

Wikis as a Tool for Collaborative Course Management

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Abstract

There are growing expectations among college students to be able to access and manage their course materials over the World Wide Web. In its early days, faculty would create web pages by hand for posting this information. As Internet technologies and access have matured over the past decade, course and learning management systems such as Blackboard and Web CT have become the norm for distributing such materials. In today's Web 2.0 world, wikis have emerged as a tool that may complement or replace the use of traditional course management systems as a tool for disseminating course information. Because of a wiki's collaborative nature, its use also allows students to participate in the process of course management, information sharing, and content creation. Using examples from an information technology classroom, this paper describes several ways to structure and use a wiki as a course management tool, and shares results of a student survey on the effectiveness of such an approach on student learning.

Keywords: Wiki, Course Management, Collaboration, Web 2.0, Content Creation, Student Learning.

Introduction

Traditional course management systems such as Blackboard, Moodle, or WebCT provide integrated solutions for faculty to post course content, assignments, and student grades. They are often document-centered, allowing instructors to post PowerPoint slides, Word and PDF files, and other course content for students to access. In addition, many course management systems allow students to log in to check grades, submit assignments, or take exams electronically. The responsibility lies with the instructor to create the course content for students to download or access.

This paper describes best practices for using a collaborative web application known as a wiki to augment a traditional course management system. A wiki allows users to create, post, edit, or delete web pages, thus promoting collaboration among its users. As such, a wiki is a useful tool for involving students in the process of creating and sharing course content. While course management systems have specialized features such as online grade books and exams, useful exclusively in academic environments, students are unlikely to encounter such applications outside of a college classroom. By introducing a wiki for collaborative course management, students also learn to interact with a real world tool, enabling them to accomplish some tasks that would be more cumbersome if not impossible using a traditional course management system.

Because students and faculty can both post information to the wiki, the role of the instructor changes from being the single authority to being a partner with the students in their own learning. As David Weinberger writes in his book *Everything is Miscellaneous*, "When anyone can publish at the press of a button, the social role of gatekeepers changes." (Weinberger, 2007, p. 102) Knowledge no longer exclusively comes from a single instructor; rather, a wiki enables all students to contribute to each other's learning. "Wiki use reflects the view of an instructor as one who facilitates information sharing among learners rather than simply transmitting knowledge from themselves to their students." (Mindel & Verma, 2006)

Enter the Wiki

The concept of a wiki “is at once both so simple and so novel that it is difficult to grasp.” (Cunningham & Leuf, 2001) The term *wiki* was coined by Ward Cunningham on a visit to Hawaii, where he took the “Wiki Wiki” or “quick” shuttle between terminals at the airport (Cunningham & Leuf, 2001). The term now describes a “freely expandable collection of interlinked Web pages, a hypertext system for storing and modifying information – a database, where each page is easily edited by any user with a forms-capable Web browser client.” (Cunningham & Leuf, 2001, p. 14)

Wiki software tracks revisions so that one may revert back in case of error or malice. This versioning capability is also useful to monitor the development of a particular page of web content. In most cases, if two users try to edit the same page at the same time, one will be locked out until the other has completed making updates. Changes to a wiki are published instantly.

Both wikis and blogs (short for “web logs”) are collaborative web applications for posting information on the World Wide Web, and have varied use in higher education. (Davi, Frydenberg, & Gulati, 2007). While a blog allows its users to comment on each other’s posts, participants cannot change anything that they, themselves, did not post. Blogs are online journals organized chronologically with new posts at the top, while wikis have a much more open structure, which allows participants to add new pages, or change the content of existing pages. (Lamb, 2004) Thus the wiki is “forever evolving.” (Wang & Turner, 2004)

One creates a wiki by installing the application to a web server, or more commonly, by registering with the wiki provider and hosting it at their server. In either case, the site is both updated and accessed through a web browser, so no software needs to be installed on the client. There are several free wiki providers. The web site Wikimatrix.org compares features of several wikis. By answering simple questions such as “do you need page history”, “do you require a WYSIWYG (what you see is what you get) editor”, and “will your wiki be hosted on our site or yours,” WikiMatrix is often able to recommend an appropriate wiki provider for a user’s intended purpose.

A user may easily create or modify wiki pages without any detailed technical knowledge of HTML (Hypertext Markup Language). Most wikis now include a WYSIWYG editor enabling simple text entry. Some earlier wikis required their users to master a special wiki markup language for formatting text to appear in a wiki. Because more than one person may edit a wiki page, wikis provide a space where “knowledge becomes networked ... but remains ephemeral: it changes, and can be changed and mediated by the community.” (Duffy & Axel, 2006, p. 6)

Educational Use of Wikis

Hemphill and Yew (2007) are optimistic regarding widespread acceptance of wikis in educational circles, citing their advantages over other collaborative tools such as email (which is disruptive) and threaded discussion boards (which are not always conducive to finding accurate information). Because they “capture version changes, allow for distributed administration, and persist – wikis ...[are] a means to organize and share knowledge It is likely that given the knowledge distributed among members of an academic community, ... such a technology could prove useful.” (Hemphill & Yew, 2007, p. 274) These features make wikis a “cost-effective and readily adopted knowledge management tool” (Lamb, 2004, p40) for educators, businesses, and organizations who wish to capture communal knowledge.

Wikis have made their way into the classroom as tools for teams to perform group authoring and collaborative analysis, develop literature reviews for research projects; participate on signup sheets; summarize readings, post project summaries, communicate with students and create knowledge bases (Mindel & Verma, 2006; Guth, 2007).

