Renaissance 2.0: Connecting Dots

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Abstract

Rise of ICT and especially Web technologies have changed the nature of learners and learning and as a result, a need to revisit existing educational approaches to deal with technology enhanced learning was appeared. As a natural consequence of this need, this paper analyzes new learning paradigms and portraits the 21st century learning dynamics. Throughout this paper, based on a systematic review, relationships among Web 2.0, digital natives, and connectivism were explained and presented with a holistic portrait. On these bases, the purpose of this paper is to explain what’s happening in educational domain after technological landscape in terms of learners, learning environments and pedagogy.

1. Introduction

Both society and individuals have been influenced drastically since the globe met with online technologies. Overwhelmed by information and communications technologies (ICT), 21st century was called interchangeably as digital age (Rosenberg, 2001) or information age (Castells, 2011) which can be further defined as digital information age. In this technology driven era, the terms digital natives (Prensky, 2001) and netizens (Hauben, 1996) have been used to define the generation who internalizes technology as a routine of their casual life and to indicate their interpretation and perception of the technology (Bozkurt, 2013). This new generation regards computers, internet, mobile and ubiquitous technologies as a natural part of their daily lives. In their perspective, learning occurs as a consequence of their experiences (trial and error); doing is more important than knowing; multitasking is a way of life; staying connected is essential and there is a zero tolerance for delays (Oblinger, 2003). In addition to that, this generation has unique characteristics: They use technology as a tool for self-reflection and self-expression; in other words to create and form their digital identities. As well as creating digital identities and expressing themselves on Web, this generation use Web 2.0 platform to discover, create, gather, remix, present and share the data.

Web 2.0, with its attributes, appears to be a promising learning medium for the generation in digital knowledge age. It seems that digital natives followed the white rabbit and discovered the Wonderland in our networked globe. In this discovery, Web 2.0 represents the Wonderland with many opportunities as well as many challenges.

2. Web 2.0: Always On

Web 2.0 has many names such as wisdom Web, people-centric Web, participative Web, and read/write Web (Murugesan, 2007). All of these definitions indicate a structure which is based on creating collective knowledge. In addition to its collective nature, Web 2.0 has many other qualities, for instance:

- It is an attractive platform which enables independence and autonomy (Franklin & Van Harmelen, 2007; Greenhow, Robelia and Hughes, 2009);
- it promotes personalization, customization and creativity (McLoughlin & Lee, 2007);
- increases social interaction (Murugesan, 2007), and
- allows cooperation and collaboration (McLoughlin & Lee, 2007; Murugesan, 2007; Dede, 2008).

These qualities of Web 2.0 achieve Tim Berners Lee’s dreams for a single, global and collaborative information space (Anderson, 2007) which can be interpreted as Renaissance 2.0. The opportunities that came up with Web 2.0 became possible with the innovative “Web as a platform” idea which was outlined by inventors of the term as a platform where software applications are built on the web instead of the desktop (O'Reilly & Battelle, 2004).
3. Meta Cognition in Global Brain

In an online participatory culture (Jenkins et al., 2006), basically there are two types of individuals: producers and consumers who can be defined as “prosumers” (McLoughlin and Lee, 2007). Prosumers have multiple roles. They are netizens of the Web culture, creators of the collective intelligence and members of the “wisdom of crowds” (Surowiecki, 2004). They use Web 2.0 tools and services in the content creation process with active participation (Usluel and Mazman, 2009). Some of the Web 2.0 tools (Web based applications) and services (Web based works or performances) are social networking, blogging, podcasting, data/web mash-ups, wikis and collaborative editing tools, virtual worlds, tagging, curating, media sharing, media manipulation, syndication, instant messaging and chatting. Web 2.0 platform, with its tools and services, provides a digital environment that allows individuals interact, communicate and create interchangeably both with other peers and digital environment itself.

Interestingly, even though learners on networks are more independent, self-regulated and self-directed in their knowledge quest, they eventually produce a collective result (Anderson, 2007) as the principles of the Web 2.0 are about linking minds, communities and ideas (McLoughlin & Lee, 2007).

In today’s world, with the opportunities provided by Web 2.0 tools and services, it can be said that Web 2.0’s most significant attribute is harnessing collective intelligence and acting like a global brain (O’reilly, 2005). On Web, data is being collected, presented, and acted upon in real time with a constantly increasing amount of participation (O’Reilly & Battelle, 2009) and in this process, individuals began to act like organic sensors to feed the global brain.

