Bringing a mashup of learning theories to bear on online learning:

A critical reflection

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Introduction

Most attempts at online learning... [are] based on delivering repurposed content to students via the Internet. Communication, collaboration, community and construction are afterthoughts graded onto modern correspondence courses. Despite the low-level interactivity that accompanies clicking the mouse and checking email, there is little interaction between the hearts and minds of learners (Stager, 2005, p. 3).

Much has changed since Dr. Gary Stager wrote those words in 2005, especially considering advances in Web-based information and communications technology. Yet, the premise remains the same. That is, even today, mid-2012, the rhetoric and practice of "online learning" is largely wrapped in language such as "delivery" and "instruction" and "content." Also, while teacher- and content-centric learning management systems that continue to be the dominant platform for online learning endeavors allow for some level of communication, collaboration and community, the open web affords unprecedented and seemingly unlimited opportunity. Yet, few online learning instructors have taken full advantage of those affordances and the power of educational computing.

This paper offers a critical reflection of one professor's experiences teaching multiple sections of a graduate-level online course. The first section lays out the theories of learning that drive the

instructional design, which is detailed in the subsequent section. That is all followed by the concluding

section which is a reflection and synthesis of the experiences of the professor.

Constructionism, connectivism and rhizomatic learning: A mashup of theories on learning

A move away from an online course focused on content mastery requires a move away from

instructionism. That is, a different theory of learning must be embraced. Or, multiple new theories of

learning need to be weaved together to inform a more learning- or learner-centered experience. In

the case of the online course that is the focus of this paper, multiple perspectives and theories of

learning have been brought to bear on the learning experience.

Constructionism and project-based learning

Constructionism - the N word as opposed to the V word--shares constructivism's connotation of

learning as "building knowledge structures" irrespective of the circumstances of the learning. It

then adds the idea that this happens especially felicitously in a context where the learner is

consciously engaged in constructing a public entity, whether it is a sand castle on the beach or a

theory of the universe (Papert & Harel, 1991, p. 1).

Seymour Papert is largely credited with developing constructionism as a learning theory and he

explicitly builds on the work of Jean Piaget who is widely considered the forefather of constructivism.

Where Papert diverges from Piaget's work is largely around issues of intelligence and children. Piaget

focuses on how children gradually distance themselves from artifacts and environments as they are

increasingly able to "mentally manipulate symbolic objects within a realm of hypothetical worlds"

(Ackermann, 2002, p. 6). Papert, on the other hand, sees "becoming one with the phenomenon under study" (Ackermann, 2002, p. 8) as the key to learning. That is, learning is situated and is best approached by "diving into" situations. Finally, constructionism is a theory of learning that holds that learners are particularly likely to make new ideas when they are actively engaged in making some type of external artifact…which they can reflect upon and share with others" (Kafai & Resnick, 1996, p. 1).

Where constructionism is the theory of learning, one application of that theory is project-based learning (PBL). Definitions of project-based learning are varied. However, Thomas (2000) in citing Bereiter & Scardamalia (1999), claims that "in order to be considered as a PBL project, the central activities of the project must involve the transformation and construction of knowledge (by definition: new understandings, new skills) on the part of students" (p. 4).

A growing body of research documents the effectiveness of project-based learning. More specifically, there is empirical evidence that computer-mediated project-based learning (CMPBL) leads to the attainment of goals perfectly consistent with constructivism and constructionism (Branch, 2005; Liu et al., 2006; MacGregor & Thomas, 2005; Quek et al., 2006, Wong, 2006). Mioduser and Betzer (2007) examined the contribution of project-based learning to high-achieving high school students' knowledge acquisition and problem-solving abilities. Using a quasi-experimental design, the researchers determined that compared to a control group (no PBL), the students in the classes where PBL was heavily integrated demonstrated significantly higher levels of essential learning skills: formal knowledge acquisition, technological knowledge, knowledge resources utilized, and design skills. The PBL students also exhibited a positive change in attitude towards technology and technological studies.

Connectivism and rhizomatic learning

"Distance learning is instructionist in nature. Distributed learning is constructionist" (Cannings and Stager, 2003, p. 3). Additionally, Papert asserted that knowledge is best constructed when artifacts are created and shared. If there is anything that the modern Web affords in new and nearly unlimited ways, it is sharing.

