Connectivism’s Role as a Learning Theory and its Application in the Classroom

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Abstract

The authors’ research conducted for this paper focuses on how an emerging learning theory by George Siemens, connectivism, fits into current educational models. The main principles of connectivism are examined and described while referencing Siemens’ own writing. There are conflicting arguments as to whether or not connectivism can be called a learning theory. The authors look at several articles from both sides of this argument and provide a summary
of these findings. Although there is not a large amount of research currently available on the application of connectivism in education, the authors explain some possible applications, such as: social networking, personal learning environments and open courseware. The authors contend that while connectivism may not be specifically classified as a learning theory, it’s role in today’s education must be considered and addressed.

**Introduction**

For many years educators and researchers have examined the topic of how people learn. Several widely accepted learning theories have developed over the last hundred years. But do students learn the same way today as they did 100 years ago? Has technology changed the way our brain process and connects information? Do the students of today learn new information more efficiently than their teachers? George Siemens thinks so. Siemens has developed an emerging learning theory he called “connectivism” which addresses how learners in the digital-age process and retain new information.

**What is Connectivism?**

Siemens has theorized that learning is made through forming networks of connections. In our current, digital-age we are constantly in contact with the Internet, and an abundance of new information, through our computers, tablets and smartphones. How we filter the important information and make meaning of it is vital to Siemens’ theory of Connectivism.

Connectivism has several principles, of which include (Siemens, 2004):

- Learning is a process of connecting specialized nodes or information sources
- Capacity to know more is more crucial than what is currently known
- Information being current is the intent of all connectivist activities
- Decision-making plays an important role

In his book, *Knowing Knowledge* (2006) Siemens discusses how making connections forms the basis for learning. Gaining completely new information can be taxing on the brain because it forces learners to make new meaning and try to make new connections. However, if students already have a strong base of knowledge about the topic, it is easier to learn the new information (Siemens, 2006). To support this, Siemens uses the example of a psychologist and a farmer learning about a new theory of motivation. The psychologist would have a stronger foundation of knowledge to connect this new learning to, thus they would learn it much more rapidly (Siemens, 2006). With this concept in mind, Siemens explains how learning is not just stored within the individual, but also within a network. The network of individuals is what helps the knowledge to continue to flow like a river. This flow through the network allows all individuals to receive the most current information. It is up to the individual to decide which information is important, however, when a group of like-minded individuals comprise the network, the information will mostly be relevant. If the individuals have varying degrees of understanding of the topic it may be more difficult to ensure accuracy and consistency of the information.

One central tenet of connectivism is that “the ability to learn what we need to know for tomorrow is more important than what is known today” (Siemens, 2004). This statement puts an emphasis on how integral it is for learners in the digital age to be able to find their desired information. Having a set of Personal Learning Networks (PLN) or Personal Learning Environments (PLE) allows the individual to create the necessary connections to quickly retrieve
the desired knowledge (McElvaney & Berge, 2009).

**Is Connectivism a Learning Theory?**

University students in an education program are usually required to take a course on the theory of learning. This is to provide them with a greater understanding of how people learn, and how to create an environment for optimal learning. Famous theorists such as Piaget, Vygotsky, or Skinner and their respective learning theories provide a major focus for these courses. But do people still learn the same way now then they did when these theories were first spoken of? Has technology introduced a new way of learning, not just how we get the information, but how we retain it? George Siemens believes so and, furthermore, he believes that his theory of connectivism should be entertained by educators worldwide.

There are conflicting arguments as to whether or not Connectivism can be described as a learning theory. Several scholars have argued against Connectivism being described as its own learning theory. Verhagen (2006) argues that Siemens has not demonstrated how Connectivism has explained any phenomena (which Verhagen states is a requirement of a learning theory) because his arguments are not specific enough to do so. Kop and Hill (2008) come to the conclusion that while Connectivism does have a place in terms of pedagogy, it can't be called a learning theory in its own right. Their claim can be supported by Ally’s (2004) assertion that educators do not need to create brand new theories for the digital age, but rather adapt older learning theories to utilize current, digital resources. Other researchers have promoted Connectivism as a new way of learning, but not necessarily a learning theory. Williams, Karousou & Mackness (2011) write that Connectivism can be beneficial in informing the curriculum and that Connectivism, as well as other emerging learning theories, should be combined with traditional approaches for a more flexible, and adaptive framework of instruction. Connectivism as a guideline for instruction and curriculum has also been referenced by Ravenscroft (2011) who claims that Connectivism in education has given rise to a new type of dialogue, through social, networked learning. Bell (2011) also discussed this social, networked learning, as people are able to distribute their created works through the web. Also, the creation of these internetworked technologies has promoted connecting persons of similar, which will provoke more discussion, knowledge-sharing and learning.

