ACTIVE LEARNING 2.0 OR WIKI IS NOT A 4-LETTER WORD

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ABSTRACT

This paper describes a project where open source wiki software was used to replace a course textbook. The setting is a senior course in management information systems at a mid-sized regional comprehensive university in the southeastern United States. Through a process of collaborative, active learning assignments, students in the class used the wiki software to facilitate the process of allocating topics, researching the topics, and then creating articles (e.g. web pages) on the class wiki. Using the tools available with the wiki software, the students integrated, categorized, and indexed the course content articles into a cohesive body of material that served the same purpose as a standard textbook. Because the students are working on the content for the wiki on a weekly basis, there is no opportunity to leave studying till the day before an exam. Plus the students like learning a new software system that is often in the news.
Keywords: Wiki, Active learning, Open source software, Web 2.0

INTRODUCTION

To many faculty the term wiki has almost become another example of a ubiquitous 4-letter word. Wiki is a concept that is not only not embraced, but in many situations it is not even allowed (Waters, 2007). In fact, the founder of the Wikipedia recommends that college students not use the Wikipedia for "class projects or serious research" (Young, 2006). However, one must differentiate web sites like the Wikipedia from the wiki software that runs the Wikipedia web site. The Wikipedia is a collection of articles written by a community of authors. The Wikipedia depends on wiki software to enable collaboration among authors and facilitate the authoring and publishing of those articles.

Many of the collaborative capabilities of wiki software open possibilities for additional types of collaborative, active learning. The purpose of this paper is to describe an innovative pedagogical strategy that uses open source wiki software as the tool to create a replacement for a formal student textbook. The problem motivating the project this paper is based on is the failure to have a technologically current textbook in an area where the demand is small and the rate of change is very high. The significance of this paper is that the project demonstrates the value created by the combination of a very low cost tool and high student engagement to create a collaborative, active learning experience yielding positive student learning.

THE SITUATION

Since the bursting of the dot.com bubble in 2001, there has been a steady decline in the enrollment in all types of computing programs at colleges and universities (Akbulut and Looney, 2007). While one might think that smaller classes would lead to increased student-teacher interaction (a good thing), the downside of this situation was that shrinking enrollments also meant smaller target student populations for computing textbooks. Couple the shrinking demand with increased opportunities to purchase used textbooks online, and you have the makings of a perfect storm for authors of texts in all computing disciplines. For example, consider the course used in the project described in this paper. Over the last ten years, there were only two textbooks wh appropriate for the course used in this project. One of the two books was on a four year revision cycle and the other has not been revised since 2002. Given the dynamic nature of the course content, Neither textbook was considered desirable for this course. Heretofore, the only alternative would have been to construct a readings list to assign to the students, or find and commit the time to write a textbook. The readings list option yields lots of current information for the students, but does not do much to engage the students in the learning process. Those were the only options facing many faculty in similar situations, at least until now.

MEDIAWIKI

While the idea of the Wikipedia as a research resource is unappealing to many, the concept of wiki software is somewhat different. Wiki software is an example of the applications and platforms that together have come to be called Web 2.0.. (O'Reilly, 2005). Web 2.0 is all about harnessing the collective intelligence of many people where the users add value through cooperation. Wikipedia may have a bad reputation where researchers are concerned, but it is a huge presence on the internet. The Wikipedia contains millions of articles written by hundreds of thousands of persons all

collaborating to create and edit the content which is viewed by several hundred thousand users daily in English alone. In the month of July, 2006, Wikipedia grew by over thirty million words. It takes some really powerful software to make the Wikipedia function and that software is called MediaWiki (http://www.mediawiki.org) and it is open source software.

Open source software, not to be confused with freeware, is software that is often distributed without charge, but more importantly it is software that is developed by a community of developers. Open source software is free to run, it is free to study and adapt to unique needs, it is free to redistribute, and it is free to improve and release to the community so that everyone benefits (http://www.gnu.org/philosophy/free-sw.html). The operative word here is "free" as in no cost. That means this tool is available to any faculty member, any student, any university, without charge.

MediaWiki is available to run on either the Linux or Windows operating systems and has very few other requirements. The most important characteristic is that the few other requirements for MediaWiki also have open source alternatives. The most direct installation of MediaWiki involves only open sources components: MediaWiki, the PHP scripting language, a database server (either PostGreSQL or MySQL are supported), and a web server (Apache is the open source preference, but Microsoft IIS will also work).

