

Emerging Technologies and New Learning Ecologies: Learners' Perceptions of Learning in Open and Networked Environments

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Abstract

The emergence of networking technologies and social media is changing the way we work, collaborate and learn. This has resulted in new forms of learning practices, more participatory ways of creating and representing knowledge and new global learning networks. In the current era, learning and educational practices are becoming more open, digital and networked. Open and networked technologies provide the opportunities for online learning to offer kind of more open and flexible online learning opportunities which can bring together such a greater number of geographically-dispersed learners to experience kind of networked and collective learning mediated by online and web applications. Such open and free learning opportunities for instance are the growing interest in offering open online courses in higher education nowadays which attract many people. This paper discusses the learning activities and experiences of the participants of some open online courses who are coming from different parts of the world to online networked environments and integrate various tools and digital application in the process of their learning and interactions. This paper presents the preliminary findings of a research in progress on leaning ecologies in web 2.0 and emerging technologies and personal learning environment (PLE). The main research question for this paper is: what is the nature of learning in open and networked learning environments and what learning activities and experiences result from participating in these environments? The findings are based on an online survey, semi-structured interviews and public online contents of the participants in open online courses. This study adapted a virtual auto-ethnographic method to get involved more closely to the culture and phenomena of learning in such open online environments in which researcher was able as a learner to participate in the various activities of the courses, interact with participants to explore the processes of learning and interaction. For the purpose of data analysis and understanding the nature of learning and interactions in such open and networked environments, by reflection on socio-cultural theoretical frameworks such as social constructivism, communities of practice and connectivism, we used a rhizomatic approach to learning in networks and communities (Cormier, 2008, Engestrom, 2007, Tella, 2000) to look at different emergent and multi-directional learning activities take place in the context of such open environments and to explain how open-digital-networked technologies are used by participants of open online courses.

Keyword

Networked learning, open online course, learning ecology, PLE, higher education

Introduction

Web-based tools and networked technologies have created the opportunities for more flexible and easy accessible learning environments in higher education. They seem to offer the potential for 'pedagogical innovative' with the emergence of new forms of mobile, internet and social software technologies, which enable distributed collaboration and global learning experiences (Conole et al, 2008). Moving from bounded institutionalized learning management systems (LMS) to kind of more open and personal learning environments (PLE), the abundance of free and open educational resources (OER) and the technology-mediated possibilities to bring learners from different geographical

locations together in open virtual environments have resulted in different learning ecologies which has not been realized before. The use of these technologies which provide the opportunities for some level of personalization and also socialization in the process of learning lead to learning practices which are more engaging, networked and personalized. The learning culture of today's learner is becoming different from what it has been so far towards more personal and ubiquitous learning environments and with being more engaged in network-based activities. All this sound to blur the boundaries between formal and informal learning and the role of technology is becoming very important to fulfill this vision. As Ainsworth et al. (2005) stress "we need to integrate the best aspects of technology mediated informal learning into formal learning in order to make it possible to benefit from in-class and out-of-class learning" (P.9).

Therefore, in educational technology research there is a growing attention to explore and understand the nature of learning in such socio-technological contexts. With regards to the fact that the level of engagement of higher education students in web 2.0 environments and tools such as wikis, blogs, and many other social networking sites are growing (Sclater, 2008), researchers in learning technologies need to investigate the pedagogical applications of those emerging technologies. These engagements in emerging technologies, as Hoffman (2009) points out, seem to hold great promises and challenges for transforming education, research and practice and convey new ways of teaching, learning and collaboration.

All these promises and challenges of the impact of web 2.0 and emerging technologies and the associated pedagogies led this study to seek to understand the phenomena around the adoption these technologies in personalized and networked learning. This study seek to gain insights to the experiences and perceptions of participants of open online courses of the integration and incorporation of networked technologies and web 2.0 tools in the process of learning and collaboration. What is the nature of learning and interactions in the context of open online courses, which tools and resources are used by participates, what learning activities result from participating in these kinds of learning environments and what are the pedagogical benefits perceived by the participants of these courses?

