Special Edition: Volume 15, Number 2: June 2014
ISSN: 1535-0975

The Problem of Learner Control in Networked Personal Learning Environments

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Special Edition: Volume 15, Number 2: June 2014
ISSN: 1535-0975

Abstract

The purpose of this paper is to examine the ramifications of networked learning as it relates to the learners' agency in the presence of a new learning environment. Not only has learning become transformed through the use of social ICTs, the learner is now placed at the very centre of the act of learning, to the point where it is possible to question the continued role of teachers or indeed of learning institutions in general. The question of learner autonomy has been the object of empirical research from the 1970's to the present. This paper argues that there is a need for further research that takes into account the features of personal learning environments, namely learner control, self-directed learning, the distribution of power in networked-based communication systems, and some intrinsic characteristics of web-based learning that require an increased awareness on the part of the learners. One goal of this paper is to contribute to a framework for conducting such research.

Freedom to learn

With the emergence of peer-to-peer networking and many-to-many publishing, there is a renewed interest in forms of learning that are not bound by the traditional controls of educational institutions. Learning materials, tools and interactivity can now be accessed readily and freely on the web, to the point where the question appears quite unavoidable as to the continued relevancy of structured learning environments such as classrooms and programmed instructional materials in the age of social computing. The many features of what has been variously called "Web 2.0", "P2P communication", or "social networking", naturally point to an alternative to programmed instruction, namely, participation in a collectively generated learning process that is facilitated by network interactivity.

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The notion of freedom from educational institutions has intrigued educators not only since the appearance of web technologies, but also for some time earlier. From Socrates' notion of 'self-learning', to Illich's famous plea in 1971 for "deschooling society", and to today's yearly proceedings of the International Symposium on Self-Directed Learning, the literature is replete with references to learner autonomy and learner self-direction, which are typically promoted as opportunities for adults to exercise their natural capacity for independent learning without the cumbersome interference of formal institutions. Here is a telling quote from Jean-Jacques Rousseau's *Émile*:

> *"There is only one man who gets his own way – he who can get it single-handed. Therefore freedom, and not power, is the greatest good. This is my fundamental maxim …and all the rules of education spring from it."*
>
> Rousseau, 1762: 1972, p. 48

The new web connectivity evokes a world where learners are free to seek and build knowledge unconstrained by the traditional gatekeepers, while losing nothing in the trade-off in terms of access to text, media, or people. This shift does not represent a noticeable change in the types or the quality of resources that are available for learning, any more that it can be said to provide anything different from the relation of learners with 'knowledgeable others' as a universally recognized means of learning. What is different in the networked environment is that the almost infinite range of possibilities for retrieval and interaction gives learners unprecedented control over the objects of their learning, and the means through which to achieve it. If it is to mean anything at all in the end, the notion of *Personal Learning Environment* (PLE) is about allowing learners to take control of their own learning.

Learner control

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ISSN: 1535-0975

Although it might sound self-explanatory, we still might ask, what does one gain control *over*, after one has established control of one's learning? In other words, what are the unproductive features of pre-network types of learning that can be circumvented thanks to the newly accessible, self-determined learning environment?

The notion of self-directed learning emerged as a central area of research in the 1970's through the 1990's in North American literature, and subsequently receded into reduced visibility. Today however, there is a renewed interest in the concept, in the context of accessibility of knowledge for all. In the interest of continuity, it seems relevant to briefly review the main conceptual developments in research surrounding SDL. In 1967, Allen Tough, a Canadian scholar, published a condensed version of his doctoral dissertation written two years earlier, which found that almost 100% of adults experienced at least one self-directed learning episode in any given year. This publication could be said to have been the launch of the SDL revolution. The same year as Tough was preparing his thesis, however, a survey by Johnstone and Rivera (1965) pointed out that 7.9% of some 1 800 respondents in the U. S had "participated in independent study of any type" (p. 34). The discrepancy is explained by the fact that Tough admitted to have "helped" his respondents to remember learning events ("the interviewer assisted their memory"). Apparently, after being informed of some 26 different "types" of learning projects, respondents answered the question quite differently. It is evident here that the importance of SDL depends to a large extent on the definition one gives to the expression "learning event". In reverse fashion, the notion of "learning event" can be said to have been somewhat re-defined after the emergence of SDL as a viable representation of learning.

SDL as process

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A few years earlier, Cyril Houle (1961) had prepared the set with his notion that not all adult learning presented a similar profile. According to Houle, adults varied in their approach to learning as being either goal-oriented (learning for a subsequent purpose), learning-oriented (deriving pleasure from simple curiosity), activity-oriented (learning as a social activity with others). However, Tough readily admitted that the only learning he considered important was determined by the benefits learners could derive from learning (goal-oriented). This has been pointed out as a weakness of Tough's framework by critics such as Bonham (1992, pp. 48-54). But Tough remained convinced that deliberate learning should remain the central concern.