To get the course project started, the technical support representative to the department met with the professor starting in July, 2007 and discussed the project objectives, and then proceeded to download and install the MediaWiki software. PostGreSQL was already installed as it had been used in another class for the previous two years. In less than one day, MediaWiki was installed on a machine with a static IP address so that users could reach the MediaWiki server through the internet. User accounts were created so that the learning could begin before classes started.

WHY USE WIKI SOFTWARE?

The course for this project was the capstone course for the Management Information Systems (MIS) major at a mid-sized regional comprehensive university in the southeastern United States. The MIS department was housed in an AACSB accredited school of business. Given the limited text book options available for the course, the professor was already considering abandoning textbooks in favor of articles and cases distributed through the university's online course management system when he discovered MediaWiki as an open source software alternative. However, for the tool to be truly useful in creating a collaborative, active learning environment, it must offer tools beyond those found in the current course management system. Further, there must be a way to track and monitor attribution of Wiki content so that individual contributions could be readily identified. Finally, there must be power versioning incorporated so that changes could be "rolled back" if they were deemed inappropriate, inaccurate, or overall did not contribute to an increase in the student learning. MediaWiki does all that, and more.

Before any user can change content in MediaWiki, the user must have an authorized account with a unique user id and password. Upon installation of the MediaWiki software, the first option was to disable user account creation. On the Wikipedia anyone can sign up for a user account and edit the Wikipedia. That would not be a good situation for an educational project where content creation should be restricted to members of a specific class. However, once a user account is created, then any changes initiated by that user are permanently tracked by the MediaWiki software. As a privileged user, the professor can see who authored any changes to the wiki content down to the last comma. At the beginning of the semester, user ids and passwords were created for all students registered in the course.

For student controlled content generation to work, there must be some form of collaboration tool. MediaWiki has two tools just for collaboration. First, there is the Community Portal page. This is a common discussion area where every user can post general comments and information for all users. The Common Portal page has a link from the wiki home page so users can access this portal page with just one mouse click. Second, for every article created using MediaWiki, the software automatically creates a separate discussion page. On the discussion page, users can post comments about the page. These discussion pages create a forum for collaboration right inside the Wiki. Every user can read every comment, question, or suggestion that is posted on any discussion page and can contribute either through the discussion page or by directly editing the article page itself. Plus, everything entered on any wiki page is signed automatically so authorship is never an issue.

For content in the wiki to be useful, it should also support the concept of links so that a reference to a topic in one article can link to content in another article. For example, an article on business process management would possibly refer to service oriented architecture and business process reengineering. To avoid redundancies and inconsistencies, the BPM article would link to the other two articles and thereby increase the value of the single article. MediaWiki supports links both within the wiki and external to the wiki.

Some of the articles become rather lengthy and it could be problematic to subdivide them into more manageable pieces. However, the wiki software comes to the rescue on this issue also. Built into the editing tools of the edit page are tools to create topic subheadings in the content. Once there are four or more headings in one article, the wiki software automatically creates a table of contents for the page, correctly indented according the level numbers used when creating the subheadings. The table of contents is automatically displayed at the top of the article and each of the subheadings in the table of contents is a clickable link.

For content to be easy to find, especially when there are multiple students concurrently authoring articles, there needs to be a way of classifying articles into subject topic areas. MediaWiki supports the concept of content categories. With one simple instruction, MediaWiki creates a category and lists it on the wiki category page. A simple click on the category name bring up a category page which lists all the content articles listed in that category. Articles may also be added into multiple categories. Further, there is a search option so users can look for all articles containing a word or phrase. As each

page is time-stamped when it was most recently modified, there is also a link to a page which lists the articles most recent changed.

MediaWiki automatically creates many kinds of "special pages." Each special page has some form of statistic about the articles in the wiki. For example, the Popular Pages link shows the article pages with the most frequent access. You can see what pages are being read often and which pages are lonesome. The Uncategorized Pages link shows a list of all articles which do not belong to any category. There are restricted special pages which are reserved for system administrators. These special pages include User Rights Management and View Deleted Pages.

ACTIVE LEARNING WITH MEDIAWIKI

Morgan et al (2005) provided several definitions for active learning that included "anything that 'involves students in doing things and thinking about the things they are doing,'" and "any instructional method that involves the students in the learning process." Sampson and Jackson (2007) expand the definition when they say that active learning refers to "the direct involvement of students in their own learning process." However, not just any task can be used to generate the benefits of active learning. In this project, the class consisted primarily of senior MIS majors. One of the common characteristics of these students is their desire to learn new technologies. Therefore, this active learning project could generate additional student engagement by involving the students in learning to use a new technology that they might expect to encounter in the workplace after graduation.

