blogs and wikis: ICT tools to facilitate critical thinking and learning in a web-based health services and information management curriculum

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Blogs and wikis are popular social media technologies that facilitate collaboration and communication. Beyond their popular appeal, they can help to facilitate critical thinking and learning in the post secondary learning environment. This chapter will consider how such technologies are being used to support collaborative learning as well as the development of critical thinking in the health services and information management curriculum in the college of allied health sciences. First, an overview of each technology will be offered including a general discussion of how it is used in post secondary online education to support learning. A specific description of how these two social media technologies were adapted for use in undergraduate as well as graduate courses within the department of health services and information management in the college of allied health sciences will follow. Finally, an argument will be made concerning how the inclusion of blogs and wikis facilitate the development of critical thinking in post secondary learners in web based learning environments.

Keywords blogs; wikis, ICT tools; web-based; health services management; health information management; critical thinking

Blogs and Wikis

Blogs, a contraction of “Weblog” or “Web log,” have been appearing online at a daunting pace. A recent Pew investigation reported that 8.4 million U.S. adult Internet users have created a blog or an isomorphic Web-based diary. The readership of blogs reached 77 percent (346 million) of Internet users by January, 2009 (http://thefuturebuzz.com/2009/01/12/social-media-web-20-internet-numbers-stats). Apart from the sheer number of blogs online, the immense impact of blogs was also embodied in their emerging role as grassroots journalism compared to the traditional mainstream media, especially after the September 11 terrorist attacks, during the Iraq and Afghanistan wars, the 2008 presidential elections, and the popular uprisings in the Middle east. A blog is a small Web site whose home page contains time-stamped user inputs called posts, usually in text format. Posts are usually listed on the blog in reverse chronological order with the latest at the top of the home page. Blogs also share many other features:

- Old posts often are archived periodically into separate Web pages with links on the home page.
- Readers of a blog are able to comment on a specific post through a Web interface. All comments are accessible to other blog readers as well.
- Bloggers (people who write the blog) usually embed links to the original online information source about which they write the post. Sometimes other multimedia files—images, audio clips, or video clips—are also embedded in the posts.
- If a blogger writes a post regarding a post on another blog, an online Track Back mechanism can be used to notify the original blogger about the reference. Readers of the original blog, therefore, can follow the Track Back to read the concomitant blog.

The first blog on the Web arguably is the Robot Wisdom Weblog created by Jorn Barger in 1997, as he coined the name “Weblog” for his blog. Others believe the online diary format can be traced back to the inception of the Web. Despite these arguments, the number of blogs on the Web did not start to increase exponentially until the year 1999, when the first Web-based, free, and user-friendly blog management system, named Blogger, was developed by Pyra Labs, which was later acquired by Google. In short, blog management software is a server-side program with a Web-based interface that allows ordinary Web users to immediately publish their blogs online. Before using a blog management system, users needed to have substantial Web programming skills to publish their blogs online. With a blog management system, users can publish their writing on a blog by clicking just a few buttons.

Nardi and colleagues summarized motivations for blogging in an ethnographic study conducted at Stanford University. Although the identified motivations are neither exhaustive nor mutually exclusive, they may explain the motivations behind most blogs:

- Some bloggers use their blogs as a medium to record their lives. These bloggers consider blogs their online personal diaries to share with their friends or the public.
- Some bloggers use their blogs to comment on current events or news. They express their personal opinions on events with the help of the immediacy of blogging. This type of blog is often referred to as punditry.
- Some bloggers use their blogs to express their feelings, thoughts, or ideologies. Many of these bloggers are grassroots social activists who want to have their voices heard by the maximum audience.
• Some bloggers use their blogs as a publishing platform to construct intellectual artifacts such as drafts of journal articles. Some of them share their thoughts on their blogs and invite their colleagues to provide critiques through the comments. In this manner, blogs become a channel for intellectual exchange.

• Some bloggers use their blogs as an online forum for a particular group. Each group member can post and comment on others’ posts to share information or exchange thoughts. Many blogs used in higher education, like the one in this study, fall into this category of motivation. Students and instructors post and comment on a blog as a way to foster group learning.

Instructors in higher education have found that blogs, especially group or community blogs, can be adopted for pedagogical purposes, especially for online courses. Many instructors have used their blogs as the entry page of their online course. Others have encouraged or mandated their students to contribute to course blogs. Some universities have deployed blog management systems to allow their students to create and manage their own blogs. A well-known one is the blog management server at Harvard Law School. Some administrators in higher education have acknowledged the efficacy of blogs to help students manage their academic work and to encourage critical thinking and writing. These administrators have deployed computer systems on campus called e-portfolios, which are blog management systems tailored for higher education. E-portfolios allow students to write about their academic and extracurricular activities and share their activities with their advisors.

