactions, and disciplinary contexts will all change, each and every time the learner engages with the location. This complexity forces an examination of existing pedagogy to support such learning. In the following section, we present the salient characteristics of this kind of mobile learning as well as a pedagogy that encompasses them.

Characteristics of mobile learning for creating a pedagogical model

Mobile learning generated through field activity is highly contextual, which can be characterized by movement through the following ranges of activity. They are the first step to understand how mobile learning field activity can progress into an education called Pedagogy of Simultaneity (PoS). Learning in movement means at least three things, which are orientation, structure and human presence of learning. In the Pedagogy of Simultaneity they are the learning and pedagogical context.

- serendipity & intentionality continuum in terms of orientation
- informal & formal continuum in terms of structure
- initiative-seduction-sense of intervals continuum in terms of presence

Serendipity-Intentionality Continuum

Serendipity means that learning encounters are filled with possibility. Some of these encounters or possibilities become consciously visible, yet many if not most remain at the subconscious level to be revealed as a potential learning activity at a later date, if at all. A serendipitous learning orientation refers to a trust in the potential for serendipity to reveal itself and its learning potential, as well as an open mind for registering this serendipity.

Intentionality means that we as learners and teachers try to proceed within and execute purposeful encounters to learn, to benefit from and enjoy this learning and the people they include. This intentionality can be manifested through teaching or learning settings, professional meetings and all kinds of mutual and multilateral social encounters. An intentional orientation is a conscious and goal-oriented readiness to act to realize learning

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potential. The serendipitous & intentionality continuum points to an emergence of a learning orientation that moves back and forth between these states of serendipity and intentionality. This serendipity-intentionality orientation is a trust argument for PoS, and it is assumed for the purposes of this paper that learning, especially mobile learning field activity is a shifting process of learning by intention and learning by serendipity. Intentionality is codified in much of our activity-based pedagogy, such as experiential learning (Kolb, 1984), while serendipitous learning has been investigated extensively in elearning and mobile learning scenarios (Buchem, 2011; Vavoula, Sharples, 2002). Orienting the learner towards both sides of this continuum is valuable for maximizing the learning benefis of mobile learning field activities.

Informal-Formal Continuum

The informal and formal structures are presented as the artifacts of a learning context; these are combined into learning structure in an endless variety of forms. Informal structures are those everyday settings, activities, places, and people that are present in workplaces and at home, in hobbies and other leisure activities, that are not enacted purposefully. Formal structures include goal-oriented physical and virtual working environments, school and corresponding layouts, curriculum-based content, and methods used in teaching and study resources made available for learning activities. The complexity of these structures across the formal and information continuum suggests a dynamic of simultaneous engagements and presence. Learners can and often engage in many of these informal and formal structures simultaneously to make meaning, consciously or otherwise. In these engagements the discussion argument for PoS becomes visible. The interplay inside informal and formal is pedagogized by the discussion and collaboration forums made available for learning.

Initiative-Seduction-Sense of Intervals Continuum

Initiative and seduction are presented to account for the learner's engagement with their learning, whether it is through a deliberate initiative (learner autonomy) or through a seduction (a contextualization of learning more often presented to them by a teacher). Initiative is an open and public conscious performance in a social environment, while the seduction is an indirect and tacit activity. The sense of intervals is connected to the understanding and respect of the existence of tacit occurrence and knowledge, a phase of 'quiet water' inside human activity. Initiatives, seductions and senses of intervals form a human presence aura for PoS activities. This humaneness constitutes a collage argument for the Pedagogy of Simultaneity (PoS).

