

Using Wiki in an Online Record Documentation Systems Course

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Abstract

We report a case study using a wiki tool, Confluence, including a brief history, current status, and motivations for using Confluence. We describe how we created two spaces on Confluence for two consecutive classes, 2006 and 2007, in a health information management baccalaureate online course, Record Documentation Systems. The 2006 class contained 12 groups consisting of 52 students. The 2007 class contained six groups consisting of 30 students. We describe how two collaborative pages for each of the groups are created and used by the groups for the group project. Survey results illustrated that 44 percent of the students in 2006 and 50 percent in 2007 agree Confluence is a tool for facilitating learning; 58 percent in 2006 and 50 percent in 2007 agree it is a tool for student activities; 52 percent in 2006 and 36 percent in 2007 agree it is a medium for reflective group interaction; and 38 percent in 2006 and 36 percent in 2007 want to see its application in other courses.

Introduction

Currently, 13 out of the 34 Commission on Accreditation for Health Informatics and Information Management Education (CAHIIM) health information management programs and 23 out of 173 CAHIIM health information technology programs are online. Because online students often reside at different locations, online collaboration tools incorporated into online courses can help both instructors and students to coordinate and communicate. We used wiki as such a collaboration tool in an online course and share our experiences and findings in this article.

Background

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.¹ 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.²⁻⁴ One such example is the Web site InnoCentive (www.innocentive.com), which provides an 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.⁵ Other early adopters have similar findings of the usage of wiki for educational purposes.⁶⁻⁹

Herein we report our experience using a wiki tool in an HIM undergraduate course. The results of a post-course survey are also reported.

Software

An enterprise wiki tool named Confluence (version 2.2.10; Atlassian; San Francisco, CA) was used in our experiment 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 API for extension and integration.

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 (version 6.3; Blackboard Inc.; Washington, DC). 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.

The Course

HIMA 3032, Record Documentation Systems, is an introductory course on the origin, content, and format of health records across the continuum of care. The purpose of the course is to help students achieve substantial understanding of the different types of documentation requirements for the various types of healthcare organizations. The students should be able to incorporate their wiki skills and have the ability to use state-of-the-art software in their careers. We also expected the students to acquire communication and teamwork skills from collaborating virtually using the wiki tool.

Confluence was used in the same course in both 2006 and 2007. The 2006 course had a total of 52 students, who were juniors and seniors. Of those, 47 (90 percent) were female, which is congruent with the demography of the HIM profession. The 2007 course had 30 students (juniors only), of whom 27 (90 percent) were female, which, again, is in line with the demography of the HIM profession.

Using Confluence for Group Project Discussions and Postings

One important component of the course is the final group project presentation. The project was purposely designed to facilitate learning through guided and independent research. Students followed the textbook, *Comparative Health Information Management*, as a template for understanding and explaining the flow of health information in various healthcare settings. Each chapter of the text discusses a different healthcare setting in which health information managers are found. Each group must address the following components in their presentation: introductions to the setting, regulatory issues, documentation, reimbursement and funding, information management, quality improvement and utilization review, role of the health information management professional, and trends.

Self-selected groups consisting of five or six students were formed at the beginning of the semesters. Confluence was used as an online platform for the students and the instructor to exchange thoughts regarding the group project presentation. Two pages—Discussions and Postings, and References—were set up on the Confluence site for each group. On the group's discussions and postings page, students set up their outline for the project, designating responsibilities and posting discussion when needed (see Figure 1). On the group's references page, students collaboratively documented the references they used in their final presentation (see Figure 2). Students used the pages on Confluence to continuously build the materials they needed for their final presentation.

The instructor used the Confluence site in two ways. First, the front page of the Web site could be used as a bulletin board to distribute announcements 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 modifying or even contributing to their work. Students can learn from the examples provided by the instructor without overwhelming e-mail exchanges. Figure 3 shows a post from the instructor on the wiki site's home page. By default, the "posted by" and "date and time" elements of a post are of different font type, size, and color from the main text to make them prominent for online reading. The "posted by" and "date and time" items are automatically added below the comments so the students can judge the age of the posting. The latest comments appear at the top of the page. As shown, at the bottom of each comment, there is a link for students to add threaded comments.

