

Multimedia and Interaction in Open Online Learning:

An Innovative Approach Using Digital Storytelling

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### Abstract

Massive Open Online Courses (MOOCs) have been garnering a large share of the headlines in educational news outlets recently. Despite this newly-found interest, the concepts behind MOOCs have been used in online education for quite some time. Many open online courses have tended to rely on basic traditional course design centered on recorded lectures and standardized assessment. But some courses do attempt to innovate with constructivist designs that lean heavily on student-centered learning. One such course has also added multimedia activities to their interactive course design for a unique course design that is creating an entire subculture dedicated to the course, with participants continuing their work on assignments even after the course is complete. This paper will examine the theoretical foundations of this course as well as others like it. Connections with research on open learning, student-centered interaction, and multimedia usage in learning will also be explored in relation to these courses.

*Keywords:* Massive Open Online Course, Connectivism, Interactive Multimedia

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For the past few years, Massive Open Online Courses (MOOCs) have been garnering a large share of attention with hundreds of thousands of students signing up for various offerings (Rodriguez, 2012). Daniel (2012) refers to MOOCs as the “educational buzzword of 2012” (p. 2). Various researchers have classified MOOCs into different types based on the theoretical or pedagogical concepts underlying the design. Rodriguez (2012) classifies two distinct types of MOOCs, one type that resembles an artificial intelligence MOOC offered at the University of Stanford (AI-Stanford Like) and another type that are referred to as connectivist MOOCs (c-MOOCs). Daniel (2012) refers to AI-Stanford-like courses as xMOOCs, a reference to the ever-present letter “x” in the name of many businesses that use this AI-Stanford-like model (<http://mitx.org>, <http://edx.org>, etc).

As some have observed, the concepts behind xMOOCs have been used in online education for quite some time. Daniel (2012) points out that “the xMOOCs now being developed by elite US institutions... follow a more behaviourist approach” (p. 2). Welsh and Dragusin (2013) point out that xMOOCs are “based on a more traditional format, with fixed structured content, centralized discussion forum support, and automated or peer-graded evaluation” (p. 54). Welsh and Dragusin contrast this approach with the typical cMOOC approach, where the focus is “on knowledge creation and generation” while “learners’ creativity, autonomy, and networking are encouraged” and “learners are expected to enrich the course’s content” (p. 54). The first true MOOC (the “Connectivism and Connective Knowledge” (CCK08) course facilitated by Stephen Downes and George Siemens in 2008) was originally based on cMOOC educational philosophy (Fini, 2009).

While xMOOCs seem to dominate the open learning conversation, some courses do attempt to innovate with connectivist designs that lean heavily on student-centered learning. One such course, Digital Storytelling 106 (DS106) at University Mary-Washington (UMW) in Virginia, has also added multimedia activities to their interactive course design for a unique course experience that is creating an entire subculture dedicated to the course, with participants continuing their work on assignments even after the course is complete. This paper will examine how the combination of connectivism, student-centered instruction, multimedia, interaction, and Sociocultural Theory have created a unique course that can offer many insights for other course designers to learn from, even if they do not teach a topic related to digital storytelling.

### **Overview of DS106**

The main course goal of DS106 is to “to provide people with competences to fully tell their own real-life stories by using new available web 2.0 technologies” (Levine, Lamb, Groom, & Minguillón, 2012, p. 1). DS106 is a student-centered course that utilizes social learning, open structure, multimedia, and interaction to create a unique experience in online learning (Levine, Lamb, Groom, & Minguillón, 2012). Participants may be students earning credit at UMW or anyone with internet access that join for the satisfaction of learning about digital storytelling. According to Levine, Lamb, Groom, and Minguillón (2012), the course itself “pivots on a blog (ds106.us) that aggregates all the activity of the course participants, but without being the centre of anything” (p. 1).