Network Pedagogies and 21st Century Learning

The learning ecologies of the 21st century's learners require competencies and skills which enable them in more self-organized and socially contextualized learning practices. Siemens & Tittenberger (2009) discuss that with the fact that learning is social, situated, multi-faceted, self-paced and connected, social media and Web 2.0 can play important roles in self-directed learning, allowing learners the freedom of self-paced learning with the social support of contact with peers, and a sense of connectedness to other learners can be fostered. Self-directed learning seem to provide bases for the establishment of models of learning that go beyond institutionalized models, and envision new learning models characterized by the convergence of lifelong, informal, and ecological learning within a learner-controlled space (Chatti et al. 2010, b). In such frameworks, boundaries between formal and informal learning are blurring and learning can happen with more learning experience variations across different platforms and environments. The pedagogies underlying 21st century learning are also evolving to meet the requirements of the contemporary learners. "While today's learners have become increasingly reliant on social networking technologies to connect, collaborate, learn, and create and make themselves ready for the needs of the competitive global economy, the pedagogies should be tuned with the current trends and technologies (CISCO 2008, p.8).

Socio-personal technologies signal for such pedagogies which make learning to become more personal, social, participatory, distributed, ubiquitous and flexible (Chatti et al. 2010 a, McLoughlin & Lee, 2010; Downes, 2007; Couros, 2010). Networked-based pedagogies put emphasis on kind of customization of learning in online and networked world which offer greater autonomy and flexibility for learners with more personalized learning experiences "to exploit the affordances of Web 2.0 and facilitate personal choices, participation, collaboration and creative production"(Lee & McLoughlin, 2010, p.51). As results of the evolution of technology and open source software, there has been a trend in open online learning to kind of open educational practices by offering free courses and contents on the web. For instance, nowadays there various open online courses offered on the internet and available for all interested participants accompanied by free contents and resources bring open and networked learning opportunities. These initiatives call for pedagogical models to conceptualize the nature of networked learning processes in such environments. How a 21st century learner can make a sense of all this abundance and use all these tools and resources in a meaningful way?

How they can choose the tools they need and best suit their learning needs, and how they can personalize all the available tools and services for various purposes? PLE is one approach to understand and explain the complexities of such socio-technological learning environments and the nature of networked learning processes.

Networked Learning and PLE

Networked learning is a genre of technologically-mediated learning in which social media and web technologies are used to promote connections between learner, human resources, content resources and learning communities and keep continually dealing with ever-increasing amount of digital information. That is a continuous process of seeking, sensing and sharing of content and requires an open attitude toward learning and finding new things for personal and professional development and to promote connections (Drexler, 2010, Goodyear et al. 2005, Jarche, 2010, De Laat et al. 2007, McConnell, 2004, Siemens 2004). This puts more values for learner's choice and agency with promoting personal learning environment concept by selecting platforms and customizing their own personal learning landscape according to their individual need, priorities and contexts (McLoughlin & Lee, 2010). The metaphor of PLE which is conceptualized based on web 2.0 tools and networked technologies, and refers to the one's own knowledge management tools, services, resources and connections which shapes the individual's educational platform to direct learning, is promising such learning ecologies which tend to be more open, personalized and networked. PLE is in fact an approach to learning based on web 2.0 applications and emerging technologies which has been discussed and researched by many researchers to emphasize the potential of those participatory media and put more value on learner-controlled learning tools in contrast to institutionalized learning management system (e.g. Attwell 2007; Chatti et al. 2010; Downes, 2008, 2010; Drexler, 2010; Martindale & Dowdy 2010; Våljataga et al. 2010; Weller, 2009). This new ecology of learning takes the assumption that learning is multi-directional and multi-modal and learning, idea exchanges, and inquiry all take place within a dynamic system among students, teachers, and global communities with the web 2.0 infrastructures. It provides the opportunities to immediate access to information, resources and communities and to create, mash up, comment on, edit content, and allow communicating with people globally (Spires et al, 2009). This makes a PLE as means of networked learning which can nourish various social interactions across different platforms and connecting with many social and professional networks and communities.

