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# Developing a Massive Open Online Course (MOOC) at a College of Education: Narrative of Disruptive Innovation?

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# DEVELOPING A MASSIVE OPEN ONLINE COURSE (MOOC) AT A COLLEGE OF EDUCATION: NARRATIVE OF DISRUPTIVE INNOVATION?

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## INTRODUCTION

The data for this case study was gathered during 2012, hand in hand with the growing media hype about MOOCs in higher education (Watters, 2012). The college of education in which the case study took place prepares educators in the spirit of humanism, social responsibility, and environmental sustainability, offering a wide range of undergraduate and graduate programs in education and teaching. When rooted in the Connectivist origins, MOOCs are seen by the authors as representing an approach to learning that should be of interest to educators preparing their learners - the teachers of tomorrow - for life and work in a knowledge society. Connectivism is based on the idea that knowledge is distributed across a network of connections (Downes, 2007), and therefore that learning consists of the ability to construct and traverse those networks (Siemens, 2005). Connective knowledge is the knowledge that results from connections among properties of different entities. As a theory developed in an age of abundant information and connections, Connectivism assumes that the learner's role is not to memorize or even understand everything, but to have the capacity to find and apply knowledge when and where it is needed (Anderson & Dron, 2011). In line with Bruns's concept of 'produsage' (Bruns, 2008), Connectivist learning is also based at least as much upon production as consumption of content, while the role of the teacher is both a novel role – to enable collaborations with and among the learners in order to create and re-create content, and a constructivist role – to design interactions in which learners make connections with existing and new knowledge resources.

Connectivism is an approach to learning and teaching requiring radical changes in thinking on the part of all stakeholders at the educational institution in which a Connectivist MOOC is to take place. The type of learning that often occurs in Connectivist MOOCs appears to be based on processes that educators indeed wish to encourage in their students in order to better prepare them for the

future. For example, Mioduser, Nachmias, and Forkush-Baruch (2008) discuss the new literacies that have to be developed for living and working in the knowledge society, which would probably subsume the traditional literacies of reading, writing, and numeracy. They point to seven literacies: multimodal information processing, navigating the infospace, communication literacy – which includes "mindful, knowledgeable, and ethical use of a wide range of communication means, using multiple communication channels… in various interaction configurations… for different purposes" (p. 31), visual literacy, "hyperacy" – the ability to function in hypermedia environments, personal information management, and coping with complexity. These new literacies are deeply related to learning in the knowledge age in general and to learning processes in Connectivist MOOCs in particular.

There is a wide acceptance therefore of the idea that such a change in conceptualizing learning and teaching should be considered in colleges of teacher education; there is also no doubt that resistance will present itself. From a pedagogical point of view, the MOOC phenomena redefines what is meant by "learning," "teaching," and "assessment," and at the same time blurs the boundaries between them. It is not self-evident that the institution, which has its established content foci, instructional approaches, and organizational structure and practices, would welcome courses embodying such departure from what has been defined as normative. On the individual level, professors and administrators in the educational institution might also regard mainly the potential threats for their interactions with students and colleagues, for their career and for their professional opportunities and development. In other words, MOOC has a disrupting potential, hence the title of this article (Christensen, Baumann, Ruggles & Sadtler, 2006; Christensen, Horn & Johnson, 2008; Morris & Stommel, 2012; Schrire & Levy, 2012).

The case study reported here sought to listen to the organizational voices regarding an initiative to develop a MOOC for Hebrew-speaking student teachers, focusing on the Connectivist MOOC model as an example of innovation and organizational change. Based on in-depth interviews with stakeholders in the college, and using a methodology for analyzing organizational transformation triggered by the adoption of computing technologies, a narrative network was constructed from story fragments with potential connections. The narrative methodology – itself mirroring many aspects of Connectivism in the broad sense of emphasizing connections and networks – enables the compilation of stories told from different perspectives, based on encounters with the people identified as potential partners, and the tracing of actions and reactions when the idea of the Connectivist MOOC and its affordances were placed as the focus of the discussion. The stories that emerged from the interactions with institutional

stakeholders reflect how such an initiative involves an organizing of people in relation to a technology.

## MOOC AS A PEDAGOGICAL INNOVATION

"MOOCs have been around for a few years as collaborative techie learning events, but this is the year everyone wants in", says a New York Times article in November 2012[1]. "MOOCs (Massive Open Online Courses) are the educational buzzword of 2012", adds Sir John Daniel. The media hype about MOOCs in higher education has focused on their massive scale; however, the real revolution – as Daniel puts it - is that "universities with scarcity at the heart of their business models are embracing openness" (Daniel, 2012).

