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CONNECTIVISM, A NEW LEARNING THEORY?

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Abstract

Because especially in the last two decades technology has developed new ways of communication, of learning, even of living, this paper, focused on theoretical approache, refers to a relatively new theory of learning, connectivism. It can say that in our knowledge-based society it's a requirement to connect people to the distributed knowledge made in social environment. Social environments trends, the educational life, the new needs of learning, influence the scholars from educational sciences to search new expressions of what is really important now, in the near and distant future, regarding the evolution of learning concepts. The social environments trends are to encompass the IT which lead to new paradigms of learning, among which is the connectivism. In this paper I will try to share with you some ideas about how connectivity can be related with higher education, there where we try to form and develop students' skills (fundamental, personal management and teamwork skills), required on this era by the labor market.

Keywords: Knowledge-based society skills; connectivism; distributed knowledge; nodes; connections; learning networks.

1. Introduction

In a digital age, we are surrounded, indeed, immersed, in technology. Furthermore, the rate of technological change shows no sign of slowing down. Technology is leading to massive changes in the economy, in the way we communicate and relate to each other, and increasingly in the way we learn. Yet our educational institutions were largely built for another age, based on an industrial rather than a digital era. In the era of almost total connectivity, of an acquisitive social media, universities must find ways of learning more permeable and fluid paths toward open source content and student-centered learning experiences comment Kamenetz (2010, p. 130).

Thus educational institutions and educators (teachers, professors) are faced with a massive challenge of change. How can they ensure that through the study programs and courses for the current

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students, the skills needed in the knowledge-based society that are fit for an increasingly volatile, uncertain, complex and ambiguous future are developed? What kinds of skills are needed in the digital age?

For entering, stay in and progress in the world of work (and probably into the future world of jobs), the skills needed into knowledge-based society after the Conference Board of Canada (2016) for example, are the following: a) *Fundamental skills*. A youngster will be better prepared to progress in the world of work when he/she can: communicate, manage information, use numbers, think and solve problems. b) *Personal management skills*, *attitudes, and behaviours that drive one's potential for growth* of the learners are: demonstrate positive attitudes and behaviours, be responsible, be adaptable, learn continuously, work safely. c) *Teamwork skills* required to an educable are: work with others, participate in projects and tasks. On the other hand, OECD (2016) shows that using both *cognitive* (literacy, numeracy) and *"soft"* (communicating, influencing, negotiating) *skills* in the workplace and maintaining them over a lifetime is strongly related to greater skills proficiency, formed and developed in initial training, which, in turn, are related to economic and social well-being.

The focus on the skills needed in a digital age raises questions about the purpose of universities in particular, but also of educational system in general. They must focus on accuracy of knowledge but mostly on the skills required for a knowledge-based society (often referred to as 21st century skills) that reinforces the kind of learning, especially the development of intellectual skills for which, universities have taken great pride in the past, but now they must take into consideration another kind of learning which connects learners not only face-to-face but also by information technology. This kind of learning can be connectivism learning.

2. Basic Theoretical Foundation of The Connectivism in Literature

If we consider what the curriculum theory propose and postulate that the way of learning process is more important than the assimilation of content, it is obvious that learning to learn what is necessary today for tomorrow is the real challenge for any learning theory. To know how to know and apply those known in real life with a positive attitude is a desiderate of any learning theory, even for new one like connectivism.

After the founder's explanations, George Siemens, connectivism pave the way for a new model of learning, adequate to knowledge society, in which "learning is a process of connecting specialized nodes or information sources" (Siemens, 2004, – Principles of connectivism) because the Internet made a huge shift into the understanding of the knowledge nature.

Siemens coined the term „connectivism" to describe learning networks and according to the new learning paradigm, „knowledge is created beyond the level of individual human participants, and is constantly shifting and changing. Knowledge in networks is not controlled or created by any formal organization, although organizations can and should „plug in" to this world of constant information flow, and draw meaning from it." (Bates, 2015, p.56)

Connectivism, as a learning theory, has its origins in distributed learning (Siemens, 2004), being relevant to digital society, in the opinion of proponents, and holds another epistemological position compare to Driscoll's classification (2005): objectivism (linked to behaviourism as learning theory),

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pragmatism (linked to cognitivism) and interpretivism (linked to constructivism), and in the end of the current scheme enshrined evolution of learning theories (see the figure below)!

