Vega

Connectivism: la teoria educativa delle reti

Connectivism: the educational theory of networks

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Abstract

The significant use of electronic media in everyday life requires new considerations about learning, about communication, about being in the spaces of ubiquity.

Siemenes (2005) proposed the theory of networks, the learning through networks, the connections between nodes, which Landow (2006), Bolter (1991, 1996, 2001), Cassany (2012) have at different times called even if other terms.

The relevance of the theory of Connectivism offers new fields of investigation and experimentation for the area of education, which deserve reflections and insights that enable to validate, based on the need for education and training simultaneous, the applicability of a theory of networks.

Keywords: connectivism, education, technologies, communication, networks

Riassunto

Il rilevante uso dei media elettronici nella quotidianità richiede nuove riflessioni sull'apprendimento, sulla comunicazione, sull'essere negli spazi dell'ubiquità.

Siemenes (2005) ha proposto la teoria dei network, dell'apprendimento attraverso le reti, delle connessioni tra nodi, che Landow (2006), Bolter (1991, 1996, 2001), Cassany (2012) hanno in differenti occasioni richiamato anche se con altri termini.

L'attualità della teoria del Connettivismo offre nuovi campi di indagine e sperimentazione per l'area educativa, che meritano di riflessioni e approfondimenti che consentano di validare, in base alle necessità educative e formative contemporanee, l'applicabilità di una teoria delle reti.

Parole chiave: connettivismo, educazione, tecnologie, comunicazione, reti

Introduzione

L'educazione e il contesto educativo continuano a modificarsi, si adeguano gli spazi a nuovi strumenti per la comunicazione, e gli approcci alle materie insegnate cambiano verticalmente, dalla progettazione alla valutazione, condizionati dalla tecnologia elettronica. Molti sono gli studi internazionali realizzati in merito, tanto in Italia, quanto in Spagna, così come numerosi sono i progetti europei, che hanno cercato di ricercare e comprendere gli sviluppi delle tecnologie contemporanee (fig. 11).
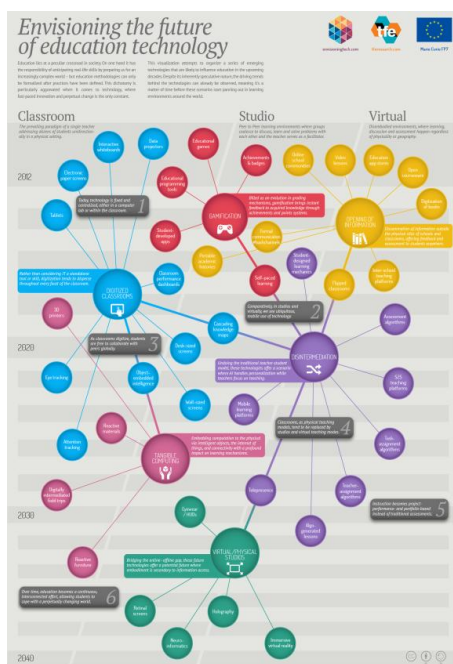

Figura 11 Envisioning the future of education technology (Envisioningtech.com, Marie Curie FP7 EU 2012)

Secondo lo schema sopra proposto (fig. 11), esito di una specifica ricerca europea, in cui l'obiettivo è stato quello di comprendere e valutare l'applicazione delle tecnologie in ambito educativo. Il target d'analisi cronologica proposta va dal 2012 al 2040, offrendo un ampio ventaglio di sollecitazioni, su più di trent'anni di cambiamenti dinamici e ri-mediazioni di tecnologie elettroniche.

Nella infografica (fig. 11), i nodi individuati nell'evoluzione delle tecnologie per l'educazione, sono nel caso specifico suddivisi in sei macroaree: *digitized classroom*, *gamification*, *opening of information*, *disintermediation*, *tangible computing* e *virtual/physical studios*[1].

Ogni macro area si incrementa in base all'evoluzione stessa degli oggetti, che le gravitano attorno, prodotti e sviluppati per spazi specifici, come nel caso dei *Tablets* per la *digitized classroom*.

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[1] Si veda la pagina di riferimento al progetto in rete http://envisioningtech.com/education/

Learning as Network Creation[2]

Connessioni e nodi, che si sviluppano e diramano nelle differenti macroaree, amplificando le possibilità di ricerca e innovazione, tanto tecnologica, quanto linguistica ed educativa.

Alla adeguata e produttiva applicazione delle connessioni tanto tra tecnologie elettroniche quanto educative per il contesto didattico, si è giunti a seguito degli studi sulle teorie di Siemens (2005) in merito al connettivismo, rintracciabili nel paper, *Connectivism: Learning as Network-Creation*.