Wikis are useful for students to share their class notes (O’Neill, 2005; Guth, 2007). O’Neill proposes that “the instructor places skeletal lecture notes onto a wiki site, and students flesh them out with materials they have learned in class...” Students create a study aid for their classmates, and the instructor sees what students took away from the lecture. A wiki’s public nature inspires students to “gain a greater sense of collective ownership” (Guth, 2007, p. 63) over the shared content and process to which they contributed.

A project management course in a computer science curriculum makes use of wikis to capture group activities and store them in a centrally available location (Xu, 2007). In an information technology course, the wiki paradigm “promotes an active learning environment in an educational setting, because students and instructors become co-creators of course content.” (Elrufae & Turner, 2005, p.770) To teach proper XHTML syntax, and as an alternative to requiring students to learn specialized wiki markup language, Elrufae and Turner (2005) developed a wiki application requiring students to use valid XHTML for input; invalid code would not be accepted.

Students at Brown University have created a wiki for their classmates to review courses they have taken. The unstructured wiki provides a forum for stating opinions on a particular course, providing “richer reviews that combine multiple impressions and perspectives.” (Duffy & Axel, 2006)

Wikis have found their way into industry as well, as organizations use them to capture aspects of corporate knowledge. Introducing wikis in the classroom prepares students for the “real world” where wikis are used for collaboration between project groups, collective content management, and creating an online encyclopedic knowledge base.

Educational Concerns

Lamb (2004) predicted that it is “a safe bet that wiki-like writing spaces will be featured in future course management systems - along with other social software tools and protocols such as weblogs and RSS - but if practices don’t evolve, the effects on student learning will be superficial at best.” (Lamb, 2004, p. 46)

In 2007, released versions of Moodle and Blackboard both included built-in wikis as plug-ins from third-party providers. (Moodle: Modules and Plug ins) Blackboard 7 introduced wiki functionality (Blackboard Building Blocks) and allowed for integrating wiki pages within a Blackboard site, or by incorporating a link to a Blackboard wiki from the course menu. However, since Blackboard’s wiki is plug-in, its wiki pages cannot currently link to existing Blackboard pages elsewhere on the site, outside the wiki. It is easy to track which students contribute to the wiki, because access can be set to only allow registered students to modify it.

Some wikis lack features that are necessary for their acceptance within the educational community. Lamb (2004) and Hemphill and Yew (2007) argue that a WYSIWYG editor is required, because learning a wiki markup language is a “powerful deterrent to nontechnical users.” (Hemphill & Yew, 2007, p. 276) Wang and Turner (2004) proposed extensions for wikis to make them more suitable for classroom use. These included page locking to handle concurrent edits, and access control to protect certain public pages (such as the syllabus) or provide private spaces for collaboration.

Security is also an issue among educators. Lamb (2004) suggests that the openness in a wiki is problematic because anyone can change anything. On the other hand, this also promotes a sense of trust and community among its users.

Wikis for Course Management

Maloney (2007) suggests that today’s course management systems are not being used to their fullest potential. Because they are “built around the ... course, not the ... student,” their most common uses are for faculty to distribute handouts and students to check grades. “The role that the systems play most often is like that of an advanced photocopier, allowing faculty members to deliver materials to their students with greater ease than was previously possible. That use can be important, but it is only part of what the systems could do.” (Maloney, 2007, p. B26)

While the traditional course management system (CMS) is best used for these common tasks, a next-generation CMS must be centered around the student’s learning, not the course’s administration. This paper suggests that a wiki may supplement the traditional CMS and give students a forum for collaborating and sharing their knowledge and understanding for the benefit of their classmates.

Lamb (2004) cautions that using a wiki as a CMS has its own concerns. Tracking user contributions may be difficult, and if the instructor provides too much structure, that could limit the wiki's effectiveness. "An instructor could structure and regulate interaction to such an extent that the wiki is effectively transformed into a stripped-down course management system. But doing so risks diluting the special qualities that make wikis worth using in the first place." (Lamb, 2004, p. 45)

Course Background

IT 101 (Introduction to Technology) is a course required of all first year students at Bentley, a national leader in business education. The course introduces students to basic technology concepts, ensuring they gain basic competency in using and maintaining their computers, and fluency in using the Internet. The course builds individual skills in creating web pages, developing spreadsheets, and navigating the Windows XP operating system, all crucial skills for future business leaders.

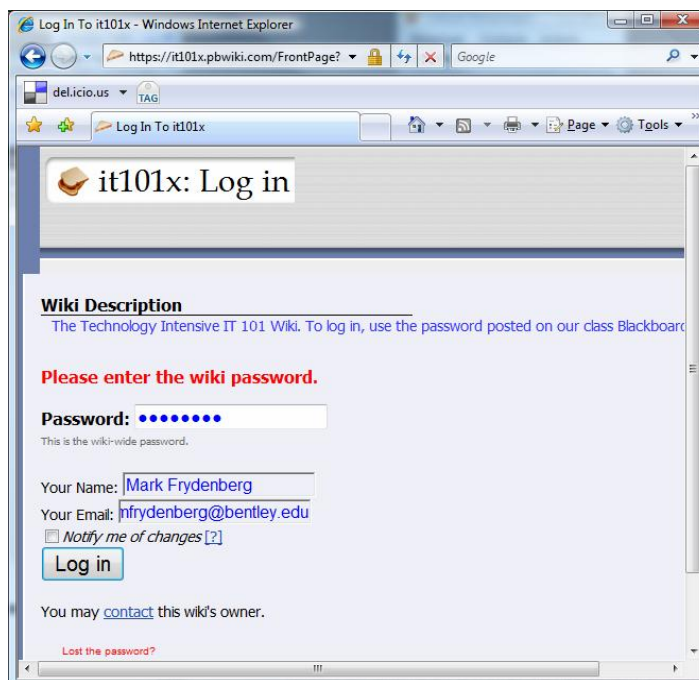


Figure 1. Wiki Login Screen.