The first MOOC took place in 2008 as an open online course at the University of Manitoba, Canada. The course, Connectivism and Connective Knowledge (CCK08) was facilitated by George Siemens and Stephan Downes, who have been developing the pedagogical theory of Connectivism and have regarded MOOCs as practical implementations of their theory. MOOCs of that type were later labeled "Connectivist MOOCs" (cMOOCs), to distinguish them from the current wave of MOOC offerings that share little with Connectivist pedagogy (xMOOCs, Downes, 2012).

Learning in cMOOCs reflects processes in which information is characterized by rapid change and renewal, is collectivized, poorly organized, and incompletely evaluated (Kop & Hill, 2008). This vague nature of unorganized "knowledge in pieces" (Disessa, 1988) sets the ground for each learner to construct a personal learning network (PLN), by eliciting what is personally meaningful from the comprehensive network of information and interactions.

Learning in cMOOCs is also "…highly social. The learning comes from content presented by a lecturer, and then dialog via social media, where the contributions of the participants are shared" (Quinn, 2012). cMOOCs are considered revolutionary in that they erase existing boundaries between the institution and the world "outside" it. Such Connectivist-based MOOCs call into question academic responsibility and institutional accountability, as well as the professor and the institution as the authorizers of knowledge.

MOOCs of all types are considered to provide new models for learning at a time when traditional school learning is widening the rift between learners' experiences in and of the world and their experiences in formal school settings. The type of learning that has been thought to occur in MOOCs appears to be based on processes that educators wish to encourage in their students (Dede, 2008). Anderson (2008) pinpoints two major forces shaping the knowledge

[1]"The Year of the MOOC" http://www.nytimes.com/2012/11/04/education/edlife/massive-open-online-courses-are-multiplying-at-a-rapid-pace.html?pagewanted=1&_r=1

society: “greater intercultural interaction, enabled by global electronic networks, and an economic system in which knowledge functions as a commodity” (p. 7). In the face of such a “given,” the global citizen needs to learn how to construct knowledge and develop adaptability, the ability to work in teams, and skills relating to the retrieval, organization, and critical evaluation of information (Mioduser, Nachmias, & Forkush-Baruch, 2008). MOOCs in general "promise to offer flexibility, affordable access … for whoever is interested in learning, which have been seen as disruptive innovation to disrupt the existing higher education provisions" (Yuan & Powell, 2013, p. 3). In short, they actualize or attempt to actualize these desirable learning processes.

In Connectivist MOOCs the disruption might be amplified. According to Connectivism, even Constructivist pedagogies which have as their central focus the knowledge that is constructed by people communicating or working together on given tasks (Schrire, 2004) are not sufficient to explain the learning processes whereby people will learn and act in the knowledge society of the 21st century. Both technological and social networks thin (Siemens, 2010) and might even remove classroom walls. These networks inevitably subvert the classroom-based roles of the teacher as these have been “taken-as-shared” (Cobb, Yackel & Wood, 1992) in Behaviorism, Cognitivism and Constructivism alike. In addition to the obvious technological innovation, we therefore see the Connectivist model as aiming to bring about change and innovation to the college of education on a number of levels:

- Pedagogical – with a redefinition of what is meant by “learning”, “teaching”, and “assessment”. The redefinition of pedagogy will affect learners and teachers alike.
- Content – once a traditional course (even a traditional online course) becomes a MOOC, it demands deep-level revision of content. In addition, as the content is distributed and takes on a “life” of its own, independent of its point of origin, a Connectivist MOOC necessarily involves the erosion of traditional boundaries regarding content creation, development, authorship, and copyright.
- Organizational and cultural – the MOOC instructors have to collaborate in ways that they have probably not before experienced and must therefore restructure their courses.

It is against this background that a Connectivist MOOC was seen by the authors as representing suitable preparation for developing not only specific content knowledge, but also the 21st century literacies and pedagogies. Furthermore, the cMOOC became for us an example of pedagogical innovation (Levy & Baratz, 2014) and an object of inquiry into organizational change and leadership. We therefore initiated a conversation within our college of education, focusing on the idea of developing a Connectivist MOOC for Hebrew-speaking

student teachers, while listening carefully to the personal, pedagogical and organizational voices involved in the conversation.