> More recently, constructivism has been presented as a free-floating theory of learning as an individually constructed experience.
> Underlying each theory is a deeper ideology and worldview. Philosophers, psychologists, theorists, and linguists have long debated the nature of learning and knowing. Is learning the process of aligning and knowledge an interpretive process (i.e. we learn as we experience, and truth is revealed through our action and cognition) (pragmatism)? Or is learning a process where we create our own truth through our own perspective of the world (interpretivism)?
> Something is missing in this debate. Knowledge and truth can exist in a variety of way. Different perceptions of what if means learn (or possess knowledge) do not need to be seen as exclusive. To some degree, objectivism, pragmatism, and interpretivism provide partial insight into a specific aspect of the learning and knowledge process (Siemens 2005: 4).

In merito a quanto è stato teorizzato da Siemens (2005), sulla base dei processi, che interessano e coinvolgono una pluralità di soggetti, attorno al "connectivism", è necessario riconoscere le caratteristiche che contraddistinguono gli spazi per l'educazione e l'apprendimento.

Nella proposta teorico di Siemens, alcuni degli obiettivi da lui proposti sono: "develops reciprocity and cooperation among students, encourages active learning, emphsizes time on task" (Siemens 2005: 12).

Al fine di procedere in una formazione veicolata da network tecnologici, in cui spesso sono assenti feedback, o comunicazioni tra pari a causa della diffusione non controllata di messaggi verso tutti, e non diretti a singoli interessati si deve procedere con lo sviluppo di "network, nodes and connections" (Siemens 2005: 5-8; Landow 2006).

The beauty of network is their inherent simplicity. A network requires at minimum two elements: nodes and connections. Nodes carry different names in other disciplines (vertices, elements, or entities). Regardless of name, a node is any element that can be connected to any other element (Siemens 2005: 5).

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[2] Siemens (2005).

I network secondo Siemens (2005) includono nelle proprie strutture, degli elementi neutrali come i "data", delle informazioni come rappresentazione dei "data" organizzati secondo criteri specifici, la conoscenza come insieme di informazioni contenute in un contesto, e dai significati che comprendono i valori e le implicazioni della conoscenza.

L'ulteriore componente di questa struttura connettiva è data dai nodi, intesi come connessioni tra oggetti fisici, informazioni, e persone.

> The aggregation of this nodes results in a network. Networks can combine to form still larger networks (each node in a larger network can be a network of nodes itself). A community , for example is a rich learning network of individuals who in themselves are completed learning networks.
>
> Nodes are characterized by a general sense of autonomy. A node may exist within a network, even if it is not strongly connected (Siemens 2005: 6).

Mentre le connessioni descritte da Siemens, parte della struttura per l'apprendimento connettivista, sono composte da un numero di fattori, che sono:

- Motivation – motivation is a difficult concept to fully detail. The difficulty arises in that motivation is influenced through our emotions and logic. An individual with a clear goal may have significantly greater motivation to learn a new subject. Keller's (1987) ARCS model communicates part of the challenge evident in fostering motivation. Numerous factors of attention, relevance of information, our sense of competence, and satisfaction impact the likelihood of connection forming. […] Motivation determines if we are receptive to particular concepts as well as our desire to foster deeper network connections through the items listed below (reflection, logic/reasoning, etc.).
- Emotions and how we feel play a large role in how we value nodes and permit the presence of contradictory perspectives. Consider as an example, the phenomenon of global warming. General consensus exists that we are at least partially to blame. For many people, however, only limited lifestyle changes have occurred. How can this concept be seen in light of connectivism (or network learning)? Quite simply – the emotional and motivating nodes (the network itself is simply a node in a larger network. The process scales and reduces based on the size of the network we are considering) evaluate perspectives of global warming in relation to daily lifestyle (commuting, recycling). Until the node of "global warming" begins to impact the quality of life for the individual, many may continue to be comfortable with their global warming node, and route around it. Others may be more sensitive, and place greater emphasis on the concept of global warming because it more seamlessly integrates with the existing

network. Reworking and recreating a network at its core takes time. Emotions are the influencing factors that enact other nodes and apply weighting scales to the network elements.

- Exposure – repetition is an excellent way of strengthening connections. A node grows in popularity (relevance) as more nodes link to it. Ideas that link strongly to other ideas are quickly integrated into the network. This is a big factor for the difficulty of personal change. […] The node exists but has limited traction within the entire network. As the node begins to form its own connections with other nodes (sense of self worth, happier, greater productivity at work, feel better), it gains traction and begins to link and connect to a greater degree with other nodes. The tipping point occurs when the node itself has created a strong enough network to begin to influence the entire thought process (neural network). Once it is no longer a rogue node, it continues to embed itself as node that is used by the rest of the network. Innovation within corporations follows a similar path. New ideas and processes are initially seen as threats by the rest of the organization (organism). As a result, the node is treated as a fringe element and left largely unconnected. However, if the idea (node) has true merit, it will continue to form connections within the network until it creates a sub-network of connections within the larger structure. At this point, it has the capacity to influence the larger network that originally resisted it.