Accessing the Class Wiki

This class uses [PBwiki](#) (PBWiki.com, 2008) and as its wiki provider. The product is very user- and educator-friendly. The company provides several suggestions for using a wiki in the classroom on [their web site](#). PBwiki supports solutions for many of the concerns listed in the previous section, as it includes a WYSIWYG editor, supports page locking, and has announced that an upcoming release will provide improved page access features and folders for organizing wiki pages.

In the wiki used in this class, all students share a common wiki password, and provide their name and email-address when logging in. (See Figure 1.) The wiki records any changes as originating from the name provided and contributors may elect to receive email notification of any changes. Knowing that they would be graded on their participation on the class wiki was a sufficient incentive for students to log in using their real names.

Upon logging in, the user sees the wiki's front page. This "home page" acts as a class portal containing links to other wiki pages and external web sites. An announcements panel appears at the top of the page; the *Students* panel on the left contains links to student rosters, class blogs and podcasts, as well as

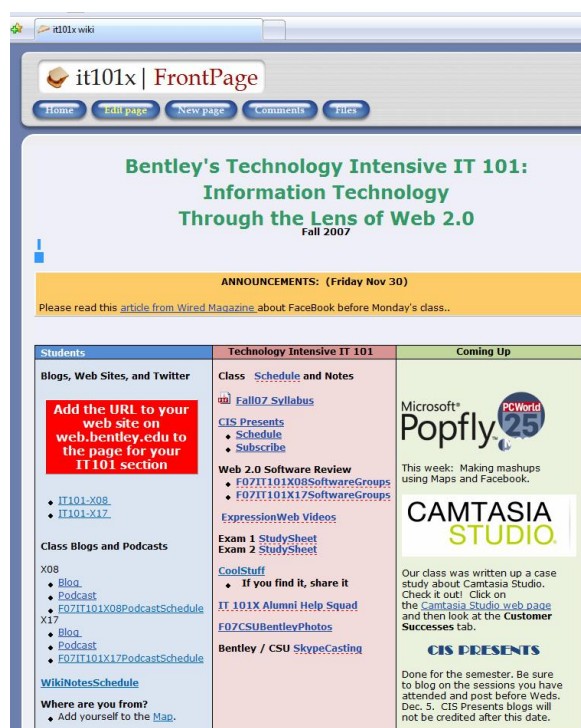


Figure 2. The Class Wiki Main Page.

the schedule for students to contribute their class notes to the wiki.

The *Course* panel contains course materials, including links to a syllabus page, signup sheets, videos, and collaborative exam study sheets. The *Cool Stuff* link (described “If you find it, share it”) is a place where students can share interesting web pages, tips, or other resources with their classmates. The *Coming Up* panel on the right contains information about upcoming classes or other class news. (See Figure 2.)

One of the first exercises that students complete in order to learn how to use the wiki requires them to create a class roster listing their names alphabetically. Undoubtedly someone posts his or her name in the incorrect place, and other students quickly realize that they can change what their classmates wrote by moving the name to its proper position. Other students will discover that they are locked out of the wiki if they try to edit it at the same time when someone else is already doing so. They must wait until the change is completed, or the page lock expires due to inactivity.

Students quickly find that they can add pages or content to the wiki. Teachers no longer control the entire learning experience. No longer are they “organizers and facilitators of learning activity, distributors of learning material [and] assignments.” (Lund & Smordal, 2006, p. 40)

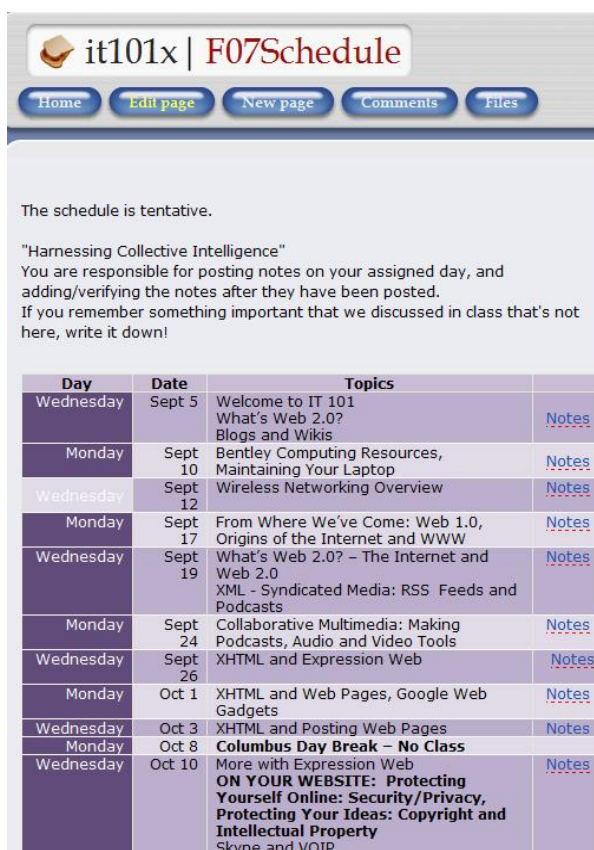
This class used a wiki for syllabus management, project management, collaborative writing and studying. The next sections describe techniques employed for doing so.