> *"Man (sic), according to this view, can be active, energetic, free, and aware. He often chooses his goals, direction, and behavior; he is not always pushed and pulled by his environment and by unconscious inner forces".*
>
> Tough, 1979, p. 45

Furthermore, Tough adhered more or less stringently to a linear process of learning that is similar to other types of programmed learning. For example he described the self-directed learning project's "stages" as being:

1. Decide on a learning goal
2. Determine a learning sequence and a learning schedule
3. Secure the physical and financial resources to pursue the learning project
4. Select a suitable place to learn

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ISSN: 1535-0975

5. Select resources and materials

6. Find appropriate resource persons

7. Resolve motivation issues

8. Overcome learning difficulties

9. Minimize self-doubt

10. Set subsequent learning goals at the end of a learning sequence

It is quite evident that Tough establishes a strong parallel between the "process" of SDL and the "process" of learning-as-the-result-of-teaching, such as routinely found in formal or managed learning environments. The traditional notions of learning goal, resources, learning effort and subsequent assessment are more or less transposed from traditional pedagogy to learner-directed projects. A veritable avalanche of writings followed. The literature of that period accounts for self-directed learning episodes among various groups such as physicians (Fox & West, 1983); students (Johnstone et al., 1965); illiterate villagers (Kondani, 1982); gifted children (Okabayashi et al., 1984); inventors (Cavaliere, 1988); the elderly (Curry, 1983); immigrants (Diaz, 1988); children (Eisenman, 1988); fire-fighters (Clark, 1988); aviators (Torbert, 1988). SDL projects were described in any imaginable context involving nurses, administrators, priests, jazz musicians, etc. All of these studies used a framework similar to the one proposed by Tough, namely that self-directed learning is a *process* that can be accurately described and analyzed over time as a *sequential* series of events.

SDL as personality

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During that same period, Lucy Guglielmino (1977) was working on a model of individuals' "measurable" propensity towards self-direction in learning. After conducting a Delphi study among experts in the field (including the likes of Allen Tough, Cyril Houle and Malcolm Knowles), Guglielmino arrived at a series of characteristics that defined the self-directed learner. By emphasising the *individual* learner rather than the learning *project*, she derived a multi-dimensional model that could be assessed through the Self-directed learning Readiness Scale (SDLRS). That instrument became the standard for a large number of studies. In 1989, Cesljarevic had already counted 47 major reports that used the SDLRS as their central instrument, and in 1990, Guglielmino herself estimated that the instrument had been used among 4596 subjects. In order to better understand learners, the SDLRS was used to establish correlations between readiness for self-direction and numerous other variables. For instance, Sabbaghian (1979) established a positive correlation between SDL and self-perception. Torrance and Mourad (1978) found that self-directed learners have a marked propensity for "right-hemisphere" tasks, such as creativity, analogy, and problem solving. Overall, according to Guglielmino's view, not all persons exhibit the same predisposition for self-direction in learning, just as they differ in other psychological abilities such as creativity, problem-resolution, mathematical reasoning, etc. We could readily say that in this perspective, *all* persons are self-directed learners, although to varying degrees. The plausible corollary here is that self-directed learners are self-directed *because* of their specific personality characteristics.

This view did not persist without meeting with some controversy. For instance, Field (1989) argued rather convincingly that the SDLRS was semantically and statistically based on constructs that differed from self-direction in learning (i.e. that it actually measured disposition towards learning in general, not self-direction in particular). The American

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periodical, Adult Education Quarterly, became the theatre of fierce and passionate debate. Huey Long (Guglielmino's academic advisor at U. Georgia) accused Field's study "nit-picking" while Guglielmino herself argued that Field's study was "replete with errors" and McCune insisted that the Field study was based on "inadequate observations" (in Bonham, 1991). Finally, it appears that Bonham (1991) got the last word when by finally objecting to the vagueness of the concept, self-direction, in Guglielmino's work. Nevertheless, the SDLRS is still being used today by researchers in adult education, and the notion of self-direction as a personality trait is still very much alive. For some reviews of empirical results using the SDLRS and other instruments, see Salazar et al. (2012); Delahaye et al. (2000); and McCune (1988).

SDL as environment

It was George Spear and Donald Mocker (1984) who introduced the notion of SDL as an environmentally-determined phenomenon. While Tough and Guglielmino had both independently confirmed that self-directed learners have the will and capacity for carrying out personal learning projects, Spear and Mocker pointed out that this was often not the case at all. Their research revealed that learners were influenced by their surrounding circumstances much more than by their "determination" or their "inner predisposition". Indeed, respondents to Spear and Mocker's research declared that they had not planned any specific tasks or sequence in their learning:

> *"Self-directed learners, rather than pre-planning their learning projects, tend to select a course from limited alternatives which occur fortuitously in their environment."*
>
> Spear & Mocker, 1984, p. 4

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In this light, the 10 learning tasks imagined by Tough appear to be foreign to the self-directed learning projects at least when they are described by the learners themselves. Noting that in general, authors suppose that all learning projects involve a series of indispensable steps, but that learners themselves do not seem to be aware of these steps, Spear and Mocker shed some doubt on the linear character that theorists would impose on all types of learning, and particularly self-directed learning. The authors cite Kurt Lewin's "field theory" to explain how environmental factors can influence self-directed learning episodes. Tough himself had admitted that the learning "steps" could remain outside the awareness of learners, but Spear and Mocker argue, on the contrary, that such a linear learning process can only occur within the confines of formal learning situations. Indeed, planned learning supposes that the learner already has some mastery of the contents to be learned. Furthermore, the task of planning a learning sequence is a rather specialized task for which a learner in the natural setting is not likely to be prepared. Spear and Mocker concluded that it is not reasonable to assume that self-directed learning projects can be planned in a similar way as formal learning projects.