Pedagogy of Simultaneity Model

Pedagogy of Simultaneity is a narrative of the intersecting time, space and social layers constituting learning in interplay of layers of trust, discussion and collage (Gallagher, Ihanainen, 2013). The activity layer of this pedagogy is composed of three variables: the serendipitous and intentional orientation being a root and argument for trust; informal and formal meeting structures constituting a discussion argument; and initiative-seduction-sense of intervals based presences giving a human atmosphere for collage. Supporting this activity are the background layers of time, place and social presence in general. These three layers, including simultaneity in three forms, i.e. confluence (time), coexistence (place) and pervasiveness (social presence), and their emergent, complex and humane quality are so multidimensional and rich that only through the trust, discussion and collage approaches of PoS can they be fully and successfully met. PoS represents an attempt to capture and make use the simultaneous activities and engagements employed by learners to make meaning in the complex and volatile spaces targeted in these mobile learning field activities.

Time, place and human presence

There are many different layers of time the mobile learner engages with to make meaning. It is possible to speak about pointillist and cyclical time along with linear time. Learners sporadically return to discrete moments of learning (pointilist) or engage in learning through process (cyclical). These layers of time often intertwine with one another to produce overlapping time (Ihanainen, Moravec, 2011). In addition, duration can be included in time layers as a means of registering the length of the learning activity (Railly, 2012). Linear time is familiar for all of us: yesterday, today, tomorrow; at twelve, six pm and one am o´clock. Pointillist time exists in separate dots, which are in a way thrown into time-space. For instance, tweets are this kind of produced and experienced time points; they exist in and of themselves in time. Cyclic time means more intensive bursts than pointillist time. Traditionally, it was experienced in the seasons of a year. During the industrial era a corresponding cyclic activity can be seen in the rhythms of work and leisure time periods. A burst of activity is visible in online discussion, which includes both strong flows of activity and slower, quieter participation sequences. The content of the conversations proceed in these cycles.

Overlapping time refers to the simultaneous overlaps of linear, pointillist and cyclical time; overlapping time is experienced as friction (the general deterioration of the self experienced over time) and conversely as an empowering time constituent. It is important to foreground that learners engage in these time layers simultaneously and incessantly to establish a context to make meaning. In mobile learning field activities, learners are constantly engaging in linear, pointillist (data collection, geopositioned images or other media), cyclic (online discussion, chatting, reflection, composing, blogging) and overlapping time layers.

Another characteristic of mobile learning field activities are there engagements with multiple places simultaneously. Physical-social places are the personal spaces of people constituted by the actual physical and social context (niche). The shared places of people like cafes, cities, workplaces and cultures are physical-social spaces. 'Authentic' nature like forests, seas, and skies are physical places.

Modern physical-social places have appeared in virtual spaces. We exist in these spaces persistently through technology and this persistence has revealed patterns of learner engagement and online spatial orientations (see Bayne et al, 2013 in relation to the enactment of this space online in formal higher education). More and more of this engagement is generated by mobile technology. Virtual spaces can be textual narratives, written stories and descriptions; they can be multimodal assemblies, compositions and exchanges. Virtual worlds that simulate the physical-social space of our past include Second Life, gaming worlds and simulations.

Both physical and virtual places are social. The sociability of these places is realized by the fact that people share spatial information with each other. People permeate these places with their presence; in turn, this presence allows for the emergence of hybridized practices and modes of interaction. As mobile technology has become a part of humanity, i.e. as people evolve into cyborgs and we search for learning theories to embrace this transformation (Polson, Morgan, 2010), the boundaries between discrete physical, virtual, and social places have been blurred. There are only hybridized places, which are simultaneously physical, virtual and social. They coexist in the places of today and in mobile learning field activities.

Sociability is a characteristic of being human as it is embedded in time, place and other occurrences. Sociability is a phenomenon that is often experienced simultaneously in groups (multiple people experiencing a similar social reality) or individually (a person experiencing multiple social engagements simultaneously). This simultaneity is a social presence, a process of engaging with multiple social realities simultaneously, whether visible or invisible, understandable or incomprehensible (Shotter, 2011). It can most readily be described as pervasiveness.