- Patterning is one of the most significant elements of learning. Patterning is the process of recognizing the nature and organization of various types of information and knowledge. The shapes created by these structures will determine how readily new connections can be made. For example, a learner in the field of medicine (who is aware of the nature of their own learning network) may recognize pattern similarity of elements between her field and the field of philosophy. The recognition of these patterns can result in exponential knowledge growth through connecting similar network elements. Duplication can also be minimized. This concept is quite interesting in light of how network theory was popularized in recent literature. […] Much new knowledge will be generated in the future as specialized fields become more aware of each other.

- Logic is a cornerstone in the learning process. Much of what we know (and have learned) is the by-product of thinking and reflection (reflection is much like logic but permits greater interplay of emotions). The process of thinking involves organizing and structuring our learning networks. As a reflective activity, logic can provide time for nodes to form connections. Connections *can* be formed without conscious thought, but the process is substantially improved when directed by focused reasoning. Logic is an ingrained connection-forming task, evaluating and recognizing patterns between different concepts and network elements. Cognitive neurology is rapidly developing our understanding of logic and cognition.

- Experience is also a significant aspect of network creation. A great deal of our learning comes through informal means. Experience is a catalyst for both acquiring new nodes and forming connections between existing nodes. Learners who graduate from

university or college often have the information and knowledge nodes, but connections themselves do not form fully until the learner is active within his/her field. Experience in this sense is largely a facilitator of connection forming (Siemens 2005: 8-13).

Il recente studio proposto da Caldarelli e Catanzaro (2012) per la Oxford University Press, è stato realizzato sulle base delle potenzialità di sviluppo e utilizzo dei nodi ipertestuali (Landow 2006) nella loro contemporanea rappresentazione più evoluta, ovvero nei già citati "networks".
Implementa così ulteriormente l'apporto teorico anticipato da Siemens (2005), in merito al connettivismo, e alla possibilità di apprendere a partire dalle attuali idee di connessione sensoriale e telematica (De Kerckhove 2008), e network.

Conclusione

La presenza di continue connessioni telematiche (Carr 2001, 2004; De Kerckhove 2008) ha contribuito alla creazione di un web, oggi 3.0 o semantico. Sulle "webs of words" (Caladarelli, Catanzaro 2012) che continuano ad apportare modifiche, anche a livello educativo, i due studiosi hanno evidenziato differenze e variazioni utili nella ricerca.

> We can now create our own maps of language. We use words as vertices and the edges connect synonyms, antonyms, and polysemic words (these relations can be drawn from a thesaurus or a dictionary, while patterns of co-occurrence can be drawn from large language databases, such as the *British National Corpus*). Semantic connections are more difficult to pin down: their study forms a complete area of linguistics. Some languages have special dictionaries that associate one word with a set of related ones. An alternative approach is experimental *word association*. A word is provided to a sample people, asking them to say the first word that comes into their mind after hearing it. The resulting words are then used to repeat the association experiment. Proceeding in this way, step by step we build our web associations. Different instances of word networks display different results. These depend on the language, on the kind of the text, on the education of the author of the text, or may be related to linguistic dysfunctions (Caldarelli, Catanzaro 2012: 33).

Riferimenti bibliografici:

Bolter, J.D. (1991). *Writing Space – The Computer, Hypertext and the History of Writing.* Hillsdale N.J.: Lawrence Erlbaum Associates Ltd.

Bolter, J.D. (1996). *Virtual Reality and Ridefinition of Self,* New York, Hampton Press.

Bolter, J.D. (2001). *Writing Space. Computer, Hypertext and the remediation of print*, Mahwah N.J., Lawrence Erlbaum Associates.

Caldarelli, G., Catanzaro, M. (2012). *Networks. A very short introduction*. Oxford: Oxford University Press.

Cassany, D. (2012). *En linea: leer y escribir en la red*. Madrid: Anagrama.

Carr, N.G. (2001). *Digital Enterprise : How to Reshape Your Business for a Connected World.* New York: W.W.Norton & Company.

Carr, N.G. (2004). *Does IT Matter?* New York: W.W.Norton & Company.

De Kerckhove, D. (2008). *Dall'alfabeto a internet. L'homme «littéré»: alfabetizzazione, cultura, tecnologia.* Milano: Mimesis.

Landow, G.P. (2006). *Hypertext 3.0.Critical Theory and New Media in an Era of Globalization*. Baltimore: Johns Hopkins University Press.

Siemens, G. (2005). Connectivism: A learning theory for the digital age. In *International Journal of Instructional Technology and Distance Learning*, 2(1), 3-10.