Personal commitment to learn

As we can see, the notion of learner-control has been the object of some discussion in the literature, and has generally implied the possibility for individuals to exercise choices, beginning of course with the choice of whether to learn anything at all in the first place (Chu & Tsai, 2009; Long, 1993; Candy, 1991). This is best understood as the opposite of some forms of "other-directed" learning such as mandatory schooling, or of some instances of workplace learning, where people have no choice at all about whether to learn, or indeed what to learn. So, the first area where learners may exercise control over their learning (or be

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inhibited from doing so) lies in their option to initiate and pursue learning, or to choose to do something else instead.

The personal commitment to learning precedes other aspects of the knowledge building process and is contingent on psychological and contextual variables such as readiness and incentive. This has been called the "conative" dimension of learner control (Ponton et al., 2005; Bouchard, 2009; Kop & Bouchard, 2011). However, even a cursory incursion into the notion of needs assessment reveals that this important step cannot be left entirely to chance, and that some measure of sophistication must be applied in order to differentiate, for instance, between "perceived" learning needs and "prescribed" needs - neither type being in itself sufficient to mandate enlightened choices - or between levels of behavioural, cognitive or attitudinal gains that are to be expected as outcomes of the learning process. Even in a "goal-free" learning environment such as advocated by Zheng (2010), it is still advisable for any self-regulated learning mechanism to remain embedded in the contingencies of real life and to include the periodic monitoring of one's progression as it relates to more holistic, non-learning aspects of individual development. The decision to learn should belong, before and above all else, to the learner. If it does not liberate us from the 'obligation' to learn, then the notion of PLE implicitly reinforces the hegemonic view of humans as permanent, *de facto* learners-in-deficit. This notion has been used to describe unreasonable expectations, for example by employers, that their workers be permanently engaged in a catch-up race with new and emerging knowledge.

The second area of possible learner-control lies in the ability to influence the procedures or ‘algorithms’ of the learning process itself (Kop & Bouchard, 2011). The learning process is the result of many decisions and choices, whether they are exercised by a

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teacher in a traditional classroom, or by a learner in a self-directed environment. Not only are we required to decide *whether* to learn, and *what* to learn, we must also determine *how* the learning can unfold. Some examples of algorithmic choices that must be made include determining the pace of learning (how fast), the sequence of learning events (in what order), the goal structure, the nature and frequency of the follow-up, the overall validation process, etc. But perhaps the most important of these procedural decisions is choosing the materials that will be used for the purpose of building knowledge. Instructors and content designers normally consider this a central aspect of their job, for it is their responsibility as experts to direct students to the most appropriate text, medium or person while implicitly circumventing second-rate sources and outright charlatans. Interestingly, and central to our discussion of PLE's and learner autonomy, selection of resources is also the area where learners in programmed environments typically exercise the *least* control over their learning. This aspect of learner-control is surely the one where web-based learning is likely to make the largest difference, since it provides the possibility for learners to directly access a quasi-infinite range of learning resources, including knowledgeable others. Learners are no longer dependent on institutional authorities to direct them to appropriate materials and persons, and they can search for up-to-date information on the web, as well as interact with other learners and specialists who volunteer their expertise on the network. This is truly a revolutionary aspect of web-based PLE's and the one that offers the greatest promise for an Illichian 'liberation' communities of learners. However, since the problem of monitoring the quality and relevance of resources can now occur in the absence of a content expert, this means that the learner is now in charge of this complex task. And this predicament is exacerbated by the very nature of the web, beginning with the quantum explosion in the number of accessible sources that it makes accessible.

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A web of … deception?

Very early in the development of the world-wide web, critics have warned against the unreliability of information that is not subjected to the habitual processes of validation. There is still much talk about the 'Babel' of information overload on the web (Castells, 2011; Benkler, 2007), and there are lingering qualms that the spontaneous assault on the public sphere by the multitude can only lead to the dilution of defined standards of 'quality' - not to mention in more extreme cases, to suspicions of conspiracy:

> *"... these excesses (overabundance of information, etc.) produce a flattening of distinctions between authorized and unauthorized, official and covert, expert and amateur, true and false that seems to threaten reason, democracy, and the bounded stability of the nation."*
>
> Dean, 2000, p. 63

The fears expressed against the democratization of the web are reminiscent of the tensions between mass culture and so-called 'high' culture that emerged in tandem with technologies such as the newspaper, television and the radio, and which prompted one author in the 1950's to cynically observe that, "mass culture is very, very democratic: it absolutely refuses to discriminate against, or between, anything or anybody" (MacDonald, 1957, in Strinati, 2004, p.14). Today, the limitation of the Web as an unfiltered information source cannot be shrugged off with mere caginess. One co-designer of the application Twitter, Evan Williams, readily admits that "We must absolutely find a way to reduce noise-to-signal ratio on the web", while analyst Danah Boyd, addressing the interactive web's potential for disinformation, asserts that, "We should take care to create a future that we actually want to live in" (Boyd, 2010).