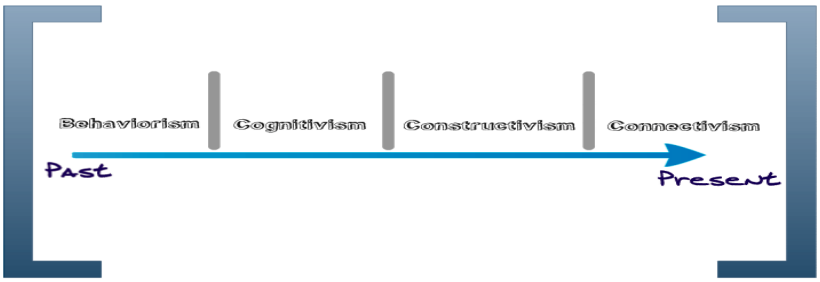

Figure 1. Evolution of learning theories

Connectivism, after another supporter of this theory, "is the thesis that knowledge is distributed across a network of connections, into its nodes, and therefore, learning consists of the ability to construct and traverse those nodes connected into networks" (Downes, 2012, p. 9).

As we know, into a network, there are a lot of connections, links between entities, entities which can be named nodes and each node has or has to have information as forms of knowledge. A node could be any entity such as: a person, a group of people, a computer or ideas and communities. A change of data in a node makes data's change in another node. Being connected into a network, the nodes play their role in sharing the information which can be transformed, by understanding, in true knowledge.

Deep connections are representations of knowledge and understandings. In connectivism learning is actionable knowledge. Learners exploit the weak ties between nodes, recognize the patterns, connect to the small world of individual knowledge (meaning making) and extend personal network. Therefore as Siemens and Downes show, connectivism assumes knowledge sharing between nodes of knowledge, which are individuals or organisations with some expertise in a particular field, which can induce learning.

Learners cannot not learn, they learn in every interaction that they have with the network, with the world. Hence, "the activities that learners undertake when they conduct practices, in order to learn, are like developing or growing their selves, together with the society, in certain (connected) ways."(Downes, 2007, paragraph six)

For this reason, Downes says it takes a different approach from education sciences of the phenomenon of learning by acceptance of the connectivism which "(a) seeks to describe „successful" networks (as identified by their properties, which I have characterized as diversity, autonomy, openness, and connectivity) and (b) seeks to describe the practices that lead to such networks, both in the individual and in society (which I have characterized as modeling and demonstration (on the part of a teacher) and practice and reflection (on the part of a learner)" (Downes, 2012, p. 85)

Downes (2012) took to characterizing connectivism from three perspectives: knowledge, learning and community. He noted that „These three are intended to be represented as a cycle. Knowledge informs learning; what we learn informs community; and the community in turn creates knowledge. And the reverse: knowledge builds community, while community defines what is learned, and what is learned becomes knowledge. The three are aspects of what is essentially the same phenomenon, representations

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of communications and structures that are created by individuals interacting and exchanging experiences. Each of these represents an aspect of network theory: the first, examining the cognitive properties of networks, the second, looking at how networks learn, and the third, tracing the properties of effective networks. These also represent the processes of learning, inference and discovery in society writ large." (Downes, 2012, p.15)

Returning to Siemens and his assumption concerning connectivism learning theory, he identifies the following principles of it:

„• Learning and knowledge rests in diversity of opinions.

• Learning is a process of connecting specialized nodes or information sources.

• Learning may reside in non-human appliances.

• Capacity to know more is more critical than what is currently known.

• Nurturing and maintaining connections is needed to facilitate continual learning.

• Ability to see connections between fields, ideas, and concepts is a core skill.

• Currency (accurate, up-to-date knowledge) is the intent of all connectivist learning activities.

• Decision-making is itself a learning process. Choosing what to learn and the meaning of incoming information is seen through the lens of a shifting reality. While there is a right answer now, it may be wrong tomorrow due to alterations in the information climate affecting the decision." (Siemens, 2004, – Principles of connectivism)

A connectivist understanding of educational systems of the future was explored and shown by Siemens, Downes and Cormier when they constructed the first massive open online course (MOOC), partly to explain and partly to model a connectivist approach to learning. They supposed that MOOC course will help participants make sense of the transformative impact of technology in teaching and learning and that is a good example of the application of connectivism. MOOC (massive – networks grow; open – networks have no edges; online – creates the first teal networks for learning; course – creating temporary networks) involving instructor, library and others, presumes in short: a course, an event, an open action, an interactive activity, a distributed learning and lifelong networked learning.

As Downes (2014) emphasizes, MOOC is a *course* who engaging individuals in the learning process by connecting to the others and collaborating with the others on a specific network. This could be characterised like an *event*. MOOC is *open* because the work is accessible to individuals, without paying (maybe) and the work is shared. The course is *participatory/interactive* because involve the participants in different kind of actions with materials (e-books, e-library, videos...) or outside sources and with their brain. MOOC is *distributed* by twiter, facebook, youtube, google, flickr, linkedin, slideshare, videoconferences... and have a distributed knowledge base. The MOOC is step towards *lifelong learning*, has independence, work in own space, is an authentic network who ensures that individuals choose what do they want to do, choose how they want to participate and decide if they have been successful.