Theoretical Perspectives on Networked Learning

Conole (2010) states that research on the use of technology in educational context and learning practices has a long history and includes different focus of inquiry such as e-learning, CSCL, technology-enhanced learning and networked learning. She further indicates some of the main theoretical perspectives that are evident in networked learning research including social-cultural theories, constructivism and activity theory, communities of practice and actor network theory. Socio-cultural perspectives provide frameworks for understanding and conceptualizing the emerging form of interaction and collaboration, distributed work and networked activities (Lipponen, 2001). Another pedagogical model of networked learning which is known as connectivism (Siemens, 2006) explains the nature of networked learning as a process of making connections with others, creating networks of personal knowledge and a "view that is congruent with the ways in which people engage in socialization and interaction in the Web 2.0 world—a world that links minds, communities, and ideas while promoting personalization, collaboration, and creativity leading to knowledge creation" (McLoughlin & Lee, 2008, P. 2). Klamma (2010) based on Siemens (2006), Downes (2005), explains connectivism as one of the new social learning theories which sees learning as:

- A process of connecting entities
- Nurturing and maintaining connections is needed to continual learning
- Ability to see connections between fields, ideas, and concepts is a core skill
- Capacity to know more is more critical than what is currently known
- Decision-making (P. 224).

So, in the previous research on networked learning various theoretical frameworks have been discussed but for the purpose of this paper I intend to undertake a rhizomatic approach to understand and explain the learning processes in technologically-based open and networked learning environments.

A Rhizomatic Approach to Networked Learning

Researching the realities and challenges of networked learning seems not to be relying on a single theoretical framework. Cormier (2008) argues that neither constructivism nor connectivism may fully represent the nature of learning processes in the online world. Although, they theorize some aspects of learning in socio-technical complexity but, we need such approaches which combine principles of all theories to explain these complexities. For today's learning with the integration of social media and Web 2.0 tools, we may not just rely on existing learning theories for explaining our learning practices and the formation of knowledge in networked and digital world, rather than tossing out old theories, instructional designers need to incorporate those elements that remain relevant and restructure them with the requirements of learning in the current era (Sontag, 2009). In an attempt to do so, Cormier (2008) describes an alternative approach to the traditional notion of knowledge and suggests a rhizomatic model of learning. In the rhizomatic model, "knowledge is negotiated, and the contextual, collaborative learning experience shared by constructivist and connectivist pedagogies is a social as well as a personal knowledge-creation process with mutable goals and constantly negotiated premises" (p.1).

Engeström (2007) while elaborating on 'communities of practices' (Wenger 1998) refer to Deleuze and Guattari's proposition of the concept of 'rhizome' to highlight the importance of horizontal and multidirectional connections in human lives, in contrast to the dominant vertical, tree-like images of hierarchy. He talks about mycorrhizae for the nature of connections and interaction in the communities and mentions that some examples of mycorrhizae-like activities at the moment are the Open Source communities. Tella (2000) for the bases of all activities in media education also refers to rhizome and argues that learning in the rhizome make you assume to take a lot of responsibility for organizing your own learning environment. Tella further discusses that the world of media education consists of an innumerable number of rhizomatic connections and learning in the rhizome characterizes global connectivity braining a lot of responsibility for organizing your own learning environment. In the context of open and distributed learning, students can create their own rhizomatically curriculum by combining their blogs, wikis, social networks, and all other digital artifacts they have on the web and link them to the particular knowledge that they discovered through discussions with others in the community.

Methodology

Aim of the Study and RQs

As explained earlier this research in-progress aimed at exploring the nature of learning in open and networked learning environments and to understand open learning practices mediated by networked technologies and web 2.0 applications (in the context of open online courses). The main study is guided by the following research questions:

- What is the nature of learning in Open Networked Learning Environments (ONLE) and what learning activities and experiences result from participating in these environments?
- What are the perceived values (experiences and perceptions) of participating in ONLE by participants of open online courses?
- How is personalized learning conceptualized through creating and using a Personal Learning Environment (PLE)?