**Application of Connectivism**

Other Connectivist principles includes having a strong currency (up-to-date and accurate knowledge) and the ability to form connections and then connect to ideas and concepts which must be nurtured and used to facilitate learning (Ravenscroft, 2011). Downes in his 2006 research stated that “The capacity to form connections between sources of information, and thereby create useful information patterns, is required to learn in our knowledge economy.” Siemens followed up Downes thoughts by eloquently stating that “Today, knowledge is the economy…We have to unlearn what no longer serves us well….to function in the new world of knowledge, we need to see the power of connections” (Siemens, 2006).

Applying connectivism theory in education is not as complex as one might imagine. Take this paper for example: The authors were tasked with constructing a theoretical paper. The authors were given the freedom to choose the topic that they were most knowledgeable and excited about. With the use of technology, collaboration opportunities have presented
itself through active involvement and communication with each other. While the instructor has been a resource for support and academic advice, the authors were given complete independence to connect with their peers and other like-minded people in order to gain the most accurate information, not only on the subject matter but also the writing process. It is also note worthy to mention that the authors live on different continents, have undoubtedly different academic and professional experiences and have diverse opinion which creates a variety of knowledge; however, the authors share a common bond in the research and construction of this paper. While this example may be a crude way of responding to connectivism as it applies to education, its elements assist in describing how connectivism exists and the critical nature of learning networks that connectivism uses as its life source.

**Learning and Social Networks**

Siemens has continually affirmed the importance of learning and social networks, specifically outlining the uses of such as a connectivist approach. Siemens (2005) states that “Networks are constantly forming. As a dynamic process, networks can aggregate into larger structures or a network of networks.” As humans, we come in contact, through our every day dealings, with those whom we work with, have family ties with or simply connect through other shared interests, thus we all have a learning and social network. As we go about our day, we move from one network to the next.

Participating in such networks and interacting with different perspectives, a community can arrive at new learning. Connectivism is fed by diversity and autonomy (Downes, 2008). Diversity expands both the quantity and quality of information a group has. Diversity, coupled with autonomy--the freedom an individual has to choose the information, creates a stronger social network. For example: imagine, if you will, a classroom full of students. These students have been tasked with reading the same materials and then discussing the readings as a group. While these students are unique in their own way, they may all end up at the same conclusion because they were all given the same information. With limited opportunity to expand their knowledge, the students have gained very little in regards to what they already know and where to proceed to next. Social networking has happened, but at a disappointing level.

Moodle, Blogs, Facebook, Twitter, Youtube and other Internet driven media which have an active discussion and sharing element to it, allow a group of people who are generally interested in the topic (or invested in other ways) are free to come together and explore different ideas using multiple sources as a way to affirm their point. The focus, however, is not to try to come to a consensus regarding a particular topic but rather to create ongoing dialogue.

In a global perspective, technology offers unique opportunities to participants who use social and learning networks. Boundaries have been reduced and the ability to connect with other users around the world is endless. Information can be shifted from one part of the world to another, and this has caused an increase in the quantity and quality of information at our fingertips. Diverse social network groups are expanding also, creating frequent and complex dialogue.

Connectivism requires that social networks are engaged by prosumers rather than consumers—that is, learners must be free to add to the content and discussion rather than simply take from it and as such, “User participation to the creation, sharing, use, and management of resources through social software” is key to the learning theory (Pettenati, Cigognini, 2007). These
participants have a mentality that looks forward to using what they know in the present to build off of in the future—they learn today so that can know more tomorrow and have the capacity to do so (Kop, Hill, 2008).