Syllabus Management

The syllabus is essential to every college course. It lists course policies, assignments, and schedules. Of all documents posted to a course management system, the syllabus is the one that is most likely to be modified or updated as the semester progresses.

Often distributed as a Word document, or posted online as a document or PDF file, once posted, it is tedious to update. Only the most diligent instructors will take the time to update the Word document, convert it to PDF, and post the updated PDF back to a web site or CMS every time they deviate from the original schedule. For practically everyone else, the schedule in the PDF file posted on Blackboard prior to the first class is “off” shortly after the semester begins. By creating it as a wiki page, the syllabus becomes a living document that is easy to update in the likely event that the schedule changes. In this way, the syllabus more accurately reflects the class pace.

The schedule page displays hyperlinks to other wiki pages containing student-contributed notes or instructor-provided course materials. (See Figure 3). Lucas and Frydenberg (2000) developed a web-based application for course management using Active Server Pages, where each page had this structure. Today the use of a wiki is a much more general solution, and renders this specialized application obsolete (Lucas & Frydenberg, 2000).



Day	Date	Topics	
Wednesday	Sept 5	Welcome to IT 101 What's Web 2.0? Blogs and Wikis	Notes
Monday	Sept 10	Bentley Computing Resources, Maintaining Your Laptop	Notes
Wednesday	Sept 12	Wireless Networking Overview	Notes
Monday	Sept 17	From Where We've Come: Web 1.0, Origins of the Internet and WWW	Notes
Wednesday	Sept 19	What's Web 2.0? - The Internet and Web 2.0 XML - Syndicated Media: RSS Feeds and Podcasts	Notes
Monday	Sept 24	Collaborative Multimedia: Making Podcasts, Audio and Video Tools	Notes
Wednesday	Sept 26	XHTML and Expression Web	Notes
Monday	Oct 1	XHTML and Web Pages, Google Web Gadgets	Notes
Wednesday	Oct 3	XHTML and Posting Web Pages	Notes
Monday	Oct 8	Columbus Day Break - No Class	
Wednesday	Oct 10	More with Expression Web ON YOUR WEBSITE: Protecting Yourself Online: Security/Privacy, Protecting Your Ideas: Copyright and Intellectual Property Skype and VOIP	Notes

Figure 3. The Schedule Page.

Project Management

Wikis “establish virtual learning spaces or environments that facilitate collaboration across time, interruptions, and distance.” (Mindel & Verma, 2006, p. 11) The power of the wiki as a project management tool comes when students add information to it.

In one project, each group set up its own wiki page to chronicle work and share materials with other group members. A template provides the structure for students to enter their names and tasks completed. By using the wiki as a collaborative workspace to note each time a group member works on the project, each group creates a log of contributions and a centrally located collection of resources for team members. (See Figure 4.)

Collaborative Writing/Note Taking

To promote collaboration, two or three students are assigned specific dates throughout the semester to post their notes from class to the wiki. To ensure that they were posted in a timely fashion, students had to complete their wiki notes prior to the start of the following class. Classmates then reviewed these “Wikipedia-style” notes pages, and added information that they learned but the original authors may have omitted. The instructor provided a template containing the class date, space for the contributors to enter their names, and a blank page below for the notes. “Putting a lecture skeleton onto a wiki website and encouraging students to flesh out that skeleton can create high-quality lecture notes and provide an instructor with valuable feedback on what students have understood.” (O'Neill, 2005, p. 268)

The instructor taught both a morning and afternoon section of the class on the same days. Often one student from the morning section and one student from the afternoon section would be assigned to contribute to the wiki notes for the day. The intention for doing so was so that students could experience their work being edited or changed, possibly by other students who they did not know, to mimic the anonymity of posting to Wikipedia.

A few weeks in to the semester, however, the students from the morning section realized that they could take notes directly in the wiki during class, rather than copying or retyping their notes later. As a result, the task of the student in the afternoon section often shifted from content creation to content verification and embellishment. That student had to review the notes which the morning

Working Together With a Wiki

This wiki page is your group's shared working space. . . Your entire group can share information using this wiki, keep track of your progress, and make your findings accessible to everyone in your group.

Back to [F07 CSU Bentley Topics Schedule](#)

Group members

- Emily B (Charles Sturt University, email: ebowen02@postoffice.csu.edu.au, msn: embo_724@hotmail.com)
- Jonathan S (Bentley College, skype name = hardhittinghebrew, email=scher_jona@bentley.edu)
- Kosha D (Bentley College, skype=kcdiatia, e-mail=divatia_kosh@bentley.edu, AIM=nDnMaFiA89, etc.)
- Bec R (Charles Sturt University, email: rrossi02@postoffice.csu.edu.au, msn: beachbabe117@hotmail.com.)

Topic

"What do you do with Internet? shopping, social networking, or etc?"

Activities

Remove the sample entries, or add your own beneath them. Every time you work on some aspect of this project, keep a log as to what you do, with whom you do it, and how long it takes. If more than one person is involved in an activity, only one person has to post it to the log.

For communication method, please be as specific as possible. For example, did you use voice, webcam, text, or some combination? (Erase these entries and replace with your own.)