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The problem of ambiguous reliability is compounded by two specific properties of networks. First, the so-called 'Power Law' explains that the popularity (or visibility) of a URL depends basically on the number of links previously directed to it by others, regardless of its own inherent value. This mathematical occurrence knows no moral or scientific justification, and research confirms that people tend to prefer content that is popular among friends and contacts above all other criteria of credibility or quality (Pegrum, 2011; British Library, 2008; Goodfellow and Lea, 2007). This has raised concerns that some kind of 'herd mentality' is becoming the main determinant of hierarchy on the network. Without directly arguing that there is no merit in word-of-mouth popularization, we should at least take stock of the fact that other, more credible alternatives often take second place in social network environments, to the point that they matter very little or not at all. So, we must at the very least ask: is peer judgment a feature of an 'ideal' learning environment? And this is without mentioning 'non-peers' dislocated from the network, rendered invisible for their non-networkedness. What about them?

The second characteristic that can devalue network content is the propagation of customized search and filtering algorithms that inspired Shirky (2010) to talk of the 'death of ontology'. Traditionally, researchers, scholars and students have depended on classification structures such as the Dewey decimal system or the Library of Congress cataloguing scheme that arrange subjects according to what they *are*, or more precisely, according to meanings assigned by those systems themselves. Over time, these methods have proven invaluable to locate sources in the physically defined spaces of library stacks. In the non-physically delineated environment of the web, similar divisions have been found too restrictive because they don't allow what the web does best: to link together objects and persons that are related to each other idiosyncratically, rather than ontologically. In the network, it is not considered

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helpful to impose an 'outside' logic to classification, so like in all things networked, the solution lies in spontaneous generation. The result has been to capitalize on individuals' capacity to generate their own webs of links, using their own personal logic.

While some might say that unlimited links attached to unlimited content provide a flexible and intuitive way to associate ideas, it could also be argued that such a non-structure creates a vacuum which can (and will) be filled with market-generated systems that depend on criteria of their own, sometimes with contrary results. For example 'tagging' one's public content allows the gregarious assembly of similar-minded taggers. Replacing taxonomy with 'folksonomy' seems innocuous enough and can probably be acclaimed as one of those so-called 'liberating' developments in web ontology. On the other hand, some practices are much less ingenuous in their purpose, such as the fast-growing industry of assigning consumer characteristics to individual users in order to 'personalize' their search results. There is evidence of a disturbing tendency among knowledge brokers to allocate specific algorithms to specific information depending on 'who is asking'. Most well-known search engine designers readily admit that personalizing searches is one of their development priorities (Google News, 2008). In a somewhat frightful way, the difficult question of establishing relationships between things according to their 'nature' is subjected to laws of commerce even before entering the world of ideas. Again we should ask, is this an ideal feature of a learning environment?

The corollary to profiling our web searches according to our inquiry patterns is to do the opposite, i. e. to assume that everybody is searching for the same thing, regardless of goal or purpose. To illustrate this, this author once tried to reproduce a biographical search that a student did about a well-known educational theorist, but which in my opinion still lacked

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some essential information. Doing my own web search, I managed to come up with about the same information as the student, which stated publications and things like 'Dr. *X* is professor of adult education at University "*Y*", etc., but I was never able to ascertain what I already knew as a fact: this man had died more than 12 years earlier. So, we might ask: How is important information found, but essential data concealed? In the words of Sunstein (2006),

> *"Why is Google so good at finding what a particular researcher wants? The answer is that it knows what most researchers want, and most people want what most people want."*
>
> Sunstein, 2006, p. 23

The uneasy commons

In the end, and heedless to these cautionary observations, the web is destined to grow and the problem of searching it will not become any simpler (Selwyn, 2010). Ironically, we have rapidly come to a point where 'too much choice' is an impediment to learning, just like 'not-enough choice' used to be. One solution to the over-abundance of available information lies in the creation of web 'filters' that will only allow desirable information to seep into our environment. Filters vary in nature and effectiveness from sophisticated search protocols to self-proclaimed bloggers who make decisions for us about the flow of information that will ultimately reach our screen. Of course, given the monumental task of filtering the web, we will inevitably need to filter even the filters themselves in order to aggregate a manageable mass of data. The problem is, whom will we entrust our filtering to? Information filtering is reminiscent of traditional reviews of literature or annotated bibliographies that are rooted in the academic tradition, where a knowledgeable reader highlights the main points of a complex issue, thereby saving us the effort of sifting through all the materials ourselves. In

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fact, a vast amount of 'aggregated' knowledge distributed on the web is quoted from the works of professional academics, philosophers, sociologists and researchers whose credibility is recognized through traditional, pre-internet kinds of filters – back when the cost of publishing was a safeguard against the threat of infinite garbage. In a cyberworld filled with dubious claims to accuracy, proven intellectuals are manifestly still considered good arbiters for separating the believable from the bogus.