According to the “About” section of the pivotal DS106 blog (<http://ds106.us/about/>), students are required to create accounts at various social media sites (such as Twitter and Flickr) to support their work. These accounts and services are fed through various means back into the pivotal blog, which runs on the WordPress blogging platform. Students then sign up for weekly

announcements that will explain the graded requirements for that week. Students are not given specific assignment products, but are rather encouraged to choose from an extensive assignment bank (<http://assignments.ds106.us/>). Assignments in this bank are divided into various categories and ranked in difficulty by “stars” instead of points. Each week’s assignments might require students to complete a certain amount of stars in a particular assignment category (for example, “complete six stars worth of assignments in the ‘Mash-up’ category”). An additional twist to the course is that students are required to submit a certain number of new assignment ideas to the assignment bank. The DS106 website uses a variety of plug-ins and syndication-based designs to connect various student-created websites and accounts on various social media platforms back to the DS106 website. This helps to create the interaction and community necessary to support the students in the course, as will be examined later in this paper.

The “History” section (<http://ds106.us/history/>) of the pivotal blog also reveals another interesting aspect of DS106. In addition to examining various forms of multimedia digital storytelling, various offerings of DS106 have taken on specific “personalities”: everything from “The DS106 Zone” (a twist on the popular *The Twilight Zone* television series) to “Camp Magic MacGuffin” (where the course took on a summer camp feel). These “personalities” as well as the overall design of the course have created a certain culture surrounding the course. As will be examined later in the paper, this socially-based culture is an informal method that the course creators have unintentionally utilized that is based on Sociocultural Theory.

## **Literature Review**

### **Connectivism and Personal Learning Environments**

As previously examined, Connectivism is the main factor that distinguishes cMOOCs from xMOOCs. Siemens (2005) offers this definition of connectivism:

Connectivism is the integration of principles explored by chaos, network, and complexity and self-organization theories. Learning is a process that occurs within nebulous environments of shifting core elements – not entirely under the control of the individual. Learning (defined as actionable knowledge) can reside outside of ourselves (within an organization or a database), is focused on connecting specialized information sets, and the connections that enable us to learn more are more important than our current state of knowing. (p. 7)

Downes (2009) points out the importance of students creating a personal learning environment (PLE) that can assist them in making connections, finding important information, and actively engaging in a cMOOC.

However, connectivist learning is not without its difficulties. Kop (2011) found that students will need to be self-directed learners that are confident and competent in the tools they are using in order to be successful in a connectivist environment. Some have debated whether connectivism is really a new learning paradigm or just a mixture of older learning paradigms (Kop & Hill, 2008; Calvani, 2009; Bell, 2011). Kop and Hill (2008) point out the strong overlaps between connectivism and social constructivism and even constructionism. However, despite the criticism and debate over how to classify connectivism, Kop and Hill (2008) noted that it “continues to play an important role in the development and emergence of new pedagogies, where control is shifting from the tutor to an increasingly more autonomous learner” (p. 11). Regardless of where connectivism is eventually classified, the concepts behind connectivism are intertwined with the next aspect to be examined: student-centered learning.

### **Student-Centered Learning**

While DS106 is based in connectivism, different learners might experience different

levels of student-centeredness. Hannafin, West, and Shepherd (2009) describe student-centered learning as learning where the “individual assumes responsibility for determining learning goals, monitoring progress toward meeting goals, adjusting or adapting approaches as warranted, and determining when individual goals have been adequately addressed” (p. 194). Some of the overall goals, monitoring, and assessment in DS106 are determined by the instructor at the course level. However, at the individual assignment level, the presence of the massive assignment bank makes room for students to accomplish student-centered learning at this basic level of the course. Additionally, some sections of DS106 are experimenting with instructor-less offerings (see <http://ds106.us/2013/07/21/coming-soon-the-headless-ds106-course/>).

Student-centered learning itself is often seen as a positive learning design. For example, Wright (2011) performed a literature review of several instructors that wrote about moving towards a student-centered classroom and found the responses to be mostly positive. Wright (2011) concluded the literature review by saying that “the pedagogical literature indicates that many college teachers believe that a student-centered classroom provides a more effective learning environment and are making efforts toward this end” (p. 95-96). Wright (2011) makes the observation that some researchers have found that the instructor does not have to disappear completely, but take on less of a central role and more of that of a facilitator (see also Tärnvik, 2007; Salter et al, 2009; Weimer; 2002). In general, these observations lend support to DS106 being a student-centered course, as well as this design being an effective method of helping students learn about the course content (which in the case of DS106 is digital storytelling). The actual content of DS106 will inform the next section about interactive multimedia in learning.