Research Design

This study has adapted online ethnography to discover the actual activities and participants engagements in open online learning communities and networks. Online ethnography or virtual ethnography is ethnography adapted to the complexities of our contemporary, technologically mediated social world (Kozinets, 2010). The researcher's role in ethnography is crucial (Creswell, 2003). Ethnography has been used to study networking learning phenomena and technology mediated online practices (Conole 2010, Boyd 2008). We developed an online ethnographic design which researcher was a participant in the context of the research. From September 2010 until April 2011 and since then periodically I have participated in the open online courses which are being studied in this research. It was a unique opportunity as a researcher participant to take advantage of participation in these open online courses to get involved in the activities of the course and establishing closer interactions with other participants. This way I used autoethnography which as Keefer (2010) explains researcher actively situates the self within the culture being studied. Being involved as a researcher participant in the research context and activities enables to better reflect on and gain greater insights of the phenomena being studied.

Research Context and Participants

This study seeks the answers to the research problems in the context of open online learning. Participants include those who have participated in massive open online courses (MOOC). The word massive here used to indicate the kind of course which had huge number of participants from different parts of the world. But this study was not just focused on MOOC but also on such other open online course which had the same structure as MOOC but just different in the number of participants. The courses were distributed across the web, integrating many different tools and platforms such as blogs, wikis, Moodle, RSS, Twitter, YouTube, Flickr, Delicious and many other types of social media for the purpose of collecting content, aggregate different materials from different sources, remixing and reproducing them and sharing with others in different networks.

There was various level of participation in the activities of the course. Some participants were quite actively participating in many activities for instance reading the daily newspaper, taking part in weekly live discussion, creating contents on the social media platforms such as blogs, wikis, Twitter, Facebook, and using social bookmarking tools like Diigo and Delicious. But some other participants were also lurking and their level of engagement was like from just following the course discussion and topics and occasionally involving in some course activities. Because they were less structured course and it was up to the participants to choose how to get involved and what learning goals and experiences should be followed.

Data Collection and Analysis

Data were gathered by an online survey, semi-structured interviews, researcher's field notes and diaries during the course of research and public online contents of the research participants. We created a survey comprised of closed and open ended questions on an online survey making platform; SurveyGizmo and delivered it by Twitter to the participants of the two open online courses. The purpose of the survey was to develop the topics and themes for more in-depth interviews of the participants. Then in the survey we asked the respondents if they were interested in having a one-hour interview following their survey. We received number of people's willingness for interviewing which were conducted online through Skype and Google-Talk. All interviews, with the permission of interviewees, were recorded using online tools and an external voice recorder of which five were also video-recorded. Another source of data was kind of online journal of activities during the course; researcher's reflections, annotations, screen-captures of the activities which included my personal experiences and learning journey as well. Online public contents included those kinds of data of the participants' blog posts, tweets, final reflections and projects done for their courses, discussion forums available in the course page, and other sorts of data which resided in Facebook, Slideshare, YouTube, Flickr and recordings of Elluminate synchronous sessions. Interviews were transcribed and the analysis is still underway. This paper is based on the preliminary analysis of the whole data including my auto-ethnographic insights. For data analysis we went through the survey responses for each participant, and then reading the interview transcripts and tracking the online activities and contents of each one of the participants to fulfill a triangular method of analysis. In this phase of analysis and for the purpose of this paper, we used a more descriptive method adapting grounded theory open coding technique to generate main themes and concepts.

Results and Discussion

As abovementioned, the main focus of this paper was to get insights to the learning experiences and perceptions of open online courses' participants of learning in open online learning environments. The empirical context of the study was open online courses offered from some institutions in Canada which according to the definition of this research are such open online learning environments. It should be clarified that in this research the definition of learning environments is not restricted to a specific terminology but rather various terms such as 'open and networked learning environments', 'open online learning environments', 'open learning environments' and 'open, digital and networked learning environments' are all used synonymously and interchangeably. They are all refer to kind of environments which mediated by online tool, networked technologies and open source applications which can be used by people according to their needs and preferences in the process of learning and interactions.

For understanding and explaining the nature of learning in such open and networked environments this paper draws upon a rhizomatic approach to learning in open networks (Cormier, 2008, Engestrom, 2007, Tella, 2000) to look at different emergent and multi-directional learning activities take place in the context of open online courses. The purpose was to capture the learning experiences and the choice of the tools used by the participants and what kinds of interactions and engagements in different networks and communities were taking place during the course.