Interestingly enough however, a majority of professional academics are prevented from contributing freely to today's flowing exchanges on the web because an important part of their work is housed in proprietary databases. This is in direct opposition to the network trend of the 'creative commons' where participants are invited to contribute their work liberally without other compensation than heightened reputation or popularity. Indeed, there is growing confidence in the literature that not-for-profit contributions to networked knowledge represent an irreversible trend that will soon become a serious alternative to commercially protected content (for an in-depth discussion of this issue, see Benkler, 2007). The optimistic prediction that the networked commons will eventually counterbalance proprietary interests has been explained in at least three ways. First, because the network deals with digital materials that can be reproduced infinitely at no cost, there seems to be no point in 'imposing artificial scarcity' on them in the first place (Mejias, 2009, p.7). Second, there is a perception that an inherent set of human 'motivations' such as vanity and altruism will continue to inspire people to contribute freely to networks (Shirky, 2008). And third, that there are sufficient secondary economic spin-offs to be derived from web notoriety to ensure a continued supply from web contributors. Some even predict that these ‘non-economic’ motives of contributing to open source content represent an irreversible trend.

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> *"As the material barriers that ultimately drove much of our information environment to be funneled through the proprietary, market-based strategies are removed, these basic nonmarket, non proprietary, motivations and organizational forms should in principle become even more important to the information production system."*
>
> Benkler, 2007, p. 16

The reality however is that the jury is still out over who will win the tug-of-war for network accessibility. On the one hand, authors such as Benkler tell a story of exciting open-source economics unleashed by the new connectivity; on the other hand, Lanier (2010) warns against the proliferation of non-proprietary commodities, arguing that the checks and balances of the for-profit market (as opposed to open-source kinds of markets) are necessary in order to weed out irrelevant contributions to discourse and structure. The argument is once again, ownership versus credibility. While we sit and talk about the promises of open-source access and quietly anticipate the empowerment of the information commons, governments and global corporations are negotiating worldwide agreements designed, precisely, to thwart the expansion of access through connectivity. In her book, *Who owns academic work?,* intellectual-property lawyer Corrine McSherry (2001) summarizes the nature of the crisis brought about by the 'liberation' of knowledge and creativity in interactive networks:

> *"When documents can be copied and circulated worldwide with a few clicks of a mouse, and multiple forms of media (textual, visual, musical) can be digitized and recombined so that all traces of "originary" sources are practically dissolved, it is generally difficult to ensure that persons (both corporate and "natural") are compensated in their investments. Hence the development of*

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> *legislation, legal doctrines and technologies designed to track and limit the circulation of digitized information and thereby to contain the "crisis"*
>
> McSherry, 2001, p. 26

Obviously, a purely commons-bound PLE is not feasible at this time, at least if it is to include access to academic writing, among other things. The struggle for control over what is and is not accessible to the commons shows no sign of slowing down in the near future. Currently, all eyes are turned to the future digitalization of existing books as it becomes evident that technology allows the storage of data in large enough quantities to imagine that all books ever written could be housed in a single database. The question is, who will 'own' and 'distribute' this data? By applying market logic to digital phenomena, we are accepting the possibility of handing over a very large chunk of our culture to some overarching corporate entities, and then buying it back from them for use in our Personal Learning Environments. Even without thinking about issues of possible corruption of access or censorship, this does not make good economic sense.

Network snake oil

Networks have changed our way of thinking about many things, from the workings of the globalized economy to the mathematics of human relations. Network theory is a trendy thing and it fills us with fascination at every turn. As would be expected, the world of education has been no exception and some authors have been tempted to revisit basic notions such as the nature of learning, and the nature of knowledge itself in light of recent network developments. The results are not without appeal and we can predict that after the dust settles, network learning theories will at least contribute a substantial footnote to tomorrow's textbooks. The danger however with force-matching psychological and epistemological

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explanations to fashionable network theory is that people might be misled to believe some things about learning networks and Personal Learning Environments that they simply cannot deliver. For instance, in network-based learning theory, there is a marked tendency to 'discover' futuristic learner characteristics that are either already explained by previous learning theories, or that are contrary to rational sense. Consider for example the connectivist contention that because of its networked genesis, conceptualisation can no longer be seen as the acquisition of a localized mental representation, but rather as a fluid and changing association:

> *"(...) the concept 'Paris' is a loose association of a whole bunch of different things, and hence the concept 'Paris' exists in no particular place in our minds, but rather, is scattered throughout our minds."*
>
> Downes, 2010, p. 4

and further,

> "*(...) each person is experiencing a mental state that is at best seen as an approximation of what it is that is being said in words or experienced in nature."*
>
> Downes, 2010, p. 9

Beyond its clear departure from medieval phrenology (the study of cranial bumps), the scatter-mind model seems to be another way of saying that concrete concepts cannot be reduced to a set of defining features (e.g. a dog has a tail and four legs), but are more usefully described as the formation of tentative "prototypes" (e.g. a dog with three legs is still a dog) which people shape and re-shape constantly, sometimes as the result of human interaction and

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sometimes not. Such theories of concept formation have been around for many years, alternatively called 'prototype' or 'parallel-distributed' learning theories (Ormrod, 2008 or any standard textbook). Perhaps the novelty here resides in the fact that complex mental representations can now be referred to as 'networks' of mental activity, in the same way that the web itself has been compared to the human brain, as they are both examples of 'networks'. The isomorphic transposition of properties from one instance of network (e.g. the web) to another (the brain), replays a familiar occurrence in technological innovation – from the invention of the telegraph to the spread of personal computers – where new technologies have been the subliminal background for 'explaining' how the human mind works (Friesen, 2009). One day, we are wired as 2-way feedback loops, and the next our thoughts are portrayed as tentacular, self-replicating rhizomes. Here the question is, did the telegraph actually *make* us into unthinking behavioral machines? And will social computing *make* us into connected thinkers in a heretofore undiscovered way?