### **Interactive Multimedia in Learning**

Multimedia is most commonly defined as a combination of at least two forms of media,

such as text, graphics, audio, and video/moving graphics (Tannenbaum, 1998). Krippel, McKee, and Moody (2010) point out that taste, touch, and smell are rarely if ever included in most definitions of multimedia. Krippel, McKee, and Moody (2010) also point out that the “importance of multiple channels for delivery of educational content can be found in the theory of multi-channel communication which confirms that when information is presented by more than one channel, there will be addition reinforcement, resulting in greater retention and improved learning” (p. 2). As previously noted, DS106 embraces multimedia as the main form of assignment submission for all students (Levine, Lamb, Groom, & Minguillón, 2012).

An additional concept that is often closely tied to multimedia is interaction. Tannenbaum (1998) felt that multimedia must have an interactive component in order to be considered multimedia at all. Tuovinen (2000) backs up Tannenbaum by stating that the “importance of multimedia and the value of interaction in distance education are commonly accepted” (p. 16). Interactive multimedia is also positively connected to active learning, a concept that is considered important in education (Moreno & Mayer, 2000; Schank, 1994; Mayer, 2003). In DS106, active interaction between students is one of the core foundations of the course (Levine, Lamb, Groom, & Minguillón, 2012). While much of the interaction is between the student and the content, there is also considerable student-to-student and student-to instructor interaction (Abrami, et al., 2011) by various social media outlets such as Twitter, email, Google Hangouts, and blog posts.

Some researchers and writers have also connected multimedia design with student-centered learning. Neo and Neo (2009) found that their “research study has shown that incorporating multimedia technology into a constructivist learning environment can lead to innovative teaching and learning methods for the improvement of classroom learning” (p. 265).



The constructivist learning environment that they refer to is one that matches the earlier description of connectivist student-centered learning, with students taking ownership of the learning process by interacting and collaborating with one another. Hannafin, Hill, and Land (1997) also connect student-centered learning with multimedia and interaction as well as culture. This connection with culture as well as social interaction leads to the next section examining Sociocultural Theory in connection with DS106.

### **Sociocultural Theory**

Sociocultural Theory is one of many ideas based on the writings of Lev Vygotsky (Mahn, 1999). Mahn noted several aspects of sociocultural theory, including two that are relevant to DS106: social interaction in a specific cultural context and the zone of proximal development. The zone of proximal development was described by Vygotsky as a crossable gap between what learners can learn on their own and what they can learn with the help of others due to social interactions (Vygotsky, 1978). DS106 creates a specific course culture that is based on socially interacting with other students with a goal of crossing the zone of proximal development.

Additionally, sociocultural theory seems to be often connected to constructivism in the literature (Edwards, 2005; Cobb, 1994), although the two are often seen as opposing ideas. In making his case for connectivism, Siemens (2005) suggested that constructivism was not adequate for modern learners. O'loughlin (1992) mirrors this sentiment by suggesting that education should take

a sociocultural approach to teaching and learning that takes seriously the notion that learning is situated in contexts, that students bring their own subjectivities and cultural perspectives to bear in constructing understanding, that issues of power exist in the classroom that need to be addressed, and that education into scientific ways of knowing

requires understanding modes of classroom discourse and enabling students to negotiate these modes effectively so that they may master and critique scientific ways of knowing without, in the process, sacrificing their own personally and culturally constructed ways of knowing. (p. 791)

This statement lays the groundwork for the combination of connectivism, sociocultural theory, and student centered learning that would come along over a decade later in cMOOCs.

However, sociocultural theory is not often linked with cMOOCs in general or DS106 specifically. Kop (2011) makes the connection between sociocultural theory and cMOOCs in this observation:

the research showed that there are some other conditions that clearly encouraged people's involvement and engagement in learning in a connectivist learning environment, including the 'social presence' of the facilitators and of participants, which enhanced the 'community' forming and the sense of belonging that built confidence and stimulated active participation. (p. 34-35)

Mahn (1999) observed that "Vygotsky located the origin of consciousness at the intersection of the intertwined and reciprocal development of language, tool use, society, and culture" (p. 343).