**Personal Learning Environments**

Another way that Connectivism can apply to education is through Personal Learning Environments. Personal Learning Environments (PLE’s) are systems in which learners take control of and manage their own learning (Van Harmelen, 2008). This independent form of study is linked to connectivist thinking by sharing in the vision of autonomy and engaged learning through social networks. The freedom to choose what to study and how to study it is an alternative approach to education. The emergence of PLE’s has de-centralized education and taken it out of the hands of traditional institutions and into the hands of the learners. This phenomenon can be largely attributed to technology.

A 2008 study conducted in Bolton, United Kingdom provides a foundation as to how PLE’s are constructed. Scott Wilson (2006), the main author of the study stated that: “PLE is not software. It is an environment where people and tools and communities and resources interact in a very loose way...such networks (create) a “living” quality” as opposed to typical Virtual or Learning Management Systems. The “loose” connection Wilson refers to can arguably describe Distance and Learning Networks. The study enumerated 77 tools which learners used to engage in activities which in turn created individual PLE’s. These 77 tools stemmed from instant messengers to news aggregation tools to authoring and collaboration tools that “invites self-directed learning” (Haskins, 2007).

Personal Learning Environments have helped and continue to help learners who are unable to study using traditional classroom methods through means of engaging, retaining and supporting students in open and distant educational initiatives. Sir John Daniel stated the following: “More than one-third of the world’s population is under 20. There are over 30 million people today qualified to enter a university who have no place to go. During the next decade, this 30 million will grow to 100 million” (Daniel, 1996). Qualified students who, for whatever reason, cannot attend a traditional University or college can benefit from a PLE style Open University. In a 2010 journal article, the authors Hilton, Graham, Rich and Wiley studied the effects of distance learning and concluded that learners did benefit from the interactions they had with their learning network, most notably the professor and other students. The success of this study was largely due to technology providing “interactions between both face-to-face and distance learners.” (Hilton, Graham, Rich, Wiley, 2010). Most open courseware (OCW) is free to attend and participate in and furthermore, class sizes require a networked discussion where the professor provides the topic and an avenue that students follow, but the academic readings are often chosen by the students themselves.

Open courseware, most recently in China, has gained popularity due to its accessibility and push for content translated into languages other then English. In Japan “9 of the most prestigious universities are engaged in the Japanese OCW Alliance that offers over 250 courses in Japanese and an additional 100 in English” (Hylén, 2006). This again, lends itself to the connectivists requirement for diversity and autonomy.
A more recent example of PLE’s is that of Massive Open Online Course (MOOC). MOOC allows for open enrollment, and is asynchronous which promotes international network learning and participation, especially from professionals who are seeking further development. MOOC also has a distributed knowledge base which uses tools such as blogs, aggregated feeds, Facebook and Second Life to encourage social and learning networks around the world (Masters, 2011).

**Conclusion**

Technology, specifically web 2.0, has forced the creation of new theories and coined terms to define 21st Century learning. Karen Cator, Director of the office of Educational Technology and the U.S. National Board of Education has repeatedly pushed towards 21st Century learning in order for America to compete in a global community (edutopia.org, 2011). While the original theories of learning attempt to explain the process of how one learns, connectivism concerns itself with what is being learned. With the growth of technology software and hardware, connectivism was coined to create a clear learning theory in which teachers, instructional designers and, more importantly, learners can integrate and utilize tools that provide a two-way learning environment that is capable of equipping students with critical thinking, problem solving and global participation skills.

While we may continue to refer to connectivism as an emerging theory because, compared to other theories, it is new and because there is not enough empirical data that satisfies connectivism’s critics. However, with the vast web 2.0 applications that are created daily and the reliance of such technology in the world and for the most part in education, the connectivism theory is gaining momentum.

Education is undoubtedly shifting “from formal, rigid learning into an environment of informal, connection-based, network-creating learning. The instructor or institution can still ensure that critical learning elements are achieved...while the links and connections are formed by the learners themselves” (Marhan, 2007). With this shift comes open education in which students are permitted to create their own learning and curricula through blogs, wikis and other collaborative platforms, where boundaries are non-existent and content has no physical location. It is through connectivism “that individuals co-create knowledge in a global, networked environment” (Darrow, 2009). Connectivism fits the present approach to learning and answers the question as to how learners connect information in the digital age; However, educators must ensure this theory is properly integrated into every facet of education rather then its current uses in higher education in the form of open courseware to promote 21st Century learning.
References