4. Pedagogy 2.0: Combining Technology and Education

It is obvious that what, how and with whom we learn is reformulated by Web 2.0 (Dede, 2008). Even though not designed for educational purposes in essence, Web 2.0 services and tools as a primary source of knowledge and content (Maloney, 2007), has changed the nature of learning and learners (McLoughlin & Lee, 2007). Web 2.0 activities put the learners in the center of online activities and provided educational opportunities (Thomas, 2008).

Web 2.0 platform “enables hybrid learning spaces that travel across physical and cyber spaces according to principles of collaboration and participation” (Greenhow, Robelia and Hughes, 2009: 247). It has an educational potential (Bower, Hedberg and Kuswara, 2010) to further enhance the teaching and learning environments (Ajjan and Hartshorne, 2008); and to support active and social learning (Ferdig, 2007).

From now on, knowledge is distributed on networks rather than being isolated within individuals (Dede, 2007) and open to anyone who demands it. With this purpose, lifelong learners are circulating between formal, informal and non-formal learning environments (Greenhow, Robelia & Hughes, 2009). Web 2.0 with all these attributes emerges as a great learning platform and provides a rich environment distributed on networks which demands active participation of learners to harness it.

Under these conditions, a need for new educational approaches and pedagogies is felt (Fischer & Konomi, 2005) to make learners active participants rather than passive consumers of the content, and to empower learning as a participatory social process supporting personal life goals and needs of individuals (McLoughlin and Lee, 2007). Therefore, it is a necessity to examine and explain learning and learners under new conditions brought by Web 2.0.

5. Understanding How Learning Occurs

The paradigm shift affected and changed learning environments, learner characteristics and pedagogy as well. Learners’ exposition to technology shaped their learning styles, strengths, and preferences (Dede, 2005) and this required to revisit and update what was known about learning. To be able to understand how learning takes place, we should explain how learning occurs in digital information age with digital learners. Therefore, there is as a necessity to revisit Bloom’s Taxonomy and to examine connectivism.

5.1. Bloom’s Taxonomy

Bloom’s Taxonomy (Bloom, 1956) is a widely accepted framework with six cognitive processes. Bloom thought this taxonomy as a work in progress (Munzenmaier and Rubin, 2013) and therefore the original version was updated for 21st century learners and learning paradigms (Anderson and Krathwohl, 2001) (Figure 1). Though it seems minor, new version presents quite significant changes and meets today’s educational needs offering educators a great tool to design their lessons (Forehand, 2010).
Anderson and Krathwohl’s (2001) revised taxonomy presents a context-free model and focuses on learning rather than the technology (Bower, Hedberg and Kuswara, 2010). Bloom’s Original Taxonomy was revised with the intention of making it up to date and more compatible with new learning requirements. However, with the idea that “what determines cognitive level is not the tool itself, but how the technology is used” (Munzenmaier and Rubin, 2013: p.26), Churches (2008) went one step further and updated Blooms Taxonomy again for 21st century digital skills, Web 2.0 and digital learning. In updated version (Figure 2.), new action verbs were added (written in italics) to point how technology use is related to relevant skills.

By using updated version of Blooms Taxonomy, educational institutes may provide best strategies and educators can use targeted teaching methods to help learners analyze, synthesize and communicate information. Achieving these objectives can be possible when pedagogies and technologies are grounded in how students learn (Solomon and Schrum, 2007).
5.2. Connectivism: A Learning Theory for the Digital Age

After the rise of Web 2.0, connectivism, as a learning theory for the digital age, appeared to explain learning on networks. Connectivism is the integration of principles explored by chaos, network, complexity and self-organization theories (Siemens, 2004). Connectivism claims that “knowledge is distributed across a network of connections, and therefore that learning consists of the ability to construct and traverse those networks” (Downes, 2012: p.9).

In digital information age, the life-span, accuracy and validity of knowledge are shortening (Clinton, Lee and Logan, 2011; Kop and Hill, 2008) even though the amount of the knowledge is constantly doubling (Gonzalez, 2004). So, “the ability to seek out current information, and the ability to filter secondary and extraneous information” (Kop and Hill, 2008: p.2) is an important skill needed in digital information age. It is also stated that there is a fast and dense information flow in information ecology, that’s why it is difficult and also unnecessary to learn everything and store them. Considering that we expose to information ceaselessly, the ability to draw distinctions between important and unimportant information is vital and our ability to learn what we need for tomorrow is more important than what we know today (Siemens, 2004). Based on these ideas, principles of connectivism are as following (Siemens, 2004):

- 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.