So this question remains, at least for the sake of a final argument on the issue: does networked learning facilitate in any way my ability to conceptualize abstract material in a more flexible, socially responsive manner, or is this ability a function of cognitive processes entirely unrelated to the particulars of my current learning (networked) 'environment'? Developmental psychologists in the past have opted for the second explanation. They have argued that all individuals undergo a series of 'epistemic shifts' as a result of normal cognitive development, and that the later stages of cognitive maturity are characterized by the ability to hold concepts that are fluid and changing, rather than fixed and rigid (Perry, 1970; Baxter-Magolda, 1992). In this light, to ascribe determinants of human cognitive development to some aspect of virtual connectivity is somewhat misleading.

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If the network allows us to question the nature of learning, so it appears also to redefine the nature of knowing. Web theorists have hinted at a possible epistemological shift towards some unknown type of 'networked knowledge' (Siemens, 2008; 2006). The main feature of this 'way of knowing' again seems to be based on the fluid and changing nature of connected reality, simply by virtue of its being shared and inevitably confronted with the alternate views of others. Hence, knowledge is continually being re-shaped in the network:

> *"(...) the world of expert, clearly-defined, and well-organized knowledge formed by ancient philosophers and deciphered by subsequent thinkers, has today given way to continual flux."*
>
> Siemens, 2008, p. 5

Furthermore, this seemingly harmless observation has led some to believe that knowledge *is* the network:

> *"(... knowledge) consists of a network of connections formed from experience and interactions with a knowing community."*
>
> Downes, 2010, p. 1

The rise of the networked age has triggered a torrent of ideas about the features of information networks, such as: the opportunities of quasi-infinite connectivity; the 'natural' organizing principles of networks; the explosion of cost-free production and reproduction; the growing market for non-proprietary services and products; the relativization of meaning in an 'economy of attention' (Lanham, 2006; Shirky, 2010). We are witnessing a somewhat frenzied effort to characterize just about anything with the newfound properties of networks - be they mathematical, economic, social or psychological. The movement is so entrenched in our

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times that it was no surprise to hear in the popular movie Avatar (2010) a bemused and glassy-eyed Sigourney Weaver affirm: "... But don't you get it? This whole planet is a... *network*". The tendency is reminiscent of the 'theory of general systems' initiated by Von Bertalanffy (1969) which briefly became the pet premise of the 'systems thinking' movement, but which quickly fizzed out when, in the words of Bertalanffy himself, "disappointment of over-extended expectations occurred" (p. 23). Of course we can look at web connectivity as a quantum leap from previous forms of communication in its capacity to enable more connections, faster. But the fixation of explaining too many things in terms of network theory does a disservice to learners and to potential users of designed PLE's, simply because it couches the issues of access to learning in arcane and incorrect reasoning.

Conclusion

Network connectivity has given us a world of intricate, rapid re-articulations of information and meaning, while at the same time providing us with the technical means to actually keep up with it. By considering the network as part of our learning environment, we realize that the so-called unlimited access to knowledge is really a backdrop for human *purpose* and that it is only through the careful realization of that purpose that we can create something of value. There is nothing inherently deterministic in linking a quasi-infinite number of nodes within an unmonitored network where anything can happen, and indeed it does. Connectivity not only implies the possibility of access, it also changes the nature of our relations with ideas and persons. We are confronted with questions about what it means to learn and to know, in ways that are not merely hypothetical or subject to theoretical speculation, but in ways that are very real to each of us, personally.

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Scientists and thinkers in all domains have been challenged to explain the emergent relationships uncovered by connectivity. They made us question some notions that we had considered more or less self-evident in our previous, less complicated culture. But the fact is, there are no extraneous explanations for learning and knowing that are disconnected from our own, intimate selves. In the end, each of us is responsible for defining what is real, what is true, what makes sense. This is a rather profound realization that networked learning makes not only possible, but also necessary – or more precisely, unavoidable.

The intention in pointing out some contradictions and inconsistencies in network related theories is not to discredit the efforts of those who have sought light in this tunnel. Rather, it is to reinforce the notion of the epistemic self seeking equilibrium in a complex world of interconnected realities. Networked connectivity does not automatically make up new ways of learning, anymore than it automatically reveals new ways of knowing. What it does however is to force us as learners and knowledge seekers to ask what it is that we are looking for, and why. These two fundamental questions – the meaning of learning and the purpose of knowing – have been the focus of much serious effort from scholars and intellectuals throughout human history. The problem we face today is that it is no longer possible to engage in a learning journey without being required to make some judgements about these questions for ourselves. In his book *Fear of Knowledge*, Boghossian (2007) reminds us that there are different ways to test the validity of so-called 'true' statements and that the methods used can vary considerably in reliability and consistency. In an open environment such as the web, learners are required to make such estimates on a regular basis, and therefore are called upon to exercise some rather sophisticated judgement calls. The problem is

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compounded if we consider that such judgements of validity are destined to remain forever tentative if they are to be epistemologically acceptable. According to standard texts in the philosophy of science (e.g. Cover & Curd, 1998), there is a necessary string of inference to be followed from testing the validity of an assertion to demonstrating its 'falisifiability'. This basic epistemological 'fact' requires explanations too complex to be included here, which is precisely why the question is so urgent: How can learners be prepared to make such strings of inference, and make them accurately?