After-Class Survey

To assess the efficacy of using the Confluence wiki in online education, a five-question survey was distributed at the end of each course. The questions were adapted from a questionnaire developed by Williams and Jacobs for collecting feedback on a blog system used in their class.¹⁰ The five survey questions addressed the following: 1) at what level did Confluence assist the student with learning; 2) at what level did Confluence increase the meaningful intellectual exchange between students; 3) at what level would the student want to participate in a similar future activity; 4) at what level would the student want to see Confluence more widely used as a learning tool in future courses; and 5) the reasons for the student's like or dislike of Confluence. A five-point Likert scale from *strongly agree* to *strongly disagree* was used in the first four questions. The last question was an open-ended question.

Results

Data were collected from two years of the class. In the first year (2006) the class had both junior and senior HIM students, while in the second year (2007) the class had only junior students. The Confluence interface did not change during the two-year experiment. In 2006, 48 of the 52 students in the class responded to the questionnaire for a response rate of 92.3 percent. In 2007, 28 out of the 30 students answered the survey for a response rate of 93.3 percent; however, two students did not answer the last open-ended question. We report the survey results below.

1. *The wiki site as a medium for facilitating learning*

The average score for this question in 2006 was 3.30 (between agree and neutral) and the score in 2007 was 3.10 (between agree and neutral) (see Figure 4). Overall, 46 percent of the students agreed that the wiki site helped their learning in the class while 26 percent of them did not agree. Because the Blackboard server aggregated the data in the frequencies of each answer, we used the χ^2 test to analyze whether there was a statistically significant difference between the answers for years 2006 and 2007. Although the average score was lower in 2007 than in 2006, the difference is not statistically significant ($p = 0.106$).

2. *Confluence for student interaction*

Question 2 is about whether Confluence can be used as a medium for student interaction (see Figure 5). The majority of the students (55 percent) thought the site increased the intellectual exchange between students in the online class. In 2006, the average score was 3.43 (between agree and neutral) while the average score in 2007 was 3.07 (close to neutral from the positive side). The difference is not statistically significant using the χ^2 test ($p = 0.22$).

3. *Confluence for student reflection*

Question 3 investigated whether the students are interested in using the wiki site as a medium for reflecting their thoughts other than as an assessment tool (see Figure 6). Forty-six percent of the students admitted that they would participate in similar activities even not for the purpose of course evaluation.

The average scores were 3.42 (between agree and neutral) and 2.79 (between disagree and neutral) in 2006 and 2007 respectively. The difference between the two years, 0.63, is not statistically significant based on the χ^2 test ($p = 0.06$).

4. *Confluence used in future courses*

Overall, 37 percent of students accepted Confluence's role as a pedagogical tool and anticipated its wider usage in online teaching (see Figure 7). In 2006, the average score for this question was 3.21 (between agree and neutral), and the average score in 2007 was 2.61 (between disagree and neutral) in 2007. The contrast is statistically significant ($p = 0.01$) between the two years based on the χ^2 test.

Qualitative Analysis of the Open-ended Question

The last question on the survey is an open-ended question in which the students listed the reasons they liked or disliked using Confluence in the course. We conducted a content analysis on the free-text answers to the question in order to understand some of the common reasons for students' attitudes toward the software. We used the qualitative research software NVivo (version 7.0; QSR International; Doncaster, Australia) to explore common patterns in the students' answers.

We found five distinguishing patterns among the students who expressed positive attitudes toward the wiki software (see Table 1). Two patterns that appeared the most among the answers are communication (14 times) and collaboration (13 times).

We found seven distinguishing patterns in the negative responses to the open end questions (see Table 2). The most often cited barrier (13 times) to using the wiki tool is that the Web site is not very navigable for students to find the right location for their task. The second most often cited barrier (10 times) is that some of the software features are not intuitive so students cannot accomplish some of the intended tasks. Other noticeable barriers include lack of communication (nine times) and software complexity (seven times).

Discussion

We report a case study of using Confluence as a collaborative Web site for group projects in an HIM course. Half of the students agree that the wiki tool could help them to learn, interact, and reflect in the online class. Thirty-seven percent of the students would like to use it in future classes. Students liked the wiki tool because it facilitated collaboration and communication. Students disliked the tool because of the navigation difficulty, confusing software features, lack of communication in the group, and steep learning curve of the software.

We found that the students in 2007 in general had a more negative attitude toward using the wiki tool than students in 2006. In 2006, we had both junior and senior students in the class, and in 2007 we had only junior students. Junior students have had less immersion into the field of health information management than senior students. The unfamiliarity with the field may contribute to the negative attitudes in the second year's results.