Social presence emerges from and between individuals. Social presence between people can be listening, empathetic, and dialogic or conversational. It can also be non-listening, non-empathic and non-conversational. The latter means in practice a form of social absence, but it still has a strong impact in an actual social situation. In short, non-participation in a social activity is still a social presence. Social presence and non-presence is illustrated in these mobile learning field activities through activities that move freely between isolated or individualistic orientations (Park, 2011) that pass through communities of non-presence, (such as data collection, observations and media creation with or around non-peers) to highly socialized ones (discussion, composition, dissemination of findings or reflections with peers).

Social presence can be seen as a shared cognitive, emotional and intentional mental state or mood. Formal learning is pedagogically designed to stimulate a cognitive social presence, but includes all the other states of social presence as well. Informal and familiar meetings of people are more emotionally-based than cognitive, yet the cognitive layers are present. An intentional social activity is constituted by more or less conscious aims to achieve something, whether a formal or informal event. Mobile learning field activities engage many of these types of social presence routinely and simultaneously.

Trust, Discussion, and Collage

The Pedagogy of Simultaneity, having both the background and activity layers described above, is crystallized in the dynamic of trust, discussion and collage. In a pedagogical sense one has to trust in learning executed in expressions and acts, make possible forums for (re)creation in discussion and collaboration, and recognize the importance of collage (or assembly), to both generate and identify emerging collages of aggregated meaning. In the context of mobile learning field activities, trust is made visible through empowering learners to identify their own learning focus and process for analyzing that focus. In short, learners choose the topics of their own field

activity, either within a disciplinary context (for formal learning) or within a specific perceived need (for informal learning). Trust begins with topic selection.

Trust generates individual learning, the discussion and negotiation of mutual understanding and the collage of shared resources and compositions. Discussion emerges from trust and social presence; these mobile learning field activities are oriented to a collective negotiation of meaning and composition. Discussion is critical in establishing not only the collective negotiation of meaning, but also to developing an understanding of how possible compositions or collages of meaning will be received by the community. Collage is the stitching together of meaning through compositions, representations, reflections, or any other output. The commitment of the Pedagogy of Simultaneity explicitly to trust, discussion and collage emphasizes the simultaneous pedagogical acts found in mobile learning field activities. Trough trust, mutual collaboration and creation, mindful learners are developed.

Trust also means that pedagogically one has to do nothing. It means no to control and comparative measurement. But it also means respect, attention and time-giving presence for learners and learning, which takes place everywhere, all the time and by everyone. Trust as pedagogy leads to acts recognizing learning as a rich resource, which is owned by all people and acquired in all their possible informal and formal settings.Trust is present in all kinds of online and offline combined meetings of people. The organic energy and activity in these meetings is discussion, but it can evolve into multilateral collaborations. The basic pedagogical task is to notice and make possible these discussion sessions informally and formally at schools and workplaces and networks and in all places and forums where learners meet.

These meetings are venues for the production of learning materials, referred to in PoS as collages or montages (or assemblies). Collages first appear as aggregates of separate fragments, but then - after aesthetic orientation - they emerge by themselves as reflective wholes. They are intuitive facts, which yet are perpetually being defined. In practice all mashups, collections, summaries and other aggregates whether text-based or multimedia can be seen as collages. Collages are never external truths but personal and inviting, constructed to help the individual see and understand them by themselves. These collages are like cubist artworks in a gallery to be interpreted and used for remixing by later use by visitors, i.e. learners. The PoS collages are, in essence, OERs (open educational resources). In the PoS context it is important to realize the collage quality of OERs emerging from seeds of trust and discussion; the trust and discussion depend on the openness of open educational resources. The Pedagogy of Simultaneity is an attempt to make all these factors visible and usable in a learning context.

Conclusion

The kind of learning being enacted in mobile learning field activities is often complex and chaotic, where meaning is being perpetually constructed and context shifts to create that meaning and evolves as a response to it. This learning is a heady, complex process of the employing intellectual, social, emotional and technological tools towards a process of coming to know (Saljo, 1999). This process of coming to know is accelerated by mobile technology; mobile learning, as a result of this acceleration, is an environment of overlap and simultaneity, where layers of time, social presence, and place are engaged with repeatedly by the learner to generate meaning.