Connectivist approach of Siemens, Downes and Cormier tends to elude the professor's role in learning, focusing on individual participants in learning, networking and information flow between the nodes of the network, resulting new forms of knowledge. It is known that the main role of today professor is to give students the environment and the initial learning context for being together (in a human network - f2f), and after that, the role of advisor of the students to be able to build their own learning environments that to allow to connect to the learning success networks! It is hoped that lifelong learning

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will appears to individuals automatically by exposure to the flow of information and self-reflection. But the question is who will validate the quality of knowledge into the learning networks proposed by connectivism, who will expertise the learning? Anyway in this context, it can infer that there is no need for formal institutions to support this kind of learning, especially that such learning often depends largely on social media, easily accessible to all participants.

"There are numerous criticisms of the connectivist approach to teaching and learning. Some of these criticisms may be overcome as practice improves, as new tools for assessment, and for organizing co-operative and collaborative work with massive numbers, are developed, and as more experience is gained. More importantly, connectivism is really the first theoretical attempt to radically re-examine the implications for learning of the Internet and the explosion of new communications technologies."(Bates, 2015, p. 58).

3. My Contribution into the Application of Connectivism Learning Theory and Practice in Higher Education Field

For forming and developing students' skills required by this era (*Fundamental skills*: *Personal management skills*, *attitudes, and behaviours that drive one's potential for growth* and *Teamwork skills*) my philosophy on teaching and learning is: learning another is important that you provide the environment, context and respect for him/her to reflect, apply and win! Not so far away of what Downes (2008) say: „to teach is to model and demonstrate, to learn is to practice and reflect". This supports the transformation (not only change) of the student, from knowledge, skills, attitudes and feelings point of view! In this philosophy students learn through motivation and application, the learning activities (courses, seminars) are more on the students than the professor, and technology can be used to enhance learning in the aula.

But taking act about connectivism theory of learning, where the knowledge does not reside only in the mind of an individual, knowledge resides in a distributed manner across a network, and "the networked act of learning exists on two levels: 1. Internally as neural networks (where knowledge is distributed across our brain, not held in its entirety in one location) 2. Externally as networks we actively form (each node represents an element of specialization and the aggregate represent our ability to be aware of, learn, and adapt to the world around)" (Siemens, 2006, p. 10), I revised my methodology of teaching, learning and evaluation.

Accepting that what we learn depends on how we interact I do not exclude face-to-face learning activities (when interaction is felt through intellectual sweat) but I am aware about the fact that student can learn also through learning networks because technology provides core ways to build a network. However students must be trained for being able to decide if the network is relevant because not all information is necessary or relevant in terms of knowledge.

I say this considering that *data* (+ relevance + purpose) ↦ *information* (+ application) ↦ *knowledge* (+ intuition + experience) ↦ *wisdom* after Liebowitz (1999), or by Siemens (2005), the highest level in the hierarchy of knowledge is *meaning* – the comprehension of nuances and implications of knowledge. That's I want to improve to my students and my efforts were concentrated in this niche.

Thereby, in my courses and seminars, in particular such as: Computer Assisted Instruction (CAI) or Information and Communication Technology (ICT), e-Learning in Teacher Training, but also such as

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Theory and Methodology of Curriculum, Intercultural Education or Quality Management in Educational Organizations, I have given to my students, during the first meeting, a written framework (electronic) of the learning situations for each chapter, with basic knowledge as a ground for making an understanding of the facts and forming meanings on their own way. Because, in my opinion, firstly we must understand the concepts, notions, facts, and after that, we can get their meanings for growth of our wisdom. This framework is related to the learning outcomes of the course, having also inserted modalities of assessment.

This way, my role is like moderator, facilitator and tutor of my students who want to learn and to have more wisdom in confrontation with the real world and requirements of the labour market. My role is not that transmitter of the culture values, but transformer of the students' mind into a reflective one, for building well-formed heads, using these culture values in a proper way. In which way?

Making them realize that each person sees the „new" from a certain perspective, each piece contributes to the whole if we interact well into an honest collaboration and co-operation with others into learning actions, establishing connections, in other words, creating networks, whence we can promote feedforward and we can get feedback.

Habitual, the students answer to my question: „What is the meaning of...?" with what they understood, with their acceptance, but sometimes they say: „I'll Google it!", and I allow them to do it, either from computers in the room or using their Smartphone.

For example at my questions „What is the meaning of curriculum?" or „What does it mean for you, Computer Assisted Instruction? But e-Learning?" the students have had at their disposition the electronic course materials, where they found the background of the terms and at the same time, two web links for each of the terms. They have had enough time for individual study and search on the Internet, so that to have an answer in a time agreed. Until the final answer, they discussed what they found in groups of two, then with other groups, to decide which is the ultimate form of presentation in virtual format (docx, rtf, pdf or pptx.) to the professor. After this exercise, the students had to seek new resources to the same topic on which to compile them and to improve their initial understanding and present them again to professor but also to fellows.