## METHODOLOGY

The idea to set up a cMOOC at the college was proposed precisely at a time when the college was itself interested in pedagogical change and innovation, investing in ICT infrastructure, and had explicitly acknowledged the importance of supporting faculty and students in ICT-based projects. Building on the grounds of action research (McNiff, 2002; Keiny, 2002), the main objectives for the first cycle (throughout the 2011-2012 academic year) were to develop a cMOOC dealing with research methods and to involve the course instructors in the development on a voluntary basis, while documenting the development process and the design discourse. The objective for the second cycle (the 2012-2013 academic year) was to pilot the cMOOC while collecting qualitative data from participants (students and facilitators - those instructors who were involved in the preparatory stages in the first cycle).

It is important to note that at the time of the first cycle no MOOC existed in Hebrew, and many technological challenges were anticipated in setting up a Hebrew-language MOOC.As has been noted above, a number of additional challenges were also anticipated, including resistance to change, formal consent incompatible with actual participation and collaboration, and budgetary constraints. Indeed, it has become evident as early as at the beginning of the process, that even if the organization is progressive and welcomes pedagogical change and technological innovation, it is not immediately prepared to change existing courses which are satisfactorily meeting the needs of the learners and fulfilling the professional aspirations of faculty. Therefore, as the process has unfolded and obstacles have emerged to implementation of the proposed research methods cMOOC, the initial proposed content focus and context have undergone changes. Consequently, the original plan has been replaced by a number of alternatives, and these have been discussed with the relevant stakeholders. Overall, ten interviews were conducted with professors and department heads at the college throughout the two action research cycles. In addition, ideas discussed during research meetings were also recorded and transcribed.

The interviews with stakeholders whom we identified as potential partners in the initiative to establish a cMOOC at the college of education were 60-90 minutes each. The analysis of the data (both interviews and research meetings notes) was directed towards constructing a narrative network (Pentland & Feldman, 2007), which is thought of “as a device for representing patterns of ‘technology in use’” (p. 781). Pentland and Feldman use the term network “to draw attention to both potential and realized interconnections between actants and actions and the fluidity of these interconnections” (p. 781). The “narrative” aspect

is rooted in a philosophical perspective that "different interconnections make different stories" (p. 781). This approach has roots in actor-network-theory (ANT) (e.g. Latour, 2005).

In our case, each story involves a number of actants: the authors, the potential coalition partners, and the idea of the MOOC with its affordances. In ANT, actants include both human players (actors) and non-human entities such as an idea, a tool, a computer interface, etc. (Latour, 2005). An affordance refers to the possibilities latent in any part of the environment vis à vis an agent. Gibson (1977), who first coined the term in relation to animals interacting with their environment, defines an affordance as the opportunities for action provided by a particular object or environment. Norman (1988) applied the concept of affordances to understanding people's interactions with everyday things and computer interfaces alike. Just as an everyday object like a door handle offers possibilities for opening the door by turning it while simultaneously pushing or pulling the door (and something in the design of the object will hint at its use), so computer interfaces should be designed in such a way that their use is suggested to the user. Norman's ideas have significantly contributed to the field of human-computer interaction (HCI) and influenced the development of principles of usability in the design of computer interfaces.

What is specifically relevant to the present paper is that the concept of affordances foregrounds the notion that things – in our case, the Connectivist MOOC – can be characterized by a "psychology" or that they have embedded within themselves properties for action (Kirkeby, 2003).

The narratives that emerged from our interactions with people whom we identified as potential partners reflect how such an initiative involves an organizing of people in relation to a technology. In our case, the potential affordances of the technology at the center of the initiative were seen as having a possible destabilizing influence on the existing practices of the organization. That disruptive influence is described in what follows.

## FINDINGS: THREE NARRATIVES OF DISRUPTION

The narrative methodology – itself mirroring many aspects of Connectivism (in the broad sense of emphasizing connections and networks) – enables us to compile stories told from different perspectives, based on our encounters with the potential partners we contacted, and to trace actions and reactions when the idea of the cMOOC and its affordances were placed as the focus of the discussion. Each story presents the perspective of at least one potential partner in interaction with us (the authors) as initiators of the cMOOC idea. This methodology is reflected in Pentland and Feldman's (2007) observation that "anything that influences the 'plot structure' is organizationally significant" (p. 784). The analysis resulted in three reconstructed narratives, briefly presented next.

## "DON'T SHAKE THE GROUND"

The title of the first story reflects the arguments used by one of our interviewees who discussed with us the tension she saw between the potential transformations the Connectivist MOOC initiative might bring about, and the existing organizational practices within the college of education.