George Siemens (2004) states that connectivism is successor to traditional learning theories: Behaviorism, cognitivism, and constructivism. As the pioneers of connectivism Siemens (2004; 2006) and Downes (2005; 2012) claim that these traditional theories are incapable of explaining learning in digital era. Traditional theories have their focus on traditional learning environments (Shriram, and Warner, 2010) and they cannot explain adequately what happens in Web based learning environments (Clara and Barbera, 2013). It is further highlighted that traditional educational theories are outdated and incapable of dealing with technology enhanced learning anymore.

Traditional theories have some limitations as they mainly concentrate on internal learning processes and are incapable of explain learning with technology and how learning happens within organizations (Siemens, 2004). According to Siemens (2004), behaviorism, cognitivism, and constructivism mainly focus on how learning occurs (internal process), on the other hand connectivism focuses on where the knowledge is (external process) (Table 1.)

The digital paradigm shift gives us a message that what happens in pedagogy today is a change from biological to digital theories which reflects characteristics of web culture, digital learners and learning.
Table 1. Prominent learning theories and connectivism (Siemens, 2009)

<table>
<thead>
<tr>
<th>Property</th>
<th>Behaviorism</th>
<th>Cognitivism</th>
<th>Constructivism</th>
<th>Connectivism</th>
</tr>
</thead>
<tbody>
<tr>
<td>How learning occurs</td>
<td>Black box—observable behavior main focus</td>
<td>Structured, computational</td>
<td>Social, meaning created by each learner (personal)</td>
<td>Distributed within a network, social, technologically enhanced, recognizing and interpreting patterns</td>
</tr>
<tr>
<td>Influencing factors</td>
<td>Nature of reward, punishment, stimuli</td>
<td>Existing schema, previous experiences</td>
<td>Engagement, participation, social, cultural</td>
<td>Diversity of network, strength of ties</td>
</tr>
<tr>
<td>Role of memory</td>
<td>Memory is the hardwiring of repeated experiences—where reward and punishment are most influential</td>
<td>Encoding, storage, retrieval</td>
<td>Prior knowledge remixed to current context</td>
<td>Adaptive patterns, representative of current state, existing in networks</td>
</tr>
<tr>
<td>How transfer occurs</td>
<td>Stimulus, response</td>
<td>Duplicating knowledge constructs of “knower”</td>
<td>Socialization</td>
<td>Connecting to (adding) nodes</td>
</tr>
<tr>
<td>Types of learning best explained</td>
<td>Task-based learning</td>
<td>Reasoning, clear objectives, problem solving</td>
<td>Social, vague (“ill defined”)</td>
<td>Complex learning, rapid changing core, diverse knowledge sources</td>
</tr>
</tbody>
</table>

Though there are some debates whether or not connectivism is a theory, approach or pedagogic framework, connectivism today is the idea that deals with learning on networks. Some base their argument on idea of connectivism ignores dialog and inner processes of learning. Contrary to that argument, learning on the Web made possible dialog of the individuals with learning environments, peers and the most importantly individual itself. It is better to remember that connectivist learners are autonom, self-regulated, self-directed and independent. The dialog of the individuals with other peers is important, on the other hand connectivism points out the dialogue between the self and network. As long as the link between the self and network is strong; meaningful and active learning occurs as a result of the dialogue, interaction and communication between individual and connected network. What makes connectivism collaborative, cooperative and participant is all about nature of networks; not individuals connected to them. As indicated before, even though connectivism emphasis the interdependence and autonomy of the self, what connectivist learners have on networks is finally a collective result.

6. Conclusion

Birth of internet was a beginning. By time, Web evolved from a static to a dynamic structure and this evolution ended up with the revolution which is called as Web 2.0. The effects of the Web 2.0 observed in many aspects of the life, society, individuals including human learning (Figure 3). Though it is within blurring borders of educational transformation, new millennium is beginning of a digital knowledge age in which educational paradigm shifts have happened. Higher order learning was redefined and Bloom’s Taxonomy was updated as a necessity. Netizens or widely known digital natives exhibited unique characteristics particular to net generation. In netizens’ technology oriented world, new learning theories were introduced to explain how learning occurs on Web and networks.
Traditional theories claim that learning takes place biologically in human brain and connectivism ignores this point to some degree. Yet, it is believed that Web is a global brain, a living structure connecting everyone in it. From this perspective, while the Web is not organic, each and every single individual connected to Web functions like a nerve system and organic sensors. Web functions as a digital nest where we explore, discover and learn. In contrast to traditional theories claim, learning also occurs on an artificial digital nest where meta cognition has been built and fed by biological living beings. In our digital nest, Renaissance 2.0 reasoned a new kind of species called as Homo Iunctus who lives in a connected world and forms a superior connected being for the promise of the big data.

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