Date	Start Time	End Time	Member(s) Involved	Communication Method	Activity	Outcomes or Action Items
Examples						
16/10/07	9.20am (AU)	9.40am (AU)	Bec, Em, Jonathan and Kosha	Skype	Discussion about subject, how Aus differs to US, technology, University webpages, Ebay, YouTube, FaceBook, messenger services i.e. MSN, iPod's, music/movie downloading i.e. bitTorrent, limeWire, uTorrent etc.	
22/10/07	7:37PM (US)	7:57PM (US)	Jon, Kosha, Bec, Em	Skype	discussed: shopping online, researching online, Google (iGoogle), Weather, Webcams, Google Earth, taking	

Figure 4. Collaborative Workspace on the Class Wiki.

it101x | 20070924Notes

Home Edit page New page Comments Files

Back to [Fall 2007Schedule](#) Page

Date: September 24, 2007

Contributors

- Anthony
- Chris
- Joseph

1. Contributors

2. Make sure to:

3. Timeline of the Podcast

a. 2001- dave Winer syndicates a grateful dead song on his web blog

4. Tips for making a podcast

a. Have a plan Conversational - Be yourself Know your equipment Pay attention to copyright issues regarding music, pod safe music Include Title Screen up front and Credits at end Practice (time limit, check if it works) Keep within time limit Listen or watch before posting!

b. Podcasting Software

Make sure to:

a) subscribe to class podcast (email sent with link)

b) sign up to make a 5-7 minute podcast on a subject learned in class with a partner

c) read article on RSS feeds (posted on blackboard) - [7 Things You Should Know About RSS](#)

d) unsubscribe to Mr. Excel's podcast

Figure 5. Class Notes Page of Wiki.

student had already posted, and perhaps correct or enhance them, by posting a graphic, hyperlinks, or other related information. (See Figure 5).

To alleviate the problem of always having the notes posted by the morning class students before the afternoon class student has a chance to write anything, during the next semester, the instructor will assign only morning class students or afternoon class students to submit notes on a given day.

On occasion, if something important is missing from the notes, the instructor would either add it, or more likely, discuss it in the next class, and suggest that a student make the appropriate updates.

Collaborative Study Sheets

"When contributing to a wiki project, students are not just writing for the teacher, as is the case in traditional classroom environments, but for and *with* their peers." (Guth, 2007. p. 62) Students used the class wiki to create a collaborative study sheet from which the instructor would select potential questions for an examination. A template wiki page contained descriptions of possible question topics, with question placeholders instructing students to "Type your question here" or "type your answer here." Students also posted their names following each question. Each student had to post one original exam question (and answer) in one of the open placeholders. Students quickly experience the benefits of collaboration, as each contributes one question, and has the benefit of everyone else's questions. Students who posted earlier had their choice of open topics on which to post their questions; students who posted later had to read through all of the questions that their classmates had already posted in order to be sure not to repeat one of them. At the same time, students who posted earlier had to return to the wiki as their classmates added to it, in order to gain the benefit of their contributions. The upcoming exam would draw from questions based on those that the class had developed. In this way, students not only helped to make up the exam, but they potentially had a copy of it even before it was administered.

Students were also told to review each others' answers and enhance or correct them if necessary. As the exercise continued, the instructor would also monitor the wiki, posting notes or comments if a question was inappropriate, or an answer was incorrect. If an important question had not yet been asked, the instructor, on occasion, would post a question on it, along with the words "Needs an Answer" for one of the remaining students to provide.

When grading an exam, the instructor noticed that several students gave the same incorrect answer to one of the questions. A quick check of the wiki indicated that the answer to the question on the wiki was incorrect. Students clearly used the wiki page for a study tool, but nobody happened to catch – or correct – that particular inaccurate answer.

What an unexpected teachable moment! It happened at about the same time as Wikipedia discovered that one of its most popular contributors, who claimed to have advanced degrees in theology, was really 24-year old college drop out (Williams, 2007). The instructor asked "if you can't trust people who you know in your own class to get it right, how you can trust Wikipedia?"

A long discussion ensued that day about the validity of information that is available on Wikipedia and other web sites, and who is ultimately responsible for their accuracy. Students offered their ideas about how to better handle this situation so that it doesn't occur again. One student suggested that "next time, each of us should post one question and answer, and indicate that we verified (or contributed to) another student's answer." Most students thought this simple system of checks-and-balances creating a "self correcting community" (Guth, 2007) would be a sufficient improvement over the original ad hoc process, and help promote the accuracy of the resulting collaborative study sheet.

Impact of Wikis on Student Learning

The instructor used a wiki to augment the traditional course management system in an introductory information technology course for three consecutive semesters beginning in Fall 2006. During each semester, students used the wiki as a collaborative workspace for posting shared materials, signing up for projects, and collaborating with classmates. During the Fall 2007 semester, teams of two or three students collaborated to post notes from a designated class session to the wiki.

The first goal of this study was to ascertain students' prior experience and knowledge of wikis. The second was to gain an understanding of their opinions on the usefulness of wikis as a tool for learning and collaboration, and as a tool to support college classroom management.

The instructor administered the same voluntary, online survey regarding students' experiences using the class wiki at the end of each semester of the study. Because the wikis were used in much the same way throughout the study, responses were combined for each semester, and the aggregate results are presented in the figures that follow. A total of 145 students completed the survey during the three semesters of this study.