For this learning situation they were able to use also Web 2.0 instruments as well as: blogs, wikis, YouTube, Twitter, Facebook, LinkedIn, Hi5, Myspace, Google docs, PowerPoint or Prezi, some of them I put at their disposal, with a description and demonstration of how to be used in educational purposes.

During all this process, I was behind and along with the students (f2f or by Internet) for giving them certitude that they are on a right road. I say that I was near to them, near to their choice, because of their need for confirmation of what one's discovered and of its value into the field of cognition, without having any expertise for taking the role of node of knowledge. But working with them in this way and accustomising them to certain methods, they will be able to hold their own expertise necessary for choosing right and appropriate contents in the future.

Thereby, I allowed students to aggregate (to see and listen to many diverse sources), remix (to bring these different perspectives together), repurpose (to reform these new ideas in their own way) and feedforward (to share their perspective before deciding the final solution) the data from the Internet for transforming it into information, knowledge and meanings. In these learning activities they are free to ask questions, to experiment, to explore, to discover and to create, both f2f and in virtual way, new

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understanding of the concepts, for sharing them into a network designed for this purpose, that means there are elements of connectivism learning and germs of MOOCs.

When I have given them a task which claims problem-based learning or project-based learning methods, students have had, at the beginning, a description of the criteria for choosing a successful network, identified by their properties characterized, as Downes (2012) suggest, by diversity, autonomy, openness, and connectivity!

After this impulse, the students took the algorithm for searching successful networks and went further to explain the practices that could lead towards such networks. Thus it came to creating a network of learning, on University LMS (Moodle Platform) in that subject, but only between my students. The next step was to seek similar networks to get in touch with them. These were not simple, and fully failed.

The results of this enterprise can score on few levels:

- Increased student motivation for authentic learning - quantitatively proven by the results obtained during the semester and at the end of it;
- Formation of a cohesion among students for solving tasks by increasing interpersonal communication, both virtual and f2f way;
- Satisfaction of using constantly IT tools, some accessed daily, others discovered during courses and seminars, what for them was „cool";
- The finding of how hard it is to build a learning network.

We are at the beginning of that form of connectivism learning and I joined it for trying, myself, to deepen and to apply it to verify the milestones of this new philosophy in learning activities with the students. It is not easy because it takes a lot of dedication and continuous, well done work, to build a network with true knowledge in the field then, to link with other networks with the same interest.

Generally speaking, our outdated technology and educators' mentality are somewhat the great handicaps in researching the advantages and limits of connectivism, not as a fashion but as a possible reality of our age. Outdate technology, as consequence of lack of financial resources, and educators as lack of training.

From other point of view, learners are raised in a minimum intellectual effort for their harmonious personal development. And we can ask, in these conditions, how can we research the benefits of connectivism or its constraints? But we do not capitulate, we are questioning and we try to give answers, step-by-step to these trends in educational sciences.

4. Conclusions

Exponential development of knowledge, relentless research in artificial intelligence and neuroscience, as well as new paradigms of educational sciences require the creation of a new theory of learning that meet the socio-economic evolution that is compatible with individuals who learn, educating themselves. An alternative is needed. In this picture/tableau of requirements and needs for learning in digital age, Siemens and Downes have came with the theory of connectivism.

Our obligation as educators requires an increased attention on learning trends, on needs of learning process and not be distracted of fads of nowadays. Obviously our desire is to be close of the needs of our students in connected world, taking in consideration what is value for the learning process in the network

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and could and should be shared. Instead of boring courses or seminars for forming and developing learners' professional and transversal competences for careers, we have an obligation to create a learning ecology (environment) where learners are able to shape their own meaning. Where we fail to react to changes, learners will pursue alternatives.

Obviously, for many professors but also for students, learning theories are less relevant than the practical application of theories in learning process so for many of them are important the answers of the researchers in educational sciences for this issue.

This was my mobile, not to tell students about the new learning theory and its concepts, but to try it, partly into the learning activities and it was well for my students. They learned actively, conscientious, with satisfaction of IT involvement as part of their everyday life, fulfilling the outcomes, embodied in the marks of appropriate disciplines.

As Siemens pointed „Of most importance is that educators are reflecting on how learning has changed and the accompanying implications to how we design the spaces and structures of learning today." (Siemens, 2006, p. 39) we are called to be aware of our role to design, organize, perform, evaluate and adjust the act of learning for current generations, with or without connectivism theory but taking in serious consideration the impact of IT in our everyday life.

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