"A course is something that begins, something that ends, something that has a topic, and that's about it" says Downes explaining what he sees in each of the four letters of MOOC (Downes, 2014). Our first plan picked the topic of research methods as a possible suitable context for a pilot cMOOC in the college of education, and the students in the Teacher Training for Graduates program as possible participants in the pilot. However, shortly after developing our first plan of action, it became clear from a discussion with Anna – one of the department heads[2] - that the specific context was not acceptable since the existing course had itself undergone numerous transformations and had only that year achieved the goals that had been set for it. The instructors and students had reported being satisfied with the newly transformed course so any additional transformation – especially one requiring a total change of direction – was not perceived by the organization as appropriate at the time. One typical argument against setting up the cMOOC in the proposed context was expressed as follows: "The instructors have been through enough changes in the development of the existing course, and they will be unwilling to change things again, especially if we are talking about such a radical change of emphasis." (Interview with Anna, September, 2011).

Alongside the arguments Anna brought against establishing a Connectivist MOOC in the specific context we proposed to her, she was in favor of the general idea of establishing a MOOC at the college and encouraged us to pursue the initiative in relation to an alternative disciplinary field. We therefore reconsidered the plan and decided to direct our efforts to finding a more organizational-appropriate context.

## OPENNESS IN THREE ACTS

A second and more complex narrative deals with the issue of openness. It cuts across at least three sub-plots, each a few months apart from the others. Most of the actants (people and technologies) were the same, or they referred to one another across the story plots. The connection between the chronologically first narrative and the two later ones became apparent to the authors only a short while before a second interview with Beth, coordinator of the Social Involvement program of the college. The reflections on these connections are deliberately

[2] Pseudonyms are used to refer to the various stakeholders or potential partners in developing a cMOOC at the college of education.

presented as interruptions to the chronological sequence since it is the reflections themselves that helped us put together the analysis.

### *STORY I: VISION OF AN OPEN BLOG*

The first sub-plot took place in 2010, about a year before the cMOOC initiative was even conceptualized by the authors (in May 2011). The first sub-plot involved a proposal by one of the lecturers in the program, Jake, to set up an open blogging environment for one of the courses in the Social Involvement program of which Beth is the coordinator. In retrospect, the blogging environment was to include many elements that also characterize cMOOCs, but these were not identified as such by any of the people involved. The idea had not been followed and no such environment had been designed. Additional details on first sub-plot are presented below – as a flashback in the framework of the third sub-plot (Story III).

### *STORY II: VISION OF AN OPEN LEARNING ENVIRONMENT*

The second sub-plot is set in March 2012 when the authors approached Beth with a proposal to set up a cMOOC in order to bring together various inter-linked aspects of the courses comprising the program. In our search to pinpoint an appropriate context, we decided that the openness of such an online environment might answer many of the needs arising from the courses. Each of these courses contains both a theoretical and a practical component, and as communicated to us by Beth, what was needed was some way of connecting between the theoretical and practical components of each course, and between all the courses pertaining to the program at the college. This potential connection between all the courses formed the focus of the meeting between us – the authors and Beth – in March 2012. We presented the theoretical background underlying MOOCs and explained how such an online environment could help to create connections between the various courses, and between the theoretical and practical aspects of the program. Beth clearly expressed interest but requested that we continue to flesh out the idea and return to her with a more developed proposal that she could introduce to the course lecturers at a later date.

A few weeks passed, during which we reassessed the objectives of the cMOOC initiative and came up with a plan. During this period, we met with the lecturer whom we considered would be a potential partner in the revised initiative, Jake, and realized that our initiative shares many similarities to the one he had presented more than a year earlier (Story I).

### *STORY III: OPENNESS VS. CONTROL*

The setting for the third sub-plot was a second meeting with Beth in May 2012. Beth was asked to recall the prior initiative (Story I). This initiative – sharing

similar characteristics to our conception of a cMOOC although it had not been described as such at the time – had essentially been rejected. It is interesting to consider, in retrospect, the basis for the rejection since what happened then sheds light on the factors to be considered when proposing such an initiative within the educational establishment.