Quantitative Results

It was expected that most students had heard of, but not used a wiki regularly prior to taking this class, and assumed that after using one, they would come to understand the benefits of a wiki for collaborative study and learning. The results shown in Figures 6 and 7 are in line with these assumptions.

Over 13% had never heard of a wiki prior to this class; 37% had heard about wikis but never posted to or edited one; 39% said that they knew about wikis because of Wikipedia. Only 9% of the students said they had posted to a wiki prior to this class. Each student posted or modified content to the wiki an average of 7 times during the semester that they were enrolled in the course.

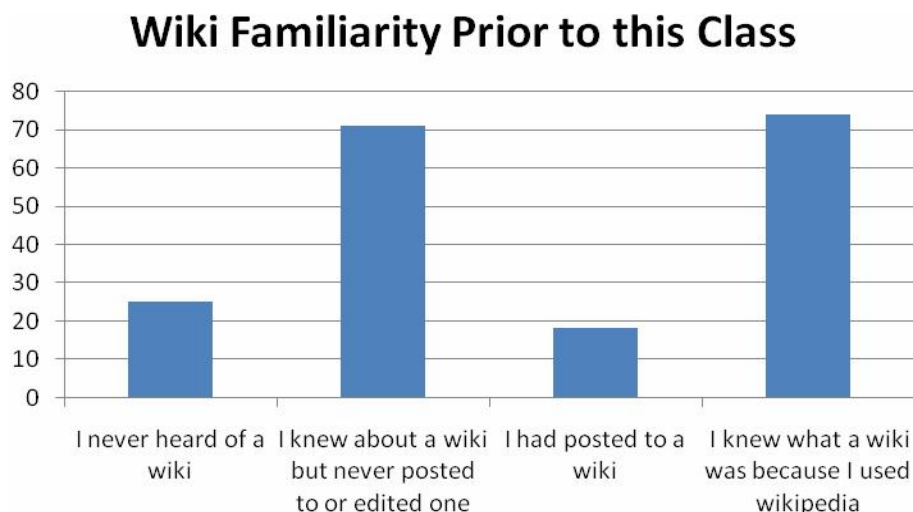


Figure 6. Wiki Familiarity Prior to This Class.

Table 1 displays the questions related to attitudes when using a wiki. Each of these responses was indicated on a 7-point Likert scale, where 1 corresponds to Strongly Agree (SA), and 7 corresponds to Strongly Disagree (SD). The number of students who provided no answer (NA) to each question is also indicated in the charts summarizing the results in Figure 7.

The study elicited responses in three areas: impact of wikis as study and learning tools (Q1, Q2, Q7); collaborative benefits of wikis (Q3, Q4); their ease of use (Q5, Q6), and their benefits as course management tools (Q8, Q9, Q10).

Figure 7 shows that the majority of the students surveyed felt that using the wiki contributed to their learning (Q1 and Q2). Their interaction with the wiki gave them a sense of its benefits as a tool for collaborative learning (Q3 and Q4), and they found it easy to post information to the wiki (Q 5 and Q6). Students in the Fall 2007 semester found the class notes created by their peers to be a useful study aid (Q7).

Q1	The class Wiki helped me work more efficiently.
Q2	The use of a wiki in this class helped in my learning.
Q3	Having students collectively create an exam study guide is a good use for a wiki.
Q4	I could see the value of collaboration when using a wiki.
Q5	Posting information to the class wiki was easy for me to do.
Q6	It was hard to learn how to post information to the class wiki.
Q7	The class notes posted on the wiki were helpful for me as I studied or reviewed what happened in class each day.
Q8	I wish that more college courses would use wikis as part of their online course management.
Q9	With a class wiki, blog, and Blackboard site, it was hard for me to keep track of what course information was posted where.
Q10	I wish that more college courses would use wikis as part of their online course management.

Table 1. Wiki usage.

The majority of the students wished that other courses would also use a wiki as part of their online management (Q8), although students were mixed in their abilities to manage multiple course management tools (Q9). One student commented, "Having the wiki and Blackboard at the same time was sometimes confusing because whenever I go to check what assignments are due and what need to be done, I always have to go to both websites."

The course used Blackboard for administrative course tasks – uploading and submitting homework, posting assignments, course materials, and grades. The class blog served as the place for students to post video podcast episodes that they created, or comment on those of their classmates. Students used the wiki as their place to contribute to the course – by signing up for projects, posting collaborative questions and notes, or other items of interest for the class. It is important to note that students did not have difficulty using the any of the different web-based course management tools, but with so many of them, some needed reminders as to which ones they were expected to use at different times.

The responses to Q10 ("I don't really need to know about HTML since I can use a blog or a wiki to put information on the Web.") were also varied. Students learned to create simple web pages using HTML (Hypertext Markup Language) early in the course. Many found value in doing so because knowing HTML gave them complete control over the design of their web pages and the content they were posting to them. However, with many collaborative, web-based applications (blogs, wikis, and Facebook, for example) available for posting one's information to the Web, the reasons for teaching HTML today are different than they were even five years ago. Then, it was critical to know HTML as creating a web page was the only way to have a presence on the Web. Several students realized that a knowledge of HTML was helpful (but not critical) for their ability to post information on the class wiki or blog because it allowed them to display content other than text. They would often switch to HTML view of a page or use an HTML container plug-in on PBWiki to enter the code for image tags, or embed the HTML code to post YouTube videos or Google gadgets to the class wiki, or their own blogs.