The exercise of learner-control requires an understanding of the processes and outcomes of the learning cycle, along with a well-articulated view of one's own expectations in knowledge-building and connectivity. In complex networked learning environments, we must devise ways to reduce our vulnerability as learners and to build our capacity to use a wide range of communicative tools. In this way, we may develop the capacity for creative interaction that is necessary for structuring a new understanding of the world.

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References

Baxter-Magolda, M. B. (1992). *Knowing and reasoning in college: Gender-related patterns in students' intellectual development*. San Francisco: Jossey Bass.

Benkler, Y. (2007). *The Wealth of networks: How social production transforms markets and freedoms.* Yale University Press.

Bertalanffy, L. V. (1969). *General systems theory: Foundations, development, applications*. New York: G. Braziller.

Boghossian, P. (2007). *Fear of Knowledge: Against Relativism and Constructivism.* Oxford: Clarendon Press.

Bouchard, P. (2009). *Some factors to consider when Designing Semi-autonomous Learning Environments.* European Journal of e-learning, Volume 7, (2), 93-100.

Boyd, D. (2010). Speech to the South by Southwest - SxSW - conference in Austin Texas, March 2010.

British Library and JISC (2008). *Information behaviour of the researcher of the future*. 11 January 2008. Retrieved from: www.ucl.ac.uk/slais/research/ciber/downloads

Candy, P. (1991). *Self-direction in learning: A comprehensive guide to theory and practice.* San Francisco: Jossey Bass.

Castells, M. (2011). *Communication power*. Oxford: Oxford University Press.

Cavaliere, L. A. (1988). *A case study of the self-directed learning processes and network patterns utilized by the Wright brothers.* Rutgers, N. J.: Dissertation Abstracts International, 2894-a.

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ISSN: 1535-0975

Cesljarevic, O. (1989). *Étude des liens entre les scores au SDLRS et le rendement académique d'adultes à L'Université Simon-Rodriguez (Vénézuela).* Doctoral project presented to the School of Graduate Studies, Université de Montréal.

Chu, R. J.-C., & Tsai, C.-C. (2009). Self-directed learning readiness, Internet self-efficacy and preferences towards constructivist Internet-based learning environments among higher-aged adults. *Journal of Computer Assisted Learning*, *25*(5), 489-501.

Clark, B. A. (1989). *Comparison of self-directed learning readiness of five executives to the norm and public managers*. ERIC document ED327667.

Cover, J. A. & Curd, M (1998). *Philosophy of science: The central issues*. New York: Norton.

Curry, M. A. (1983). *The analysis of self-directed learning readiness characteristics in older adults engaged in formal learning activities in two settings.* Unpublished doctoral dissertation, Kansas State University.

Dean, J. (2000). "Webs of conspiracy", in A. Herman and T. Swiss (eds.), The World-wide web and contemporary cultural conspiracy. New York: Routeledge, 61-76.

Delahaye , B., & Choy, S. (2000). "The Learning Preference Assessment (Self-Directed Learning Readiness Scale)". In Maltby, J., Lewis, C. A., & Hill, A. (2000). Commissioned reviews of 250 psychological tests. Edwin Mellen Press, Wales, U.K.

Diaz, P. C. (1988). Life satisfaction and learner self-direction as related to ethnicity and the older adult. Ohio State University, unpublished doctoral dissertation. Dissertation Abstracts International, 51-a.

Downes, S. (2010). *Learning networks and connective knowledge*, in H. Hao Yang and S. Chi-Yin Yuen (eds.) "Collective intelligence and E-Learning 2.0: Implications of web-based communities and networking". Hershey PA: IGI Global, 1-26.

Eisenman, J. (1989). *Self-directed learning: A correlational study of fifth grade students, their arents and teachers. University of Georgia, unpublished doctoral dissertation.*

Field, L. (1989).*An investigation into the structure, validity and reliability of Guglielmino's SDLRS.* Adult Education Quarterly, 39 (3), 125-139.

Fox, R. & West, R. (1983). *Personality traits and perceived benefits associated with different approaches of medical students to self-directed learnig projects.* Paper presented at the Adult Education Research Conference (AERC). Montreal.

Friesen, N. (2009). Re-thinking E-learning research: Foundations, methods, and practice. New York: Peter Lang.

Goodfellow, R. and Lea, M. (2007). *Challenging e-learning in the university: A literacies perspective*. Maidenhead: Society for Research into Higher Education and Open University Press.

Google News (2008). Is Google perfect? Not always. Here are 10 flops. http://www.seroundtable.com/archives/017202.html

Guglielmino, L. M. (1977). *Development of the self-direted readiness learning scale.* Unpublished doctoral dissertation, University of Georgia.

Houle, C. O. (1961). *The Inquiring mind.* Madison: The University of Wisconsin Press.