In her reconstruction of the earlier meeting, Beth mentioned that it had involved a number of people whose positions could have made them potential partners in the endeavor, including Jake. She mentioned that one of the main objections was that the open blog envisaged by Jake would bypass the college's official Internet site, and that the issue of locus of control was also voiced by various attendees. Although, in retrospect, the authors consider the issue of locus of control to be the main one underlying resistance to the establishment and implementation of a cMOOC in an institute of education, the objections at the earlier meeting focused mainly on the issue of the website as a marketing conduit. Beth's vision for the Social Involvement program was different than Jake's in a number of aspects. First, she had had a more modest agenda than Jake, and had felt she would be satisfied with a purely informational website about the Social Involvement program, which represented the official voice of the organization. Second, she herself did not come from the world of online social networks and blogging, so she did not fully appreciate how it could promote the agenda of her program. Third, only a small handful of lecturers in the program were actively engaged in social networking and blogging, so that they too would not have felt a need for it in the framework of their courses. Most important, the core part of the program was anyway taking place in the "real" (non-virtual) world. The real action was out there, and not in the social network of the blogosphere.

At the later meeting on which this third narrative is based, the authors raised the issue that the existing program website – while detailing all the related programs and participating groups – was characterized by a marked absence of links to other sites. The online "mirror" of the Social Involvement program was anything *but* social. Beth concurred with this observation, and shared her plans to revamp the material on her site and to connect it to other relevant sites. As it emerged during our analysis, the main obstacle to openness as is reflected by the cMOOC idea is the fact that cMOOCs may subvert the organization's agenda by placing the locus of control outside the boundaries of the organization.

## CONNECTIVIST MOOC AS A DISRUPTIVE INNOVATION

The actants in this story are the authors themselves. Awareness of the broader contextual implications occurred when the authors began to consider how a Connectivist MOOC, almost by definition, will break the boundaries of the institution that gives birth to it since the locus of control moves from the

institution, or from the lecturer who is an official representative of the institution, to the students and people outside the institution itself.

Awareness of the potential tension between the affordances of the Connectivist MOOC and the institution's organizational culture took place at a particular moment, when discussing the objections that had been raised in the first narrative titled "don't shake the ground" and when considering how to revitalize the initiative described in the second narrative titled "openness in three acts". It was then that we realized that Connectivist MOOCs may subvert the organization's agenda by placing the locus of control outside the boundaries of the organization: "A MOOC goes beyond the time and space barrier reflected in traditional pedagogy, even in traditional online pedagogy. It breaks the barriers between the natural technological living space of the learner and the LMS set up by the instructor." (Authors meeting, May 2012).

In an educational organization, "established" courses are those around which there is consensus by the "establishment." The educational establishment may be understood in the broad sense of what is accepted by the society's education system, and in the specific sense of what is accepted by the specific institute of education. Since the implications of these conclusions were far-reaching, we decided to verify them and approached Beth again, as well as additional persons whom we identified as actants in these events. This led to Story III presented above, titled Openness vs. Control.

## CONNECTING THE THREADS OF THE NARRATIVE NETWORK

The stories gathered in our case study, a few of which we have presented in more details above, would remain narrative fragments (Pentland & Feldman, 2007) unless a deliberate attempt were made to show how they constitute part of an organizational network. They point out: "Actants are connected through actions into narrative fragments" (p. 789). Each of the stories presented in the previous section is, indeed, a narrative fragment. However, Pentland & Feldman (2007) also observe: "Narrative fragments are connected with one another in the construction of narratives" (p. 789). They illustrate – and visually depict – how it is possible to construct a narrative network out of a number of narrative fragments in the context of their own case.

In order to depict the narrative network of our cMOOC initiative, including the three sub-plots abovementioned as well as other stories gathered throughout this case study, we constructed Figure 1 in accordance with the example brought by Pentland & Feldman (2007).