The objective of the content analysis of the responses to the fifth question was to explore the reason for students' attitudes toward the wiki tool. Two frequently cited reasons are the power of the wiki tool for students' collaboration and communication. Some students cited "lack of communication" as one of the major reasons why they didn't like using the wiki tool. Some groups relied on e-mail to exchange their files because it was the mechanism used in their previous classes. This finding implies that it is imperative to integrate the wiki tool into the study flow of the students. The instructor may also want to emphasize that wiki tools are more of a collaborative tool than a communication tool. The other pattern cited in both positive and negative responses is the navigability of the system. This contradictory finding might suggest that the developers of the Confluence tool still need to improve its Web usability. This is also supported by other negative findings such as software complexity and steep learning curve.

According to AHIMA, 38 percent of accredited health information management programs are classified as “distance learning.” The major advantage of online education is that it separates pedagogy from distance and time restraints. However, previous studies pointed out that e-learning systems often lack the lure of social networking compared to classroom lectures and can cause disengagement from the students, especially when text-only materials are presented on the Web.^{11, 12} To overcome this barrier, many instructors employ an online discussion board as a platform for their students to engage in class activities.¹³ Students who are afraid of public speaking will have a chance to participate in the discussion, and students will have more time to organize their thoughts before they post them online. Wiki tools may help students to publish online without sophisticated knowledge of Web programming. This immediate publishing feature of the wiki offers opportunities for students and instructors to write online whenever they feel the urge. Students and instructors can view and edit each other’s work on the wiki site. One important finding is that some students disliked the wiki tool because they felt it was inconvenient to use different logins. If current commercial course management systems such as Blackboard and WebCT could have a wiki tool integrated into the system, the problem of multiple logins would be eliminated. This should be taken into consideration for future adopters.

The wiki in this course was used as a workspace for group members to draft and revise their final project presentation. This approach can facilitate peer learning because of the openness of the wiki. Peer learning is an important pedagogical component in higher education.¹⁴ 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. 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. To the instructor, wiki is a cost-efficient way to advise the maximum number of students online. The wiki system keeps all the postings for future reference. Students in the same group will be able to learn from the instructor when he or she updates the writings on the wiki server.

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 group members. Another benefit of using wiki 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. 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.

We used the commercial wiki tool Confluence in our study. Available tools range from free open-source software with only core wiki functions to enterprise wiki tools with slick interfaces and additional functionalities. We chose Confluence for this project because it provides a “walled garden” ecosystem for students in the online class to collaborate. A controlled wiki tool can prevent plagiarism when students work on the same project in different groups. Students expressed concerns about this in their answers to the open-ended question. Although such control may contradict the initial intent of wiki as a collaborative tool, it offers a balance between academic collaboration and independence in the education environment. We suggest that educators should take this balance into consideration when adopting wiki tools for their online teaching.

Wiki tools also have their limitations. Internet connections are needed when students access their work. With more installation of broadband and mobile connections, this limitation may be less of a concern in the future. The other limitation is that many wiki tools lack advanced functions provided by a desktop word processing tool. The instructor might suggest that students draft their content first on the wiki server and then format the final version using desktop word processing software.

Limitations and Areas for Future Research

There are several limitations in this study. The first limitation in the study is not being able to differentiate between the levels (junior or senior) of the students. The second limitation is that all participants are from the same university. Including students from other colleges or universities may emphasize likes and dislikes that were not included in this study. The third limitation is that the sample consisted predominately of white females.

Conclusion

Wiki, with its natural characteristics of supporting collaboration online, would be useful for HIM educators to include in their online teaching. Instructors have the responsibility to get students acclimatized to the tool before fully employing it in online teaching. Instructors should design the assignments or projects based on the strengths of the wiki tools.

The study is intended as a case study of an online HIM course. The sample size was drawn from convenience rather than for statistical significance. Although the results of the study may not be generalized due to the limitations of the sample size and the data collection instrument, if we consider other reports of using wiki in higher education, the wiki can be considered an effective tool for supporting online teaching.

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AHIMA does not support or endorse the products or services referenced in this manuscript.

Notes

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Figure 1

Discussions and Postings Page

Welcome to the HIMA Supremas. I look forward to working with each of you this semester. As indicated in the e-mail I sent to you earlier today, the project instructions on Blackboard indicate we are to now set up our outline for the project, designating responsibilities. Our presentation, which we will create based on information we post to our page in Wikipedia, will be evaluated based on how well it conforms to the template described in the project instructions on Blackboard. So I propose that we model our outline after the template, which is listed below in steps 1 through 9:

Project Outline

1. Introduction to the setting
2. Regulatory issues
3. Documentation
4. Reimbursement and funding
5. Information management (data flow, coding and classification, computer systems and data sets)
6. Quality improvement and utilization management
7. Risk management and legal issues
8. Role of the health information management professional
9. Trends
10. Conclusion

As you can see, I have also added a step #10, "Conclusion." Please note that after sending you an e-mail earlier today, I realized a conclusion is of course also needed. So, even though I previously indicated that since there are 5 of us, and 9 topics, we would need to select 1 to 2 topics each, we now need to each select 2 topics. I volunteer to take #10, the conclusion, as well as whichever topic remains after you as a group have made your selections.