Using the definitions above, active learning requires the students to have direct involvement in the learning process. Research papers have been used to involve students in the learning process for as long as universities have had paper. However, when a student writes a research paper, the student is involved in researching and writing about the specific topic of that paper. Rarely do students read and critique the papers of other students. Active learning in this project required students to choose a relevant topic, research that topic (hopefully, not exclusively on the Wikipedia), prepare a written explanation of that topic, enter that topic into the class wiki, select a category for the topic, and link the topic to other topics both internal to the class wiki and external to the class wiki. To do this, they had to get involved in the learning of their material and also that of their classmates. Clearly, this meets the definitions above for active learning.

THE PROJECT: BUILDING A CLASS WIKI INSTEAD OF A TEXTBOOK

The first night of class the students were excited. No book to buy meant a significant savings in the budget of most students. Plus, there was the perceived benefit of getting to work with a new software system. However, the first night of class proved to be more challenging for the professor. The question remained: how to combine the MediaWiki software with course learning objectives to achieve student learning. How to get students involved, keep them involved, and keep them learning.

The primary objective for the first night of class was to establish a clear set of expectations for participation, learning, and assessment. Two weeks were set aside for practicing and learning to use the MediaWiki software. Each student was given a very short assignment to create a personal page on the wiki. Since the wiki server was exposed on the Internet, student personal pages were limited in their personal information to protect the students' privacy and to avoid any FERPA violations. In addition, the class set up a Helpful Hints article page where students could post unique things that they learned how to do, such as uploading an image file, with the MediaWiki software. The students also created their own Help reference which borrowed significantly from the MediaWiki help pages.

Following the two practice weeks, work began in earnest on the class wiki. The expectation was set that each student would contribute 350 words of new content each week. The 350 word count was determined as being just under two pages of double spaced content. Content could be added to existing pages or to create new pages, but every student contributed 350 words every week. No content was due the week of Thanksgiving and the lowest weekly content contribution could be dropped, but every student contributed and was graded on their new content every week.

To determine the content areas for the students, each week there was class discussion about the objectives for the following week. For example, if the objective for the following week was strategic planning for information systems (SPIS), the class would talk about what SPIS was, how that relates to Porter's models for competitive advantage, SWOT analysis, etc. Students would then use the Common Portal to discuss the topic and gradually students would stake out their topic objective for the following week. Often articles or books were suggested in class as possible materials for the wiki content. Since there is no textbook, the class was free to explore current topics in the subject area including those that would be too recent to appear in any formal textbook, even an electronic one.

Each week, every student made a short presentation to the class. Each presentation consisted of a summary of what the student contributed to the wiki and how their content contributed to that week's learning objectives. In addition, each student had to identify articles created that week by two other students and briefly describe what they learned from those articles. So, for each week, every student had to research and write a short page contributing to that week's learning

objectives, read the other students' pages, and make a brief presentation on that material. Thus, every student was engaged, every week. By the end of the tenth week of the semester, there were 114 articles on the class wiki. Other than the main page which appears every time someone connects to the class wiki, pages have been referenced hundreds of times: the main article on strategic planning, one of the primary learning objectives for the class was referenced 788 times; the main article on the IS/IT organization was referenced 596 times; and the article on the CIO was referenced 574 times.

CONCLUSIONS AND LESSONS LEARNED

Wiki software is a powerful tool for achieving collaborative, active learning in a class. However, the teacher must be engaged with the students. While telling the students that their work is online for the world to read, and for Google to capture offers some motivation, having the teacher read and make comments on the discussion page is also a powerful motivational tool.

Not all students have the same motivations as MIS majors. However, in this class there was one senior accounting major. Comments from this student indicated that the tool actually helped level the playing field within the class. Today's millennial students were raised with computers and communications tools. They expect to use these tools in school. Wiki software is just another tool to reach these students and include them in collaborative, active learning.

Even though the students are creating the course content, the teacher must still set the parameters and steer the direction for the class. Otherwise, chaos will quickly ensue. Short discussions after the student presentations can tie content together cohesively and set the direction for future student content development. Since all the work is done on the wiki, the teacher can see everything that is and is not being done. That makes early intervention possible whenever it is necessary.

Many of the same caveats that apply to working on virtual teams apply to working collaboratively on a wiki. There must be clear task specifications. There must be clear time lines for deliverables. For example, one student cannot expect class mates to assess the content added this week if the student did not complete the addition of new material until five minutes before class starts. Students have to trust that everyone is working toward the common objective. Some will do better than others, but that becomes obvious during the weekly presentations.

In conclusion, MediaWiki software is free, relatively painless to install, makes it easy to learn the basics of posting content, and provides a powerful tool for creating class content in a collaborative, active learning environment.

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