Ward Cunningham coined the term wiki on March 25, 1995, when he started his Web site Cunningham & Cunningham (c2.com) using the software WikiWikiWeb, developed by himself. Since then, many wiki tools have been developed and used in a variety of knowledge-sharing projects. Wiki is from the Hawaiian word meaning "quickly" and "informally," which highlights the strength of the software. Anyone with a Web browser and an Internet connection can collaboratively edit a document on a wiki server.

Popular usages of the wiki tool include repositories of programming documentation, massive online encyclopedias, and tools for corporations to share content and information both inside and outside of their organizations. One such example is the Web site InnoCentive (www.innocentive.com), which provides a online platform on which companies collaborate with external scientists to solve their research and development challenges.

Many educators have started to experiment with wiki tools for their online teaching. For example, Farabaugh (2007) used two different wiki tools (QwikiWiki and Mediawiki) in her courses on Shakespeare for writing assignments and directed reflection on language. She found that wiki software is an ideal platform for completing short (rather than long) writing assignments, extending group work outside the class by continuing it asynchronously on the wiki, and enabling students to structure their discussion on their own. Other early adopters have similar findings of the usage of wiki for educational purposes. Wiki are also being used at the University of MD in a variety courses such as, mathematics, animal and food science, communication, English as a second language, accounting and management information systems, foreign language and computer science. Instructors elected to include wikis in order to facilitate collaborative e-learning among students in class projects that involved creating a course handbook in computer science and by providing a workspace for developing draft versions of a final class presentation. Wikis in these courses provided a central clearhouse of information to support learning without overloading voicemail and e-mail systems.

**ICT tools in health services and information management**

Because the majority of students who enroll in health services management (HSM) and health information management (HIM) programs are distance education students, the health services and information management (HSIM) department in the College of Allied Health Sciences (CAHS) at East Carolina University (ECU) offers online web based sections of its undergraduate and graduate courses in order to meet the needs of this student cohort. Online students often reside at different locations. Therefore, in order to provide the same level of interaction and communication found in its face to face course sections, HSIM faculty decided to use ICT technologies such as blogs and WIKIs in some of their course offerings.

The next 2 sections describe how blogging and Wikis were used in 2 specific departmental course offerings.

**The use of Blogs in a graduate level course**

A course blog was used as a class forum for COHE 6000, a graduate level course in health care systems and problems, offered by the HSIM dept. The course is a first semester introductory study of the US health care delivery system with approximately 35 students in the class. It is an asynchronous online course that serves as a prerequisite for MBA, MPA and graduate certificate students in the health care administration and health informatics tracks. It introduces the graduate student to the organization and functions of the US health care system and taught as a 5 week block course during the summer. The graduate school at ECU includes a research skills requirement under its academic regulations. Furthermore, graduate masters degree programs contain a thesis requirement. It is imperative, then, that students get as much practice as possible in learning how to make written arguments that include clear and concise thesis statements.
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The use of Wiki in an undergraduate level course

A course wiki was used as a means to facilitate group work on a term/semester assignment in HIMA 3118, a second semester undergraduate pathophysiology course for students in the health information management and health services management programs in the HSIM dept. Approximately 80 students were enrolled in 3 sections of this course. Most of the students took the course as distance learners and in order to facilitate interaction, communication, and peer learning all 3 sections were taught asynchronously and on line via the Bb9 learning management system.

The goal of the course is to develop health services and information management professionals able to communicate with physicians and other members of the health care team about patient records, patients, research, quality assessment, utilization review, risk management, and the health information systems in their facilities. This course is designed to give students the following tools in order to facilitate such interdisciplinary communication: a working knowledge of medical terminology; an understanding of the basic pathophysiologic principles of disease; an introduction to the fundamental diagnostic and therapeutic modalities, including pharmacotherapy, utilized in clinical medicine. The course includes an integrated study of the language of medicine, pathophysiology, and the diagnostic and treatment modalities utilized in clinical medical practice.