This environment of overlaps and simultaneity, along with the emergence and humaneness found in the overall quality of PoS, challenges educators to generate pedagogically appropriate responses and designs for mobile learning in field activities and to make use of them. The Pedagogy of Simultaneity (PoS) is one such response that is explicitly designed to account for the simultaneity of purpose, place, social presence, and layers of time present in mobile learning. It acknowledges that the intersections of these simultaneities are fertile learning spaces; in response to this complexity, PoS emphasizes methods that are distinctly human: trust, discussion, and collage. It emphasizes learners that "artfully engage their surrounding to create impromptu sites of learning" (Sharples et al, 2007) through social interaction and creative composition; learners that transform their habitus (Kress, Pachler, 2007) in response to both intentionality and serendipity. It is a pedagogy specifically designed for the simultaneity being generated in mobile learning.

The pedagogical approaches outlined in PoS are designed to address the particular learning environments as outlined in these mobile learning field activities, but we believe they are not exclusive to mobile learning. Indeed, the authors believe that this pedagogy has application to elearning, open learning, and informal learning. The field activities presented in this paper are merely one example of where this complexity is enacted. This is

learning in the open and it requires a pedagogically appropriate response, one that seeks to understand and make use of these mobile learning engagements. Further research is needed to determine the applicability of this pedagogy to open, informal, and elearning environments.

References

Bayne, S., Gallagher, M., & Lamb, J. (2012). Being 'at'university: The topologies of distance students. University of Edinburgh.

Brookshaw, R., Fuller, A., & Waters, J. L. (Eds.). (2012). *Changing spaces of education: New perspectives on the nature of learning*. Routledge.

Bruns, A. (2007, June). Produsage. In Proceedings of the 6th ACM SIGCHI conference on Creativity & Cognition, Association of Computing Machinery (ACM): p. 99-106.

Buchem, I. (2011). Serendipitous learning: Recognizing and fostering the potential of microblogging. Form@ re-Open Journal per la formazione in rete, 11(74), 7-16.

Colley, S., & Gibbs, M. (2012). Capturing Archaeological Performance on Digital Video: Implications for Teaching and Learning Archaeology.

Gallagher, M. (2013a). Incessant Motion through Space: Mobile Learning Field Activities in the Humanities. Kindle Edition. Retrieved August 20, 2013 from http://amzn.to/1eQGYn4.

Gallagher, M. (2013b). mLearning Workshop in Helsinki: Documenting the city through architecture, religion, sound, habitus. Retrieved October 1, 2013 from http://bit.ly/1g2jpII.

Gallagher, M. & Ihanainen, P. (2013). Pedagogy supporting the simultaneous learning processes of open education: Pedagogy of Simultaneity (PoS). Open Education 2030: Higher Education, European Commission, Joint Research Centre: Information Society Unit.

Gupta, A., & Ferguson, J. (Eds.). (1997). Anthropological locations: Boundaries and grounds of a field science. Univ of California Press.

Haapala, O., Sääskilathi, K., Luimula, M., Yli-Hemminki, J., & Partala, T. (2007, June). Parallel learning between the classroom and the field using location-based communication techniques. In World conference on educational multimedia, hypermedia and telecommunications (Vol. 2007, No. 1, pp. 668-676).

Hwang, G. J., Tsai, C. C., & Chen, C. Y. (2012). A context-aware ubiquitous learning approach to conducting scientific inquiry activities in a science park.Australasian Journal of Educational Technology, 28(5), 931-947.

Ihanainen, P. (2013). A zone between formal and informal learning. In Aaltonen, Isacsson, Laukia, Vanhanen-Nuutinen (eds.) Practical Skills, Education and Development - Vocational education and training in Finland. Helsinki: HAAGA-HELIA University of Applied Sciences.