In fact, a range of critiques can be brought to bear on a system of schooling that assumes learning as individualized and that punishes and rewards students for their ability to construct knowledge on their own. One such critique is the contention that advances in technology render obsolete any theory of learning that involves the individual construction of knowledge. Specifically, "[u]biquitous learning is a new educational paradigm made possible in part by the affordances of digital media" (Cope & Kalantzis, 2007, p. 1). Furthermore, contemporary forms of computer-mediated communications and related networking technologies change the nature of learning by enabling social constructions of knowledge. Weinberger's (2008) example of Wikipedia is the ultimate representation of this collision of technology-enabled networked learning; i.e. Wikipedia represents an instance of social knowledge (i.e. it is an attempt to capture, as public knowledge, what can be observed via the interactions of numerous instances of private knowledge) facilitated by a simple technology (the wiki).

Thus, with the nature of knowledge changing from individually to socially constructed, and with the emergence of social media technologies, a new theory of learning must be enacted. Siemens (2005) offers "connectivism" as a learning theory that moves away from objective-based learning and that accounts for the networked learning opportunities afforded by the digital age. Undergirding connectivism is a view of learning as "a process that occurs within nebulous environments of shifting

core elements – not entirely under the control of the individual." According to Siemens (2005), the principles of connectivism are:

- 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.

Cormier (2008) takes connectivism a step further in the form of rhizomatic education. The rhizome is offered as a metaphor for knowledge.

the…rhizomatic plant has no center and no defined boundary; rather, it is made up of a number of semi-independent nodes, each of which is capable of growing and spreading on its own, bounded only by the limits of its habitat. In the rhizomatic view, knowledge can only be negotiated, and the contextual, collaborative learning experience shared by constructivist and connectivist pedagogies is a social as well as a personal knowledge-creation process with mutable goals and constantly negotiated premises (Cormier, 2008, para. 3).

What, then, does an online course embracing these learning theories look like? That is the focus of the next section of this paper.

Operationalizing those theories of learning in a single online course

Educational Technology for School Leaders (given the course code ADMS 647) is a fully online graduate course designed for sitting and aspiring school leaders. Students in the course are typically classroom or school-based educators enrolled in a masters or post-masters program of study aimed at achieving administrative certification. In the last few years, the course has been a required part of the program of study for a masters or post-masters degree in educational leadership, though some students are graduate students in other programs.

The course is loosely framed around the National Educational Technology Standards for School Administrators (NETS-A) in that each of the five modules is based on the five main NETS-A standards. Each module consists of 2-3 weeks of activities. The students are informed from the outset that their learning will be:

- **Collaborative** – everyone, including the instructor, learns together and takes responsibility for everyone else's learning.

- **Documented** - the processes of learning are more important that the specifics of the knowledge constructed. The learning process, therefore, is documented in the...

- **Open** - by exposing learning to colleagues and the public, students take the first steps in taking control of their digital identity and expanding their horizons as connected learners.

Towards those ends, the course is constructed through a combination of digital platforms and tools. The main course site is built in Google Sites. The collaborative authoring nature of Google Sites allows for the course site to be in constant development. The basic structures and core descriptions are built into the site initially, but students build parts of the site over the course of the semester. Posterous, a blogging service, is used as a discussion space. A Diigo group serves as a clearinghouse of information and resources the students curate for each other. All of those spaces are open and public,

though a listserv is established should the students wish to address the other students by email in a "safer" more private space. Finally, students are encouraged to utilize Twitter, though they are not mandated to have an account or use the microblogging service.
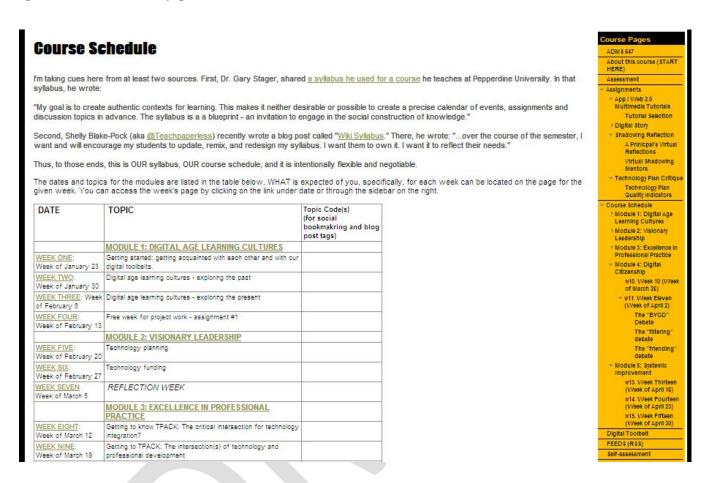
Figure 1. The homepage of the ADMS 647 course site.