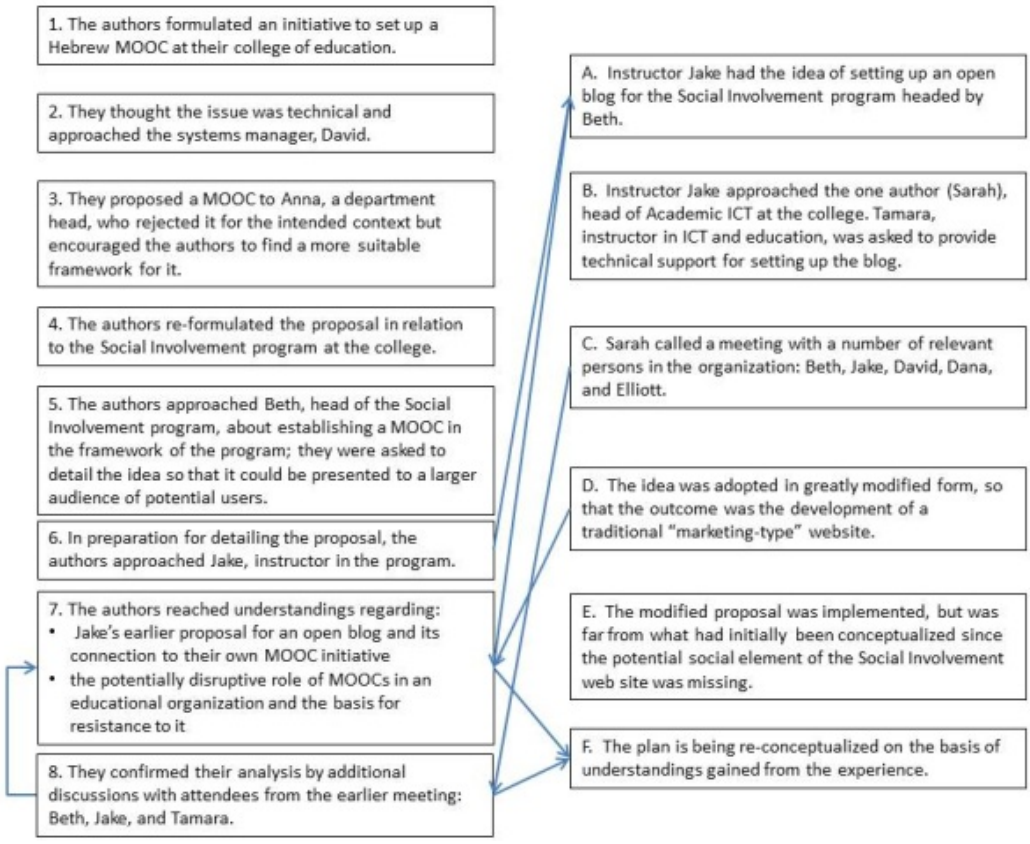


**Figure 1**: The Narrative Network of the cMOOC Initiative

It is possible to see how parallel stories involving the same actants gained coherence as we authors connected the fragments into a single network. The narrative network can help to identify fragments that might get associated with other fragments in efforts to change organizational practices. For example, narrative fragments 7 and 8, referring to the authors' awareness of what a cMOOC really means in an educational organization as is presented in Story III above - can be foregrounded in any subsequent discussions on moving forward the cMOOC initiative. It can be juxtaposed with narrative fragment D (which evolved from the vision described in Story I above), to exemplify how a cMOOC initiative can be diverted in directions that, albeit compatible with the organization's existing practices, contradict the organization's vision and purported practices. The contrast between these two narrative fragments parallels the distinction made by Pentland and Feldman (2007) between the ostensive and the performative aspects of any organizational routine. Whereas the performative

aspect refers to actual practices, the ostensive aspect refers to the participants' awareness and understandings of these practices.

The innovative idea of the cMOOC turned out in our case study to be perceived as disruptive and thus, practically, unwelcomed. The narrative analysis of the actions characterizing the implementation shows how the affordances of cMOOCs and its innovative pedagogy may subvert the mainstream agenda of an organization and its established practices. This understanding, reflected in a node connecting between a number of narrative fragments comprising the stories presented earlier, seems valuable for making future plans to establish a cMOOC in its appropriate context.

## SUMMARY

This article echoes some of the organizational voices heard throughout the initiative of developing a cMOOC for Hebrew-speaking student teachers at our College of Education. The narratives that emerged from our interactions with people whom we identified as potential coalition partners reflect how such an initiative involves an organizing of people in relation to a technology. Applying narrative network methodology to make sense of the events, we present the experiences as a number of stories whose inter-connections become apparent following narrative analysis. The analysis has raised significant questions regarding the organizational context in which a cMOOC may be implemented and has implications for understanding organizational transformations in light of technological innovation. In our case, the potential affordances of the technology at the center of the initiative were seen as having a possible destabilizing influence on the existing practices of the organization. In the stories exemplified above, openness emerged as playing a crucial part, when one of the main objections to both the vision of the open blog (Story I) and the idea of the cMOOC (Stories II, III) was that they would bypass the college's official Internet site, directing Internet traffic and learning opportunities away from the college site.

As can be heard by the organizational voices arising from this case study, a cMOOC, almost by definition, will break the boundaries of the institution that gives birth to it since the locus of control moves from the institution, or from the lecturer who is an official representative of the institution, to the students and people outside the institution itself. From an initial assessment that the main issues in setting up a cMOOC in our college of education would be technical, it became clear that cMOOCs can turn education on its head as "control is no longer with the teacher or teaching agent as in behaviorism, or with the learner, as in constructivism, but distributed, everywhere, and nowhere…" (Authors meeting, May 2012).