Ihanainen, P., Moravec, J. (2011). Pointillist, cyclical, and overlapping: Multidimensional facets of time in online education. The International Review of Research in Open and Distance Learning, 12(7), 27-39.

Jacucci, G., Oulasvirta, A., & Salovaara, A. (2007). Active construction of experience through mobile media: a field study with implications for recording and sharing. *Personal and Ubiquitous Computing*, *11*(4), 215-234.

Jones, A. C., Scanlon, E., & Clough, G. (2012). Mobile learning: Two case studies of supporting inquiry learning in informal and semiformal settings.Computers & Education.

Kolb, D. A. (1984). *Experiential learning: Experience as the source of learning and development* (Vol. 1). Englewood Cliffs, NJ: Prentice-Hall.

Kress, G. & Pachler, N. (Eds) (2007). Mobile Learning: Towards a Research Agenda. WLE Centre, Occasional Papers in Work-based Learning 1.

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Marty, P. F., Alemanne, N. D., Mendenhall, A., Maurya, M., Southerland, S. A., Sampson, V., ... & Schellinger, J. (2013). Scientific inquiry, digital literacy, and mobile computing in informal learning environments. *Learning, Media and Technology*, (ahead-of-print), 1-22.

McFarlane, C. (2010). The comparative city: Knowledge, learning, urbanism. International Journal of Urban and Regional Research, 34(4): 725-742.

Otavan opisto. Retrieved October 1, 2013 from http://www.otavanopisto.fi/inenglish/otava-folk-high-school.

Park, Y. (2011). A pedagogical framework for mobile learning: Categorizing educational applications of mobile technologies into four types. The International Review of Research in Open and Distance Learning, 12(2), 78-102.

Polson, D., & Morgan, C. (2010). Towards An Intelligent Learning System for the Natural Born Cyborg. Journal of the Research Center for Educational Technology, 6(1), 185-193.

Railly, M. (2012) Bold Schools: Part I - Learner as Knowmad. Retrieved December 10, 2013 from http://maryannreilly.blogspot.fi/2012/01/bold-schools-part-i-learner-as-knowmad.html.

Robinson, C., & Sebba, J. (2010). Personalising learning through the use of technology. Computers & education, 54(3), 767-775.

Saaskilahti, K., Sippola, O., Partala, T., & Luimula, M. (2010). Location-based communication techniques in parallel learning between the classroom and the field. International Journal of Continuing Engineering Education and Life Long Learning, 20(1), 21-39.

Säljö, R. (1999). 9 Learning as the use of tools. Learning with computers: Analysing productive interactions, 144.

Sharples, M., Taylor, J., & Vavoula, G. (2007). A theory of learning for the mobile age. In R. Andrews & C. Haythornthwaite (Eds.), The Sage handbook of elearning research (pp.221-47). London: Sage.

So, H. J., Tan, E. B. K., & Tay, J. (2012). Collaborative mobile learning in situ from knowledge building perspectives.

Shotter, J. (2011). Getting it: Withness-thinking and the Dialogical--in Practice. New York: Hampton Press.

Vavoula, G. N., & Sharples, M. (2002). KLeOS: A personal, mobile, knowledge and learning organisation system. In Wireless and Mobile Technologies in Education, 2002. Proceedings. IEEE International Workshop on (pp. 152-156). IEEE.

Virsu, V.; Oksanen-Hennah, H.; Vedennaa, A.; Jaatinen, P. & Lahti-Nuuttila, P. (2008). Simultaneity learning in vision, audition, tactile sense and their cross-modal combinations. Experimental Brain Research, 2008, 186(4): 525-537.

Warriner, D. S., & Wyman, L. T. (2013). Experiences of Simultaneity in Complex Linguistic Ecologies: Implications for Theory, Method, and Practice. *International Multilingual Research Journal*, *7*(1), 1-14.