Students must complete a final course project where they apply the didactic knowledge that they have acquired. This assignment for HIMA 3118 is dubbed “grand rounds”, a ritual of medical education and inpatient care, where the medical problems and treatment of a particular patient are presented to an audience consisting of doctors, residents, and medical students. The presentation consists of two main parts: an explanation of the medical disorder/disease entity; and the medical problems and treatment of a particular patient are presented to an audience consisting of doctors, residents, and medical students. The presentation consists of two main parts: an explanation of the medical disorder/disease entity; and a report on how the patient presented and what was done for the patient. Because this meeting is for teaching purposes, usually the entire medical staff at the health care institution is present. Therefore, the grand rounds meeting takes place in a Wiki platform, the virtual grand rounds setting for this exercise.

Students in HIMA 3118 are randomly assigned into groups of approximately 5 and work in Confluence, an enterprise Wiki designed to allow teams to collaborate, create, share, and discuss ideas. Confluence (version 2.2.10; Atlassian; San Francisco, CA) was used for this assignment because it provides a more controlled environment for online collaboration by having distinct groups. Additional features include an intuitive Web interface, a powerful structuring and searching tool, PDF export, automated factoring, and open application programming interface (API) for extension and integration. Furthermore, the Confluence software is supported through the Academic Outreach Service in our university. The online course content management system used in our university is Blackboard 9. Because the
Confluence system is not linked to the university directory service, each student needs to have a Confluence username and password other than their Blackboard username and password.

Groups contact the instructor for approval of their grand rounds disease topic and then organize themselves according to work assignments in order to produce a final grand rounds PowerPoint (ppt) presentation uploaded to their group WIKI page. The ppt presentation included the following information: history of the present illness and significant past history, relevant review of systems for the patient case; summary of the patient’s course under care (include a description of what was done to and for the patient and how the patient responded); the patient’s medical diagnosis; synopsis of the disease’s etiology/pathophysiology; diagnostic tests (labs, imaging, etc.) utilized in making the diagnosis; the patient’s treatment regimen, such as any medications, surgical interventions, or other therapy used in the treatment; the patient’s prognosis. For example, this includes a discussion of the associated complications that can affect morbidity and/or mortality for a patient with this particular disease. Finally, the report should include a segment about the "latest and greatest" findings or developments either in the diagnosis, treatment and/or in the understanding (pathophysiology) of the chosen disease/disorder. The ppt format was selected because students are familiar with its use and because multimedia files can be incorporated into the presentation package.

Students as well as the instructor can post questions and comments to the groups’ wiki ppt page. This feature of the wiki helped to simulate the participation of the attending preceptor physician and other medical community members who attend grand round conferences. In addition, the instructor used the Confluence site in two specific ways. First, the front page of the Web site could be used as a bulletin board to distribute announcements and or instructions to the students. Students could comment on the announcements so the instructor would get prompt feedback. Second, the instructor could collaborate with each group by commenting on their progress and modify or even contribute to their work. For example, this feature allowed students to learn from the examples provided by the instructor without overwhelming e-mail exchanges.

The quality of the final grand rounds ppt presentation was judged by its informational content as well as by how well it presented that content. For example, the clarity of the writing and the appropriateness of multimedia in the support of the message were important criteria in evaluating a group’s grand rounds ppt file. Each individual in the group was expected to share responsibility for monitoring commentary and questions to their group’s page. Therefore, each individual group member was also allotted points for monitoring posts to their group’s grand rounds ppt page. Finally, students were also assigned points for posting questions and comments to their peers’ presentations.

Benefits of blogs and Wikis

Blogs make it possible for students who are afraid of public speaking to participate in discussions. More importantly, blogging obligates students to take the time to organize their thoughts before they post them online. Blogs are inherently an excellent platform for intellectual exchange online. They encourage students to publish online without sophisticated knowledge of Web programming. This immediate publishing feature of the blog offers opportunities for students and instructors to write online whenever they feel the urge. The comment function of the blog also creates the atmosphere of an online community for all the participants. As Nardi and colleagues pointed out in their study, comments on blog posts make the bloggers feel admired, and the commentators feel as though they are contributing. Moreover, because of relatively minute posts and consistent updates of the blog, blogging is perceived as more dynamic than maintaining a personal or course Web page. In the case of the health care system blogs for the COHE 6000 course, blogs served the real and valuable purpose of providing the most current information about a particular health care delivery topic as well as serving as a forum where students could share their informed opinions about a specific topic.

In addition to the benefit of peer learning, students might work more carefully on their course work to avoid embarrassment if they know their work will be viewed by not only the instructor but also their fellow students.

The majority of the blogs on the Web are text based with hyperlinks to the original sources on the Web as evidence. More rich-media-based blogs are now appearing on the Web. Some bloggers in COHE 6000 used embedded images and sound files in their posts to support their thesis argument. Rich media have been proven to enhance online learning experiences for the “Net generation.” Providing course content in different media formats may also accommodate students with different learning styles.