The survey also asked students for their suggestions of additional ways that the class might incorporate the use of wikis. Among their suggestions:

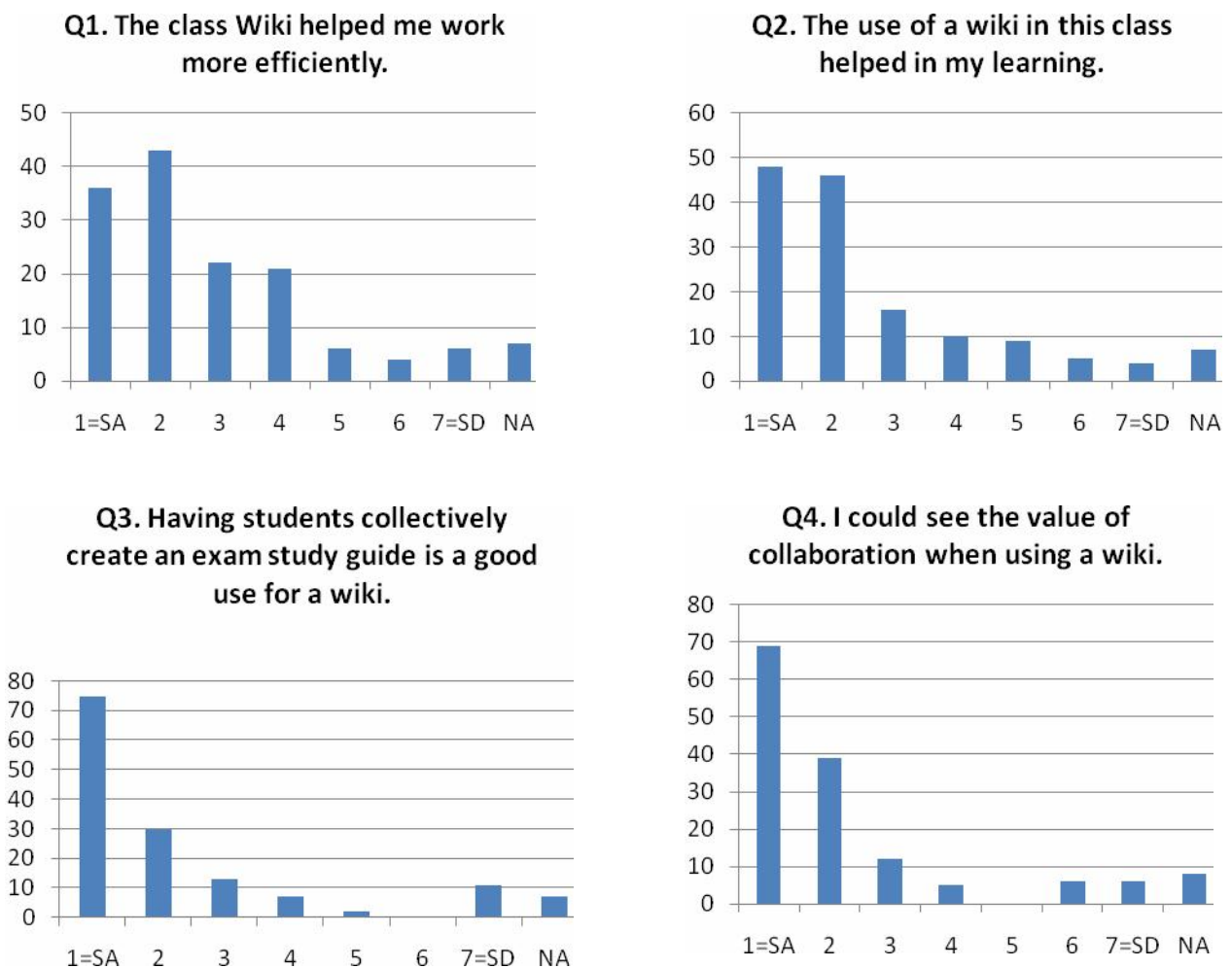
- To hold course documents instead of Blackboard
- To post evaluations to other students' projects
- To share helpful tips from class or hints on homework
- To provide information on non-academic topics (such as restaurant reviews, locations of useful campus resources, etc.)

Qualitative Results

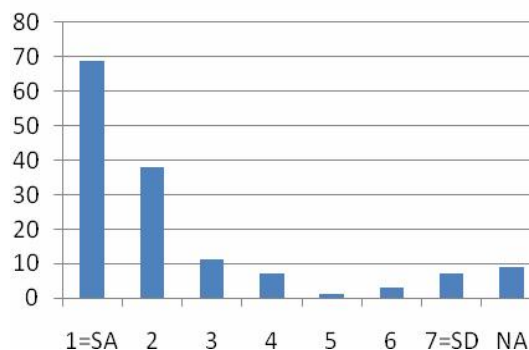
Students reflected on their experience during the semester by blogging on the question “What did you learn this semester that I can’t test you on?” Several students commented on the ease of communication that web-based tools provide, and on how their use impacted not only their learning, but also that of the entire class. One student remarked:

Coming into IT I really had no idea what to expect. But when we started using [the class] wiki... I was very intrigued by just how much could be accomplished... ...I found the task of using a wiki ... [to be] very useful for my expressing my ideas on the internet, especially with so many people using Wikipedia these days.