The methodological development was started by conducting a survey on participants' dealing with social media and tools in the course, their motivation for participating in such open learning environments, their learning activities and interactions in MOOC and how they developed their PLE during the course. Then in the interview the elaboration was more on the learning experiences and managing learning in abundance and self-organizing emergent learning (Williams et al. 2011). What is presented here is a descriptive representation of the preliminary analysis of data in a coherent way in which we looked at the responses from survey, interviews and the online public contents and artifacts to make articulated interpretations.

Learning in Open and Networked Environments: Challenging and Inspiring

The diversity of tools and resources in open online courses encourage participants to customize them based on their own learning goals and needs. In such open and unstructured setting, it was the participant choice how to be involved in the activities and experiences; which tools they are going to use, how to read the course readings, how to interact with other participants, how to share their ideas and how much they can be open in this respect. In the survey it was asked that which tools participants have mainly used during the course and for what purposes? They mentioned some tools that they were using on a routine base and others which they use according to their needs. For instance Twitter, Facebook, Blogs, YouTube, and RSS were those main tools that they have used in the online courses. Blogging was seen as one of the best way of reflecting on learning and keeping in touch with other people in the areas of interest and to creates and share one's ideas and contents. It helps develop connection by people who follow you and subscribed to your blog also their comment on the blog is a great feedback to the ideas we are writing about.

I had been contacted by some people just because I am blogging on some topics ... that's I mean amazing. I like that very much and also they asked me to blog on those issues. I didn't know what it would lead to, you don't know where it will lead but it's for showing what you know so, the blog, I love that tool. I also used it for my teaching I put my courses on a blog too (LS).

Twitter was the main tool used by almost all participants whom many of them said that it is the best tool to be connected and to share ideas and post it to the network if something needed to be asked:

"Twitter I think the best tool for networking because I got a lot of contacts through twitter, networking with people that you haven't even met before, just people having the same professional area as yourself (LS).

Being connected and developing connection across different networking platforms bring the opportunities of easy accessing to the resources and experts. For instance one of the participants mentioned that when she had a problem to figure out something during the course she had asked other participants to help and twitter was a means to connect to them:

... I tweeted the people can you please help me in this and this one of my colleagues which I follow on twitter and she tweeted things. So people kept mentioning things to me and advising me to use things and I really found a lot of help (OE).

The majority of respondents believed that participation in open online course which needs to be involved in various kinds of activities and to use many tools is motivating and inspiring but on the other hand it is time consuming and disruptive if learner cannot organize the learning in the best possible efficient way in this abundance. It also enhances learning autonomy while there are huge sources of contents and information and learner should find the way to manage them.

Learning in open online environments as experiences in MOOC was quite positively perceived by many participants nonetheless, there were some difficulties for some of them in terms of technological competencies and managing time and resources which then gradually they learned how to cope them. Keeping up with the readings and assignments and being motivated to be fully engaged in the activities are extremely challenging for many participants indeed not too miss what they really are interested in and to fulfill the obligations if they are asked to do so. While one participant said she liked the course activities: "I loved it and only wished I had more time to pursue

more of the materials and time to share”, another person while sharing the same of this eagerness to keep up with the activities but also indicates some challenges as well:

The most challenging aspect to these courses in general is being motivated to participate fully. I was formally enrolled and was very careful to complete every assignment on time and participate fully. This has not been the case for other endeavors - I manage to keep fully involved for awhile. ... Another challenge was the diversity of needs of the participants. Some threads of discussion were fascinating to me while others were not. While this is also true in a standard closed course, I felt the openness of the discussion brought in many outside interests that pulled from my own focus (LU).

Participation in open learning networks, communicating with other people, creating and sharing materials were not perceived easy by some participants in open online courses. In fact it's matter of openness and how one personally is comfortable with getting to know more people, connect to them and share their stuff and materials.

I wasn't that comfortable when in the first couple of meetings and let's say that until the end of the course even. I wasn't that comfortable that many people attended the course. I wasn't that involved with my classmates. I didn't know them I didn't have connection with them. Although we were connected on each other's blog and we had to do this and we had to connect via twitter and all of these stuff but I didn't know them (OE).

