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A comparison of Web 2.0 tools in a doctoral course

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ABSTRACT

Adult, professional students in a doctoral-level course used Web 2.0 tools such as wikis, blogs, and online discussions to develop answers to six "Big Questions" related to higher education finance and also produced a research paper that used original data or the research literature to improve understanding of a specific topic. At the close of the course, students were asked to provide examples of learning for each question and each tool, and to evaluate the tools used. Bloom's Digital Taxonomy was used to evaluate levels of learning. Results indicated that the level of learning mirrored that of the Big Question or was at higher levels when students used new tools. Wikis generated objections from students who did not care for group work, although others found it a good collaborative tool. Blogs were more acceptable, but online discussions were preferred because of the interaction and sharing among students. Research papers allowed students to learn material of their own interest and to do so in depth.

1. Introduction

With all of the attention paid to Web 2.0 tools these days, it is important to both explore their uses and evaluate their effectiveness in supporting student learning. This study was based on a doctoral-level course conducted during Fall 2009 that used wikis, blogs, online discussions, and the traditional research paper as vehicles for student learning. Students were asked to evaluate their learning which is combined with the instructor's evaluation of the class outcomes to develop some tentative conclusions and guidelines for use of these tools in the future.

2. Literature review

2.1. The case for Web 2.0 and useful theories

Given the interest in new tools, it is not surprising that Web 2.0 tools have been touted by many (Godwin-Jones, 2003; Beldarrain, 2006), applied to specific disciplines such as Sociology and Writing (Beer & Burrows, 2007; Cummings, 2009, respectively), debated online (Fischman, 2009), and claimed to have disruptive powers which will transform academic journals (Cope & Kalantzis, 2009). McGee and Diaz (2007) provided advice to faculty and institutions on which Web 2.0 tools to use based on knowing the needs of faculty, programs, students, understanding the challenges and support requirements of different tools, and evaluating the learning and tool after implementation. Why might these authors be enamored of the Web 2.0 world?

Two theories or explanations seem to provide a foundation for the rapid support and dissemination of Web 2.0 tools. In both theories, learning is characterized in ways that are counter to many perceptions of how it occurs: the lone reader or thinker who contemplates knowledge separate from and perhaps even distant to the real world. Wegerif (1998) and Rovai (2007) have documented that learning increased when students in online courses were able to increase their interaction, communication, and community with other students. Social learning theory (Bandura, 1977) posits that students learn when they are able to interact, collaborate, and cooperate in their learning. This explains, in part, the interest in Web 2.0 tools like wikis and blogs that depend upon student groups working together on educational projects. Brown, Collins, and Duguid (1989) argued against the perception that knowledge is separate from the real world by researching how cognition occurs in everyday activities. They conclude that "knowledge is situated, being in part a product of the activity, context, and culture in which it is developed and used" (Brown et al., 1989, ¶1). Tools are understood only through their use and uses, rather than through some abstract conceptualization of their characteristics. This means that Web 2.0 tools are best understood by evaluating what students learn through their use in education and not through discussions of the possibilities of these tools.

2.2. Wikis

Wikis have been touted as a collaboration tool that draws on the input of many individuals to craft a single product. Rather than review publications that advocate use of the wiki, let us focus on the research that has been conducted so far on the use of wikis in educational settings. Bold (2006) used wikis in a graduate-level class and increased cooperative learning by assigning the development of

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collaborative web pages. The wiki project met little resistance from students, helped students to feel connected in their online courses, but they still wanted more interaction with others. Chao (2007) used wikis in a software engineering class for projects. When asked to evaluate their wiki experience, students used the wiki regularly in the project (89%), found it easy to use (86%), easy enough for non-technical users (89%), and a good tool for collaboration (89%).

Raitman, Augar, and Zhou (2005) surveyed students in online courses that used wikis and found that 90% of those responding were satisfied and 10% were unsatisfied with the experience. Positive comments about the wikis were their convenience and accessibility anytime, their editability which seemed to increase ownership over the final product, and their democratic nature which built on opinions and research by many students. As for negative comments, students felt wikis were impersonal, did not allow discussion, would lose their work and affect their grade, and could not be edited by several students simultaneously. Wang and Turner (2004) used wikis in computer science courses and identified a problem with the wiki software. While it permitted multiple students access to the page at one time, only one individual could insert their work, causing distress to the students whose work was lost. They recommend that the software alert users when multiple students are working on the wiki at the same time and to give the first student who has logged on a timeframe for completing changes so that others need not be locked out of the process. It will be interesting to see if the students in this study identify similar positive and negative experiences, from better collaboration to problems with editing the wiki.