In the first weeks of the course, students are expected to gain familiarity and comfort with their "digital toolbelts." The first module is all about scaffolding their technological literacy so that the students gain confidence in using the tools that they will use throughout the semester, but also so they can gain a sense of the possibilities for educational technology. By the end of the first module, students are expected to build a multimedia tutorial page of a Web 2.0 tool/service/app. This causes them to learn about a tool, learn how to write to the web, and results in a collection of tutorials from which the whole class can learn. This scaffolding of technological literacy and awareness is necessary as the focus

of the course moves to substantive leadership issues such as technology planning/funding, legal/ethical issues in educational technology, etc.

Figure 2. The course schedule page of the ADMS 647 course site.

The remaining modules are more leadership-focused, though the instructional design remains consistently focused around connectivism and constructivism. For the latter, students are regularly asked to locate relevant resources, share them through the Diigo social bookmarking group and reflect on what they encounter by posting to the course blog. All of these spaces are public and open allowing for connections to relevant individuals and resources. For example, from time-to-time, the professor invites relevant Twitter followers to comment on student reflections on the blog. Students can comment on resources shared in Diigo within the group, and are also asked to comment on each others' blog posts as they feel moved to do so.

Also built on connectivist learning principles, students are assigned a virtual shadowing project wherein they are asked to "follow" any number of educational leaders on Twitter, on blogs and in other forms of social media. Students are given a list of 20 educational leaders who are active on social media that they can follow or shadow virtually. They are encouraged to engage with these educational leaders with the hope that they will then connect with other educators within the online networks of these leaders.

Constructionism runs through much of the course as well. Students build the multimedia tutorials at the end of the first module. For the virtual shadowing project, they are given a choice of how to submit their reflections. Some choose to build a multimedia page on to the course site, some send a compilation of resources via OneNote and/or Evernote, and still others offer a reflection in video form. Finally, for the final course project, students must complete a digital storytelling project which asks them to create a 5-minute multimedia narrative reflecting their visions of school leaders of the 21st Century.

In other words, all throughout the course, students are expect to connect, share, synthesize, reflect, and create. There is very little content delivery and no formal assessment. This can be a bit disarming for the adult learners in the course. The final section is a critical reflection of that experience.

A critical reflection

At the outset, it is important to note that many, maybe even most, of the adult learners in ADMS 647 successfully adapt to the experience and the expectations. They "do well" and report positively on the course via the formal course evaluations. Of the course, one student wrote, "All the new knowledge I have now about technology, technology in schools, and technology as a powerful resource for

school leaders... I think this course made me reevaluate my whole view about technology and get totally excited about it." Yet, another student wrote, "The course was so disorganized and unpleasant that is really hard to think about something positive." Positive comments like the former quote are more common than the latter, and, overall, the aggregate ratings in course evaluations are reasonably high. However, the ratings are weighted down by those students who clearly struggle through the course. What follows is a critical reflection on why the course as designed and implemented does not work for all students.

"Schooliness" and the "Apprenticeship of Observation"

An important consideration for this reflection is that the graduate students in this course are almost all educators working full or part-time in an educational setting. They are adults who have been through elementary school, secondary school, college, and varying amounts of graduate school. These are adults who have experienced all of that formal schooling and who have in many, if not all, cases proven quite successful at school. They have successfully navigated the journey and succeeded at playing the game of schooling. As a course in a program of study, ADMS 647, to some degree, attempts to change the rules of that game.

Burrell (2009) trademarked the term "schooliness," a bit of riff on the word "truthiness" which was coined by comedian Stephen Colbert and which won the Word of the Year awards from the American Dialect Society in 2005 and Merriam-Webster in 2006. Burrell never really fleshes out a formal definition of schooliness, but he nods to the ways in which school is enacted without reflection and absent authenticity. "Schooly writing"assignments, he writes, are "Assignments by teachers who don't want to read them, to students who don't want to write them; a perpetual and unnecessary misery upon which hinges the student's future, and the teacher's present, livelihood; an oxymoron." Schooliness, it seems, embodies all of our conceptions of how school is enacted; it's what we've always done in and with formal schools.

Lortie (1975) wrote about the "apprenticeship of observation," the idea that sitting and aspiring educators have essentially served an apprenticeship in teaching simply by having been students for so many years. Lortie wrote that "the average student has spent 13,000 hours in direct contact with classroom teachers by the time he [sic.] graduates from high school" (p. 61). Add in the college years, and in many cases, graduate coursework, and teachers have been deeply socialized in ways that "serve to perpetuate traditions at the expense of reflective and informed change" (Schempp, 1987, p. 2). This socialization often proves impossible to overcome for professors of education determined to prepare reflective and innovative educators. In other words, before teachers are ever given a classroom of their own, they are deeply socialized into schooliness.