Vaisey (2006) examined the connection between culture and community, especially at how culture shapes a sense of belonging to community. Therefore, community can be seen as part of the culture that informs sociocultural theory. In many ways, sociocultural theory may have a stronger connection to cMOOCs than it has been given credit in the past.

### **Discussion**

Although "pedagogy" is often used to describe the methods used for teaching courses both online and offline, this term has not always been adequate to describe what happens in

cMOOCs and other emerging educational models. Blaschke (2012) points out that

pedagogical, even andragogical, educational methods are no longer fully sufficient in preparing learners for thriving in the workplace, and a more self-directed and self-determined approach is needed, one in which the learner reflects upon what is learned and how it is learned and in which educators teach learners how to teach themselves. (p. 57)

Blaschke's (2012) solution is to go beyond pedagogy and andragogy into heutagogy. Hase and Kenyon (2007) (credited with creating the term) defined heutagogy as "concerned with learner-centred learning that sees the learner as the major agent in their own learning, which occurs as a result of personal experiences" (p. 112). They also note that there are a few ways that heutagogy could be applied to learning design, including collaborative learning, student-centered learning, flexible design, self-reflection, complexity, and active learning. As all of these concepts have been tied to DS106, heutagogy will frame the discussion for what educators can take away from the unique design of DS106.

While it is somewhat unclear as to what exactly connectivism is, the general concepts behind this emerging idea can still be helpful. Just as DS106 creates a complex system of networking that allows for self-organizing, instructors and course designers can create learning designs that allow students to self-organize into groups for the purpose of navigating the chaos of unlearned content. Instead of "handing out" pre-defined knowledge, instructors could create situations where students can create connections between what they know and what they need to learn. In other words, they would not just show students how to cross the zone of proximal development, but they would allow students to network their way across. The core design of a course could shift from one of consuming knowledge passively to one of actively connecting

new information together while interacting with other students.

Closely tied in with connectivism in the context of DS106 is student-centered learning. While certain offerings of DS106 might be too learner-centered for the needs of some courses, many of the ideas would be good ideas to experiment with. Assignments banks can possibly be adjusted to almost any topic, giving students the freedom to demonstrate knowledge acquirement in an assignment product that they are most comfortable with. The benefit for students is that they would not be penalized just for lacking technical skill with the technology tool used in a specific assignment. Going further into student-centered learning by allowing students to create assignment ideas to be added to the bank would also go further into the heutagogical principles of learning how to learn. An even further step into heutagogy would be to allow students to create content and guide the direction of the course. Once again, the core design of a course could shift from one of an instructor handing out pre-set content and assessments to one of students working as co-creators of the learning process.

Even though multimedia is the core of a course on Digital Storytelling, other course topics can still take advantage of the use of interactive multimedia even if they are not specifically focused on a media-rich subject matter. Assessments and activities that have focused on one form of media (text) can be re-designed into interactive multimedia assignments. For example, students can create a video of their topic that can be posted in an online forum for other students to discuss. This topic ties back into the assignment bank idea of the student-centered learning discussion. Various forms of media and interaction will be needed to sustain a viable assignment bank.

Sociocultural theory brings to the conversation a focus on creating a culture or community rather than a course, one that is experienced by students with goals that are

accomplished rather than a series of tasks to be completed and conquered. Sociocultural theory really brings together connectivism, student-centered learning, interactive multimedia, and heutagogy in a way that creates a course community that celebrates the individual cultures that each student brings to the table. DS106 goes a step further by sometimes creating course personalities that serve as a specific culture in itself. Certainly many instructors can take advantage of this idea by finding creative personalities and designs for their courses.

### **Conclusion**

In many ways, DS106 is turning the idea of what a “course” should look like on its head. In many other ways, it is just utilizing solid educational theory that has been around for a long time. When looking at a course like DS106, the temptation might be to focus exclusively on the specific designs that are unique for this course and only work in its context. What really needs to happen is to look at the major ideas and concepts that DS106 utilizes to create a successful learning environment. Just a quick glance at the #ds106 tag on Twitter shows how involved and committed current and former students are to the course. If instructors wish to create this level of dedication and passion in their students, they could do well to see what lessons can be learned from the innovative team behind DS106.

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