Let us close by pointing out that although the above analysis is based on data gathered from stakeholders in a specific higher education institution, we believe that it has implications for understanding organizational transformations in light of technological innovation that reach far beyond the specific college of education. For the last few years cMOOCs have emerged as both pedagogical and technological innovation, with the power to affect the academy through disruption. This case study shed light on cMOOC-related issues like openness, authorship, and control. We recommend continued study of these issues in other educational institutions.

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## REFERENCES

Anderson, T., & Dron, J. (2011). Three generations of distance education pedagogy. *International Review of Research in Open and Distance Learning, 12*(3). Retrieved December 11, 2011 from http://www.irrodl.org/index.php/irrodl/article/view/890/1663 .

Bruns, A. (2008). *Blogs, Wikipedia, Second Life, and Beyond: From Production to Produsage*. NY: Peter Lang.

Christensen, C.M., Baumann, H., Ruggles, R., and Sadtler, T.M. (2006). Disruptive Innovation for Social Change. *Harvard Business Review* 84 (12), 94-101.

Christensen, C.M., Horn, M.B., and Johnson, C.W. (2008). *Disrupting Class: How Disruptive Innovation Will Change the Way the World Learns*. New-York: McGraw-Hill.

Daniel, J. (2012). *Making Sense of MOOCs: Musings in a Maze of Myth, Paradox and Possibility*. Unpublished report, available online http://www.tonybates.ca/wp-content/uploads/Making-Sense-of-MOOCs.pdf .

Dede, C. (2008). Theoretical perspectives influencing the use of information technology in teaching and learning. In J. Voogt & G. A. Knezek (Eds.), *International handbook of information technology in primary and secondary education* (43-62). New York; London: Springer.

Disessa, A. A. (1988). Knowledge in pieces. In G. Forman & P. Pufall (Eds.), *Constructivism in the computer age* (49-70). NJ: Lawrence Erlbaum Publishers.

Downes, S. (2007). An Introduction to Connective Knowledge. In Hug, T. (ed.): *Media, Knowledge & Education - Exploring new Spaces, Relations and Dynamics in Digital Media Ecologies*. Proceedings of the International Conference, Innsbruck: Innsbruck University Press.

Downes, S. (2012). OLDaily, Jul 17. Retrieved August 4, 2012 from http://www.downes.ca/archive/12/07_17_news_OLDaily.htm

Downes, S. (2014). The MOOC of One. Retrieved May 10, 2014 from http://halfanhour.blogspot.co.il/2014/03/the-mooc-of-one.html?m=1

Gibson, J.J. (1977). The theory of affordances. In R. Shaw & J. Bransford (eds.), *Perceiving, Acting and Knowing*. Hillsdale, NJ: Erlbaum.

Keiny, S. (2002). *Ecological Thinking: A New Approach to Educational Change*. Lanham, MA: University Press of America.

Kirkeby, A. (2003). Affordances & Activity Theory: an information ecology approach to HCI. Online Project, University of Aarhus. Available December 24, 2011, from http://anders.kirkeby.com/anders/docs/TrekTrack.Report.MMI.pdf.

Kop, R., & Hill, A. (2008). Connectivism: Learning Theory of the Future or Vestige of the Past? *International Review of Research in Open and Distance Learning, 9*(3). Retrieved December 11, 2011 from http://www.irrodl.org/index.php/irrodl/article/view/523/1103

Latour, B. (2005). *Reassembling the Social: An Introduction to Actor Network Theory*. New York: Oxford UP.

Levy, D. (2011). Lessons Learned from Participating in a Connectivist Massive Online Open Course. Paper presented *at the Emerging Technologies for Online Learning Symposium (ET4Online),* the Sloan Consortium, San Jose, CA.

Levy, D., & Baratz, L. (2014). How do Teacher Educators Relate the Term "Pedagogical Innovation" to their Use of Educational Technology. *The 2014 Higher Education Teaching & Learning - HETL Conference*, Anchorage, Alaska (May 31-June 02).

Levy, D. & Schrire, S. (2012). Issues in developing a Massive Open Online Course (MOOC) for non-English speakers. *NMC Summer Conference,* Boston, MA (June 12-15).

McNiff, J. (2002). *Action research*. London: Routledge Palmer.