The educators who enroll in ADMS 647 bring that same socialization to their role as graduate students. They come to the course expecting to be told what to read, to discuss what they've read with other students, to write papers and to take quizzes and exams. When the course does not play out that way, and students are asked to share, to create, etc., the socialization pushes back.

As one example of how this socialization works against the instructional design of ADMS 647, consider the issue of how learning time is apportioned. For almost all of the graduate courses the ADMS 647 students take, the class meets once per week for 2.5 to 3 hours. Given the typical instructional design of the course, and the way it is scheduled, students typically attend to the out-of-class work in large chunks of time. Furthermore, this tends to happen the day or night before the next class meeting. Also, for graduate students who work full-time during the week, students like to use weekends to do their work for class. So, for a course that meets on Monday evenings, students typically block out a window of time on Sunday to do what needs to be done before class meets Monday night.

In an online course such as ADMS 647, there are no synchronous meetings. If the expectation of a student in a face-to-face course is that students will do 3-4 hours of work outside of "class," in addition to the 2.5 to 3 hours of "seat time," then a student in a fully asynchronous online course might fairly be expected to commit 6-7 hours per week of time to the course. What happens, though, when the instructor asks the students to apportion their learning time differently than a typical face-to-face course? Is it fair for the instructor to ask the students to commit to, in a given week, an hour per day or 2 hours over 3 or 4 days during the week? This becomes particularly sticky around online discussion spaces. If one expectation of students is that they will engage in online discussions, posting to a discussion board or a blog the night before the course moves on to another topic does not promote discussion. Students move on to the next topic of the course before they ever have a chance to comment on each others' posts.

Instrumentalism

Another potential barrier to success for ADMS 647 students is more explicitly attitudinal. That is, while the socialization of schooliness is something of a psychological block, there is another mental block that can be a hurdle to success for students in ADMS 647. Jaffee (2012) writes about "instrumentalism" as a barrier to learning for postsecondary students.

> If there is one student attitude that most all faculty bemoan, it is instrumentalism. This is the view that you go to college to get a degree to get a job to make money to be happy. Similarly, you take this course to meet this requirement, and you do coursework and read the material to pass the course to graduate to get the degree. Everything is a means to an end. Nothing is an end in itself. There is no higher purpose (paragraph 4).

ADMS 647 is usually taken by educators as part of a program leading to administrative endorsement. For many of the students, it is a required course in the program sequence.

As much as one might wish or imagine that educators in a graduate program of study are deeply committed learners, instrumentalism is potentially an issue for all professional graduate programs. In any graduate course, course enrollment as a means to an end can be a problem for the instructor. However, ADMS 647 is specifically designed with effort as the primary expectation. On the page of the course site describing the course, the instructor writes, "My main expectation is for you to learn and learn hard. As Dr. Gary Stager writes, *"Let your personality shine and most mportantly, **HAVE A GO!** Be present, take some risks, stretch yourself."* It is not hard to see how this expectation conflicts with an instrumentalist attitude. The combination of instrumentalism and the socialization of schooliness is a potentially toxic mix for students in a course like ADMS 647.

Technological Literacy as a Multidimensional Construct

The effect of the level of technological literacy that students bring to the online learning experience has been systematically investigated, with mixed results. Some researchers claim that computer skills have little or negligible impact on student success in online courses (McIsaac, Blocker, Mahes, & Vrasidas, 1999; Rumprapid, 1999). Yet, other researchers found that technological literacy is essential to student success in online learning (Erlich, Erlich-Philip, & Gal-Ezer, 2005; Jameson & McDonnell, 2007; Martz & Reddy, 2005, Shih, Munoz, & Sanchez, 2006; Summers, Waigandt, & Whittaker, 2005). It is notable that the "no effect" research is generally found in earlier research, whereas more recent research tends to find that students' level of technological literacy is related to success in an online course. In a recent study, Rakap (2010) concluded that for adult students "there is a moderate positive correlation between computer skills and students' success" (p. 108).

Throughout the body of literature on students' prior technology skills, the emphasis tends to be on capabilities. That is, technology literacy is typically seen as merely a set of skills; i.e. what students are able to do with technology. However, technological literacy is much broader than that. The International Technology Education Association (ITEA) defines technology literacy as the ability to "use, manage, assess and understand technology" (2000/2002/2007, p. 9). Similarly, the National Academy of Engineering (NAE) and National Research Council describes technological literacy as encompassing "three interdependent dimensions – knowledge, ways of thinking and acting, and capabilities" (Pearson & Young, 2002, p. 15).