Illich, I. (1971). *Deschooling society.* Reprinted in 1978 by Marion Boyars, London.

Johnstone, J. W. C. & Rivera, R. J. (1965). *Volunteers for learning: A study of educational pursuits of American adults*. Chicago: Aldine Publications.

Kondani, K. (1982). *Analyse de projets autodidactiques d'adultes analphabètes de Kinshasa.* Unpublished doctoral disssertation, Université de Montréal, Faculté des Sciences de l'Éducation.

Kop, R., & Bouchard, P. (2011). The role of adult educators in networked learning environments. In M. Thomas (Ed.), *Digital education : opportunities for social collaboration* (1st ed.). New York: Palgrave Macmillan.

Lanham, R. A. (2006). *The economics of attention: Style and substance in the age of information*. The University of Chicago Press.

Lanier, J. (2010). *You are not a gadget : A manifesto.* New York: Random House.

Long, H. B. (1993). *Emerging perspectives of self-directed learning*. Research Center for Professional and Continuing Education: University of Oklahoma.

McSherry, C. (2001). *Who Owns Academic Work? Battling for Control of Intellectual Property.* Harvard University Press.

McCune, S. K. (1988). *A meta-analytic study of adult self direction in learning: A review of the research from 1977 to 1987* (Doctoral dissertation, Texas A&M University, 1988). Dissertation Abstracts International, 49, 3237.

Mejias, U. (2009). *Peerless: The ethics of P2P network disassembly.* Presented at the 4th Inclusiva-net meeting: P2P Networks and Processes. Madrid, Spain.

Okayabashi, H. & Torrance, E. P. (1984). *Role of style of learning and thinking and self-directed learning readiness in the achievement of gifted children.* Journal of learning disabilities, 17 (2).

Ormrod, J. E. (2008). *Human Learning*. Upper Saddle River, N. J.: Pearson/Merrill Prentice Hall.

Pegrum, M. (2011). Modified, multipied and remixed: Social media and digital literacies. In M. Thomas (Ed.), *Digital education : opportunities for social collaboration* (1st ed.). New York: Palgrave Macmillan.

Perry, W. G. (1970). *Forms of intellectual and ethical development in the college years*. New York: Holt, Reinhart & Winston.

Ponton, M., Derrick, G., Hall, M., Rhea, N. and Carr, P. (2005). *The Relationship Between Self-Efficacy and Autonomous Learning: The Development of New Instrumentation*. The International Journal of Self-Directed Learning, 2 (1).

Rousseau, J.-J. (1762: 1972). *Émile.* London: Aldine House.

Sabbaghian, Z. (1979). *Adult self-directedness and self-concept: An exploration of relationship.* Unpublished doctoral dissertation. Iowa State University. ERIC document 8000170.

Selwyn, Neil. (2010). Thew "new" connectivities of digital education. In M. Apple (Ed.), *The Routledge international handbook of the sociology of education*. London, New York: Routledge.

Salazar, T., Piksurcih, J., & Lacy, N. (2012). *The Relationship Between Self-Directed Learning Readiness and Self-Regulation Skills in Entering Medical Students*. Texas Tech Health Sciences Center. Paul L. Foster School of Medicine.

Shirky, C. (2008). *Here comes Everybody*. *The power of organizing without organizations*. New York: The Penguin Press.

Shirky, C. (2010). *Ontology is overrated: Categories, links and tags*. Blogpost retrieved April 6, 2010 from: http://www.shirky.com/writings/ontology_overrated.html

Siemens (2008). *New structures and spaces of learning: The systemic impact of connective knowledge, connectivism, and networked learning.* Paper presented to: Encontro Sobre Web 2.0. Braga, Portugal, October 10, 2008.

Siemens, G. (2006). *Knowing knowledge*. Retrieved from: www.knowingknowledge.com.

Spear, G. E. & Mocker, D. W. (1984). *The organizing circumtance: Environmental determinants in self-directed learning.* Adult Education Quarterly, 35 (1), 1-10.

Strinati, D. (2004). *An introduction to theories of popular culture.* Second edition. London: Routledge.

Sunstein, C. R. (2006). *Infotopia: How many minds produce knowledge*. Oxford University Press.

Torbert, J. B. (1988). *Improving self-directed learning in the Phoenix Air Guard.* ERIC document ED294035.

Torrance, E. P. & Mourad, S. (1978). *Some creativity and style of learning and thinking correlates of Guglielmino' Self-Directed Learning Readiness Scale*. Psychological reports, vol. 43, 1167-1171.

Tough, A. M. (1979) *Choosing to learn.* Toronto: The Ontario Institute for Studies in Education (OISE).

Tough, A. M. (1967). *Learning without a teacher.* Toronto: The Ontario Institute for Studies in Education (OISE).

Tough, A. M. (1965) *The teaching tasks performed by adult self-teachers.* Unpublished doctoral thesis, Chicago University, Ill.

Zheng, R. Z. (2010). *Designing dynamic learning environment for Web 2.0 application*, in H. Hao Yang and S. Chi-Yin Yuen (eds.) *Collective intelligence and E-Learning 2.0: Implications of web-based communities and networking*. Hershey PA: IGI Global, 61-76.