Emergent Learning and the Ecology of PLE

The affordance of social media and individual tools in the digital age has created the opportunities for learners to create their own PLE which enable them manage and organize their learning or as Williams et al. (2011) describe a 'personal learning ecology'. The participatory architecture of "learning 2.0" (Wheeler 2011, Downes 2006) which entails the processes of creating, sharing, collaborating, networking, connecting provide such a learning ecologies for today's learners which are, personalized, connected and distributed. This personal learning ecology forms while a learner integrate many tools and services in learning processes and while s/he is engaged in various networks and communities. The numerous learning activities and social interactions across various platforms happening during the period of the online courses prompt participants to engage in many communities of interest and professional networks. All these interactions, processes and tools which are incorporated by learner form a personal learning environment which can be illustrated like figure 1. It shows that how different tools were used (and can be used) by learner for different processes. Although, this is just a symbolic representation of a PLE and do not necessarily entail all these tools for all learners. The choices of the tools and how they are used all depends on the learner's needs and preferences and can have less or more than the tools shown below. It is just demonstrates that how tools and technologies are enabler means to foster a range of processes. This represents a personal learning ecology based on digital tools and application and web technologies while a learner engaged in open learning and makes tools and resources personalized.



Figure 1: Tools and Processes in a PLE

PLE is rather an approach to technologically learner-centered learning than an application or collection of tools. What PLE approach promotes is that how a learner can make sense of using those tools a services and how to apply them in the process of learning.

Various tools to connect with people and resources and conversations you know ... I see the PLE various technologies in terms of process and organization (KU).

PLE is not just a personal space but also social landscape to promote various networking processes and how a learner can personalize the sets of tools, services and resources. Participants of the online courses see PLE as tools that enable them during learning and interaction.

My PLE is always includes my laptop, or some mobile device which is connected to the internet and when I am working I have this laptop and I go around my student bringing my laptop and I usually discuss subjects with them (LS).

Another participant looks at PLE both as tools and services and also in a traditional way which includes everything like physical infrastructures that has something with learning:

To me a PLE is just jargon for the collection of tools and individual uses to organize resources in a web-based environment. If you extended its meaning, it would also include classrooms, television programs, hallway meetings, etc. As a collection of tools, PLEs have the characteristics of being controlled by the individual learner, and represent that individual's approach to material and social or professional connections (LU).

Conclusions

This study-in-progress paper provided some preliminary evidence about participants' experiences and perceptions of learning in open and networked environments. Such environments which are powered by socio-technological open source applications mainly on the web and can facilitate more flexible and easy accessing learning resources and experiences which characterized open, digital and networked. Findings present perceived affordances of such tools and technologies and the challenges of learning in those kinds of environments. The findings suggest that learning in such open and networked environments seems to have the following features:

Self-organized; in which that learners are dealing with a huge abundance of resources, tools and possibilities and they should find their ways; how to learn, which tools and resources to use, which readings go through, how to make networking and how to develop connections. As Weller (2011) talks about the 'pedagogy of abundance' such a learning is a kind of resource based learning which is "an integrated set of strategies to promote student centered learning in a mass education context, through a combination of specially designed learning resources and interactive media and technologies" (P.229).

Emergent; learning in open and networked environments is unpredictable and unprecedented. It means that no one can predict the patters of learning and what will happen during the course of learning. It's the potential and affordances of participatory media that provide such opportunities for emergence. While there is a big number of people and huge amount of resources as Williams et al. (2011) discuss emergent learning arises in which the learners organize and determine both the process and to some extent the learning destinations and both are unpredictable. However, such learning might be inspiring and motivating but also challenging for the formal education in terms of validation and assessment.

Disruptive; in such unstructured learning settings many participants found learning sort of challenging and disruptive which means that it is difficult to manage all learning activities and the level of interactions. This gives learner in on hand sense of autonomy and agency in the process of learning and on the other hand confusion and frustration in organizing learning. As mentioned above self-organized learners find the appropriate ways to manage the various learning processes such as dealing with tools and contents, setting the best out of the available resources, developing and maintaining connections and being involved in learning networks and communities. What Weller (2011) indicates that "in a world of abundance the emphasis is less on the development of specific learning materials than on the selection, aggregation and interpretation of existing materials" is something which causes some disruptiveness for the learning in the current era of abundance. Although, disruptive technologies seem to offer pedagogical innovation and can act as 'catalysts for change' (Conole et al. 2008).

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