2.3. Blogs

Blogs have exploded in use. There were 83.1 million blogs in May 2007 (Baron, 2008) and the number had risen to 133 million blogs by January 2009 (Singer, 2009). In 2007, 175,000 new blogs were added each day (Baron, 2008). And while educators seem to have adopted the use of blogs for class assignments, few studies have been completed on educational uses of blogs. What are more common in the literature are personal testimonies (such as Wiley, 2009), but fewer studies. Williams and Jacobs (2004) recorded their experiences using blogs to support learning in a graduate school of business. Ladyshewsky and Gardner (2008) used blogs in an undergraduate course as a means for students to discuss professional practice and current research. They found that the blog heightened learning and helped students integrate theory into practice. Watrall and Ellison (2006) conducted focus groups with students who used blogs as part of their coursework and students liked the fact that everyone had a voice, they could write more naturally, they valued reading the view of other students, and they appreciated gaining access to new material. Farmer, Yue, and Brooks (2008) conducted a case study of blogging in an undergraduate liberal arts course. While 96% of the students made at least one entry, half of the students made 11 or more entries. The importance of posting was confirmed for students when early posts garnered comments from others, which kept the conversation going. In some cases, an accomplished writer would offer an idea that would "take off and spread throughout the class as a self generating discussion" (¶22).

One consistent thread throughout these studies is the tension between the students' need for more detailed guidelines for the blog assignment and the instructors' desire to encourage independent and creative thinking in students. This seems a situation that is difficult to judge until instructors have more experience in using blogs and find ways to make their use meaningful for students rather than an exercise to be fulfilled.

2.4. Online discussions

Online or threaded discussions have been in use for a decade, and therefore a larger body of research literature exists that examines how to use them, what they accomplish, and how to evaluate them. Bender (2003) is a good example of the type of advice given to faculty entering the world of online discussions and Moore (1993) typical of early advocates who claimed that they would decrease psychological and communication distances among students and instructors.

The research on online discussions soon claimed a number of advantages to their use in online and hybrid courses. They increased collaboration (Curtis & Lawson, 2001), a sense of community (Palloff & Pratt, 1999), depth and higher-order thinking (Garrison, Anderson, & Rourke, 2001), interaction (Rovai, 2007), think time (Aviv, 2000), reflection and time on task (Meyer, 2003). Rovai and Barnum (2003) were critical in arguing that increased and active interaction was a significant predictor of students' perception of learning and interaction increased when the topics of the discussion were authentic and meaningful to the students (Rovai, 2007).

Many authors have proposed various evaluation schema suitable for analysing the learning occurring during or as a result of online discussions. Fahy (2003) used a Transcript Analysis Tool to analyze support strategies, Aviv (2000) developed performance profiles, Rovai (2007) developed a discussion rubric, and Spatariu, Hartley, and Bendixen (2004) proposed interaction-based coding. Meyer (2004, 2005) has applied Bloom's taxonomy to several studies of online discussions, which has the advantage of being easily understood and applied. A Bloom's taxonomy revised for use in digitally-supported education was used in the current study and will be discussed in greater detail in a later section.

2.5. Comparison studies

What are even rarer are studies that focus on comparing the use of two Web 2.0 tools. Gao and Wong (2008) asked graduate students in educational psychology to compare their experiences with a wiki and threaded discussions. Students found more focus, depth, flow, idea generation, and enjoyment in the wiki than in the online discussion. More studies like this are needed that add to our understanding of individual tools with carefully designed comparisons of different tools using a variety of measures. In this way, we can begin to ascertain differences that will help instructors apply the right tool to the right learning goals.

2.6. Research papers

Walker, Golde, Jones, Bueschel, and Hutchings (2008) have argued that doctoral study depends upon an "intellectual community... [that] advances knowledge, ideas, and the formation of scholars" (p. 127). Different disciplines often have different practices to accomplish this end, but learning how to prepare publishable research papers are nearly ubiquitous. Therefore, a common and necessary preparation of scholars requires becoming familiar with the research and theoretical literature in the field being studied, which is likely why research papers—those papers assigned on the first day of class and due on the last day of class—are *de rigeur* in graduate school. Class by class and paper by paper, the student builds their knowledge of prior research, preceding theories, and the names of authors prominent in the field. They also learn to prepare papers that are well-reasoned and documented as well as cogent, convincing, and creative. They learn to write for academic journals and prepare to make their own unique contributions to the literature.

Through repetitive assignments such as the research paper, graduate students are subtly shaped into disciplinary norms, including a preference for building on what has gone before, documenting ideas, and reasoning and writing with skill. However, given recent criticisms of doctoral programs (Nerad, 2004; Nerad & Cerny, 2000), it is fair to question whether our intentions actually result in enhanced research skills and knowledge of graduates.