Mioduser, D., Nachmias, R., & Forkush-Baruch, A. (2008). New Literacies for the Knowledge Society. In J. Voogt & G. A. Knezek (Eds.), *International handbook of information technology in primary and secondary education* (23-42). New York; London: Springer.

Morris, S. M., & Stommel, J. (2012). A MOOC is not a Thing: Emergance, Disruption, and Higher Education. *Hybrid Pedagogy, a Digital Journal of Learning, Teaching, and Technology*, November 19, 2012. Retrieved June

4, 2013 from http://www.hybridpedagogy.com/Journal/files/MOOC_Emergence_Disruption_and_Higher_Education.html

Norman, D. (1988). *The Psychology of Everyday Things*. New York: Basic Books.

Pentland, B. T., & Feldman, M.S. (2007). Narrative Networks: Patterns of Technology and Organization. *Organization Science*, 18 (5), 781-795.

Quinn, C. (2012). MOOC reflection. Learnlets - Clark Quinn's Learnings about Learning. The Official Quinnovation blog, Posted February 29, 2012. Retrieved August 4, 2012 from http://blog.learnlets.com/?p=2562 .

Schrire, S. (2004). Interaction and Cognition in Asynchronous Computer Conferencing. *Instructional Science*, *32*, 475-502.

Siemens, G. (2005). Connectivism: A learning theory for the digital age. *International Journal of Instructional Technology and Distance Learning*, *2*(1).

Siemens, G. (2010). Teaching in Social and Technological Networks. *Connectivism* blog entry on Feb. 16, 2010. Retrieved Nov 30, 2011, from http://www.connectivism.ca/?cat=3

Siemens, G. (2012). *Adjacent possible: MOOCs, Udacity, edX, Coursera*. xED Book Blog, Retrieved November 7, 2012 from http://www.xedbook.com/?p=81

Watters, A. (2012). The Language of MOOCs. *Hack Education blog*, posted June 7, 2012. Retrieved August 4, 2012 from http://www.hackeducation.com/2012/06/07/the-language-of-moocs/

Yuan, L., & Powell, S. (2013). MOOCs and Disruptive Innovation: Implications for Higher Education. *eLearning Papers* 33. Retrieved June 8, 2013 from http://elearningeuropa.info/en/article/MOOCs-and-disruptive-innovation%3A-Implications-for-higher-education

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[i] **Dr. Dalit Levy** has more than twenty years of international experience in research and development in the intersection of Computer Science Education and Educational Technology. She earned her Ph.D from the Technion – Israel Institute of Technology and participated as a post-doctoral fellow in the TELS project (TELS – Technology-Enhanced Learning in Science), where she led the development of web-based science learning materials with The Concord Consortium – a non-profit educational technology organization from Concord, MA who has been leading the development of the Molecular Workbench software as part of the TELS grant.

Currently, she is heading the newly established and unique B.A. program in Community Information Systems at Zefat Academic College, and is teaching M.Ed. courses in Computer Science and in Research Methods at the Kibbutzim College of Education, the largest institute of

teacher education in Israel. In addition, she has been leading the Educational Technology thesis seminar, advising M.Ed students, and supervising students who conduct qualitative research as part of their M.Ed studies at the Kibbutzim College of Education.

Dalit has been taking part in research collaborations like the Innovative Pedagogy Network in Israel, the "Program by Design" group in the US, and the MOOC research group internationally. She favors working in collaborative interdisciplinary environments and is open to new initiatives that merge pedagogy and technology, involve research and teaching, and connect communities of practice. (corresponding Author). Email: dalit.levy@smkb.ac.il;

[ii] **Dr. Sarah Schrire** is an independent researcher whose pedagogical and research interests converge at the meeting point between content, pedagogy, and digital technologies.

She was a pioneer in the integration of computers in teaching and learning in the mainstream school system in Israel, where her early career was focused on English teaching. She earned a PhD in Computing Technology in Education from Nova Southeastern University in the United States and a second PhD in English Literature from Bar-Ilan University in Israel. In her research, which has been published widely, she has explored the dialogical affordances of online tools such as forums and wikis and the implications of online collaboration for learning in general and for the act of literary interpretation more specifically.

She has been closely involved in teacher education for more than twenty years and has been at the forefront of online course development, advancing web-mediated learning in her courses at the Kibbutzim College of Education and the Mofet Institute in Israel. She headed the pedagogical ICT unit at the college for five years where she planned and implemented faculty support programs. She now works for a private company in the field of online materials development for ESL/EFL, thus merging her experience of English language pedagogy with knowledge of digital technologies.