The wiki in the HIMA 3113 course was used as a workspace for group members to draft and revise their final project presentation. This approach facilitated peer learning because of the openness of the wiki. Using wiki as a peer learning workspace, students can view others’ work and the instructor's feedback as well. This feature may bring peer learning to a higher level than is possible in the traditional face-to-face setting. Another benefit of using wikis is that the instructor can follow who updates and participates on the site. Previously in group projects, instructors relied on the students to participate in the project. Instructors did not have concrete evidence of the amount of input from each student. Instructors relied partially on students’ complaints or praise of the members within the particular group. The wiki system keeps all the postings for future reference. Thus, using a wiki site such as Confluence in group projects, the instructor has evidence of each student's participation and input. This makes the final grading objective and transparent.

To the instructor, wiki is a cost-efficient way to advise the maximum number of students online. Students in the same group will be able to learn from the instructor when he or she updates the writings on the wiki server.
Blogs and Wikis facilitate the development of critical thinking in web based post secondary learners

Researchers argue that Web 2.0 technologies such as Blogs and Wikis are designed to bring diverse individuals and groups together in the pursuit of social learning opportunities26.

For example, wikis can be created, shared and edited among multiple users; while blogs can be created by individuals and then shared with a community of readers and learners. As a result, these powerful technologies present an ideal opportunity for promoting social peer learning in student groups. Peer learning is an important pedagogical component in higher education27. In the traditional face-to-face classroom, students learn from others when instructors answer questions from students or comment on their work. Many course management systems overlook the importance of peer learning with limited built in functions for such activities. The consequence is that instructors have to manage many “one-to-one” relationships instead of a “one-to-many” relationship as in the traditional classroom. Learning and collaborating in a group setting might oblige students to work more carefully and be more critical of their work output in order to avoid embarrassment if they know that their work will be viewed by not only the instructor but also their fellow group members. Therefore, peer learning settings can be effective environments for promoting critical thinking skills.

Critical thinking is the intellectually disciplined process of actively and skillfully conceptualizing, applying, analyzing, synthesizing, and/or evaluating information gathered from, or generated by, observation, experience, reflection, reasoning, or communication, as a guide to belief and action28. It is basically the ability to carefully evaluate and think about the information we are presented and includes the ability to analyze, criticize and advocate ideas, to reason inductively and deductively and to reach factual or judgmental conclusions29.

When designing a web based course such that it includes critical thinking, it is important to clearly differentiate between the content of the course and the process by which the content is mastered. In fact, it is crucial to shift learning from simple content acquisition to a learning process that develops critical thinking in students. This is the basis of constructivist learning theory: the promotions of learning contexts in which students play an active role in learning in a social context. Consequently, researchers argue that constructivist learning techniques are best suited for fostering critical thinking in learners30.

And they further describe collaborative peer learning as an important constructivist learning technique that can foster critical thinking.

The development of critical thinking skills takes practice and requires regular opportunities for learners to critique and reflect on their own learning. As described above, the use of technologies like blogs and wikis provide critical thinking opportunities for learners. For instance, practicing blog writing in the graduate course, COHE 6000, helped students learn not only the importance of embedding reference links in support of their arguments but also helped them to develop skills to determine the appropriateness of including these links. Furthermore, blog readers became active participants by giving the author feedback and the blogger in turn, where appropriate, rebutted this feedback. As a result both sets of learners learned to take an active role in formulating, expressing, and critiquing an argument.

In the undergraduate course, HIMA 3118, creating a grand rounds disease presentation in a wiki environment helped learners learn to work as part of a team in developing a final ppt presentation of a patient’s disease course. They practiced skills in meeting deadlines, synthesizing content, evaluating and monitoring the quality of their work as well as in critiquing each others’ work. Wikis can be created, shared and edited among multiple users. As such they present an ideal opportunity for social learning in student groups.

Blogs and Wikis are powerful technologies designed to bring diverse individuals and groups together in the pursuit of social learning opportunities. In their article, Thomas and Maddux state, “In the case of Science, Technology, Engineering, and Mathematics (STEM) education, we must do more than challenge students to master the content of their chosen disciplines. We must help them develop the communication and collaboration skills that characterize modern professional and R &D subcultures.”

Blogs and Wikis are ICT tools that were successful in not only facilitating communication and collaboration skills but also in supporting critical thinking and learning in a web-based health services and information management curriculum.

References


[10] Ibid.