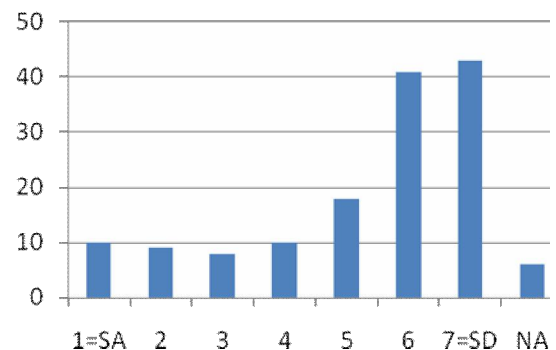
Figure 7. Survey Results. (SA = Strongly Agree; SD = Strongly Disagree; NA = No Answer.)



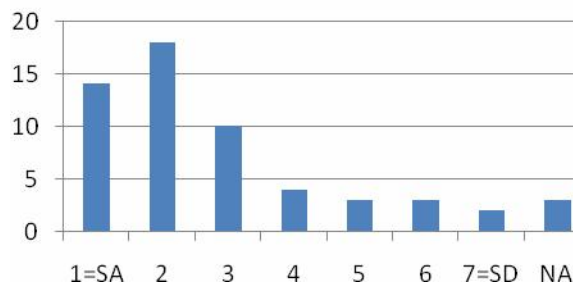
Q5. Posting information to the class wiki was easy for me to do.



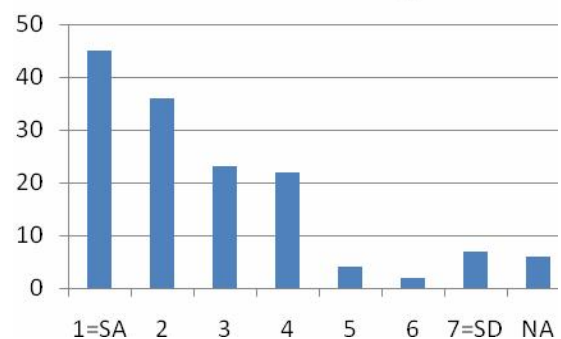
Q6. It was hard to learn how to post information to the class wiki.



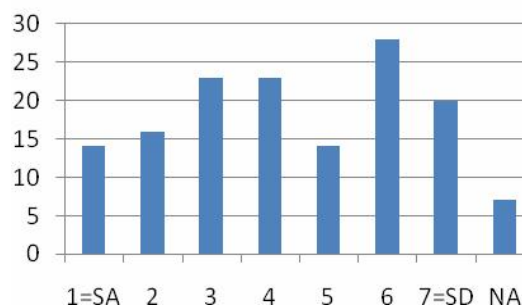
Q7. The class notes posted on the wiki were helpful for me as I studied or reviewed what happened in class each day.



Q8. I wish that more college courses would use wikis as part of their online course management.



Q9. With a class wiki, blog, and Blackboard site, it was hard for me to keep track of what course information was posted where.



Q10. I don't really need to know about HTML since I can use a blog or a wiki to put information on the Web.

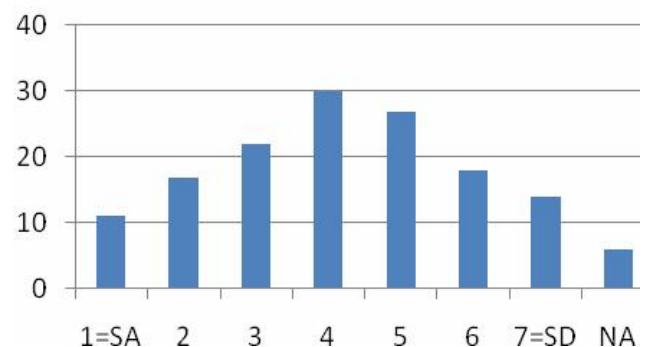


Figure 7. (continued)

Said another student:

Using blogs, wikis, and podcasts was a valuable way for me to not only learn and participate, but also see how [technology] can be used effectively. It felt like our IT101x class was on the cutting

edge of technology and learning. Using the class wiki communicated the importance and power of communication over the Internet.

I learned that I have the power to change the Internet with the tools that I am given.

One student had a better understanding of how the World Wide Web evolved into a platform that enables the use of wikis and other collaborative tools:

Before this class the only wiki that I have ever used was Wikipedia, but still I was not very familiar with this technology. This form of technology allows various people to update the wiki, which makes communicating amongst many people much easier, especially using the notes page in our class wiki.

Students knew that they were accountable when posting information to the course wiki, and recognized the power that was entrusted to them in doing so. At the same time, they found this shared participation to be beneficial. One student commented:

One thing I really liked about this course and felt was something that would be useful in other courses too is the use of a class wiki. It was a good place to go, and it was nice to be able to edit on a collaborative site than have a set page. It was also good to be able to put up interesting information and be trusted with the opportunity to administer the site. It also helped build a sense of responsibility and collective understanding. It exposed me to a lot of new ideas that I otherwise wouldn't have learned. [The wiki] was also a way to make the course more interactive and hands on, which is something I think everyone enjoyed.

Conclusion

This paper describes techniques and pedagogical considerations when using a wiki to augment a traditional course management system, and presents best practices for their use. Building a course around the use of a wiki invites students to become involved in the process of creating course content and sharing their knowledge with their classmates. The results of this study suggest that many first year college students only have a cursory knowledge of what wikis are, and incorporating their use in the classroom will add value not only to students' studying and learning, but also to their potential success as future knowledge workers and technology professionals.

Appendix.

A video tour of this class wiki is available online at <http://www.screencast.com/t/GcMea6VP>.

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