Prior research on student-level predictors of success in online learning has focused almost exclusively on the capabilities aspect of technological literacy. However, the "ways of thinking and acting" dimension is critically important to consider for a course such as ADMS 647. The adult students in ADMS 647 bring varying levels of technological literacy to the learning experience, especially when considering technological literacy as a multidimensional construct. Some of the adult learners have very few technological capabilities and limited technological knowledge; they can "do" email, but they know how to do very little else with a computer. For that reason, within the first module of the course, students are given time to equip themselves with the digital toolbelt they will need to be successful in the course. An effort is made to scaffold the learning as tools are slowly added in to the course. Also, students are explicitly encouraged to tinker with the technology.

Ultimately, though, many of the students who enroll in ADMS 647 are limited in the "ways of thinking and acting" dimension of technological literacy. This is exhibited in at least a couple of ways. First, many of the students do not have the digital habits of mind and digital dispositions to fully take advantage of the way ADMS 647 is designed. They might be equipped with various digital devices, including smartphones and laptops, but they are not in the habit of using those devices for learning.

They don't regularly "go online" and only do so to check in on the course. They are not experienced in using hypertext. They do not know about tags in Diigo and on blog posts. These are little habits that add up to a big obstacle.

As a second indicator of technological literacy, many of the students lack basic awareness of what is possible. As one example, the Posterous site that serves as a discussion space is mobile optimized, but most of the students lack the awareness that it is even possible to access the site on a mobile device. Additionally, Posterous and Diigo are two major services integrated into the learning experience. Using those services is quite easy; in fact, they are selected by the instructor for that very reason. But, use of those services can be further simplified by the use of browser plugins or extensions. The Google Chrome extensions made available by those services make utilization nearly as simple as one-click. However, many of the students use Internet Explorer, do not even know that Google Chrome exists, and have no awareness of how to upgrade a browser with plugins or extensions.

CONCLUSIONS

For universities seeking increased enrollments and, therefore, revenue, and for students with an instrumentalist orientation to postsecondary education, online learning can be an easy and efficient means to those ends. Universities can easily deliver content to students whose mastery of said content can be assessed quickly. The "learning" can be "managed" through "learning management systems." These systems require very little technological literacy on the part of the instructor or the students.

However, the real promise of the modern web is what it affords learning that is more open, distributed and authentic. Facilitating the communication, collaboration and community that Stager (2005) calls for is not easy, but much more doable than even five years ago. It is not easy for the professor, and it can be complicated for the students, especially adult learners who have been

socialized into schooliness. An online course designed around principles of constructionism, connectivism and rhizomatic learning can be a shock to the "system." For everyone involved in a course like ADMS 647, there is an amount of "unlearning" that needs to happen. In 2007, Richardson wrote about the "steep unlearning curve":

> One of the most challenging pieces of figuring out how to move education forward in a systemic way is "unlearning curve" that we teachers and educators have to go through to even see the possibilities that lay before us. So much of our traditional thinking about personal learning and classroom practice is being challenged by our ability to publish and connect and collaborate primarily because of the opportunities afforded by the Read/Write Web. For instance, in a world where literally any place can be a classroom, we have to unlearn the comforts of four walls that we've become accustomed to.

Richardson then offers an example of what the open web affords: "When we can share our work with wide audiences, we need to unlearn the idea that student writing and projects are simply ways to assess what they know."

Institutions of higher education are grappling with online learning, and traditional institutions are trying to find their place amongst a landscape populated rather liberally by for-profit and even non-profit institutions with no bricks-and-mortar presence. This landscape is also becoming fertilized by free online courses offered by the likes of Harvard and MIT. These are wild times for sure and the horizon is barely visible.

In a recent essay called "A 'Place' for Higher Education," Weitzer discusses the important of "place" in higher education and argues that at a time when traditional bricks-and-mortar institutions are figuring out their "place" in the quickly evolving landscape of higher education, the campus can still

be an important place. As a counterbalance to the proliferation of online learning, Weitzer asserts that "[a]s institutions review and revise their strategic plans and determine how to best market themselves, they should carefully consider how to enhance the campus experience as a space where people come together in ways that they cannot in cyberspace (or at least not yet)."

This is wise counsel, but universities should also carefully consider the "spaces" they create for learners in cyberspace. The physical spaces do not have to be so different from the digital spaces; they can, and probably should, blend together in ways that constitute a coherent sense of community. This requires being planful and thoughtful about the theories of learning that inform the online and face-to-face learning experiences. This is the real value proposition for "traditional" institutions of higher education.

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