Sincerely,

██████████

 Posted by ██████████ at Jan 14, 2006 14:47 | [Permalink](#) | [Remove](#) | [Reply To This](#)

Hi everyone. I would like to take #8 and #9. If that's ok with the group.

 Posted by ██████████ at Jan 15, 2006 16:23 | [Permalink](#) | [Remove](#) | [Reply To This](#)

Figure 2

Reference Page

Peden, Ann H. "Dental Care Settings," Ch. 14. "Veterinary Settings," Ch. 15. "Consulting," Ch. 16. *Comparative Health Information Management*. 2nd ed. Canada: 2005.



Posted by [REDACTED] at Feb 13, 2006 13:42 | [Permalink](#) | [Remove](#) | [Reply To This](#)

Merriam-Webster Online. <http://www.m-w.com>. accessed February 27, 2006.



Posted by [REDACTED] at Feb 28, 2006 09:32 | [Permalink](#) | [Remove](#) | [Reply To This](#)

Pediatric Dental Care Record Documentation. <http://columbia.edu.../peds-cd/contents/syllabus/charting-criteria.html>. accessed February 27, 2006.



Posted by [REDACTED] at Feb 28, 2006 09:37 | [Permalink](#) | [Remove](#) | [Reply To This](#)

Figure 3

Postings by the Instructor

Hello Everyone. A student has asked a question about the format/layout of the project on the different pages on the Wiki Site - particularly about the research and references information. See my response below.

You should use the two pages for your group project. Your group should discuss/share ideas on the 'Discussion and Postings' page and list your references on the reference page. With the end product being one PowerPoint presentation per group, you can use the attachment function on the site to work on the .ppt file. You should also list your references on the last slide of your presentation.



Posted by [REDACTED] at Jan 19, 2006 11:07 | [Permalink](#) | [Remove](#) | [Reply To This](#)

Just a thought on references: You may want to contact a manager or supervisor at a facility/office, etc and use them as a reference on your project. This is not required but may be helpful.



Posted by [REDACTED] at Jan 20, 2006 16:54 | [Permalink](#) | [Remove](#) | [Reply To This](#)

Figure 4

The Wiki Site as a Medium for Facilitating Learning

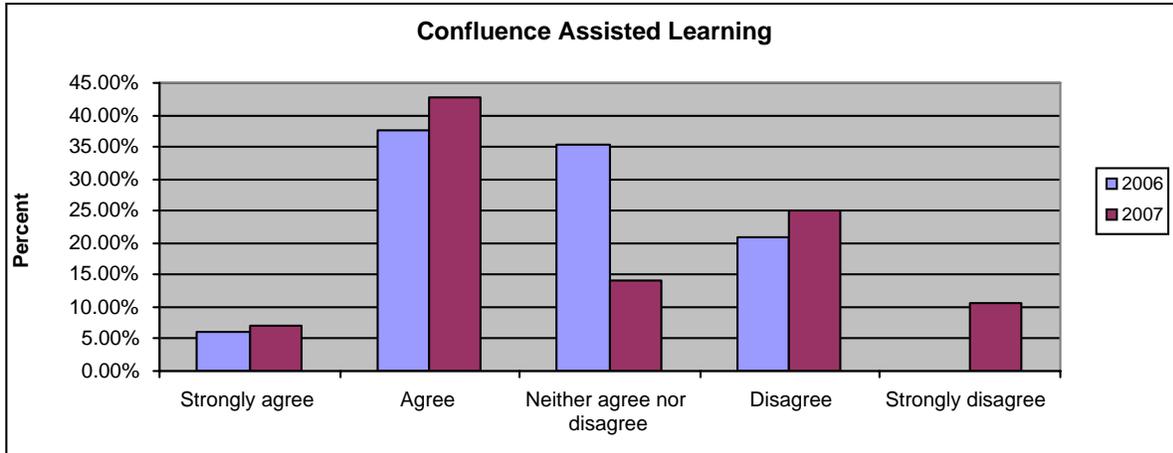


Figure 5

The Wiki Site as a Medium for Student Interaction

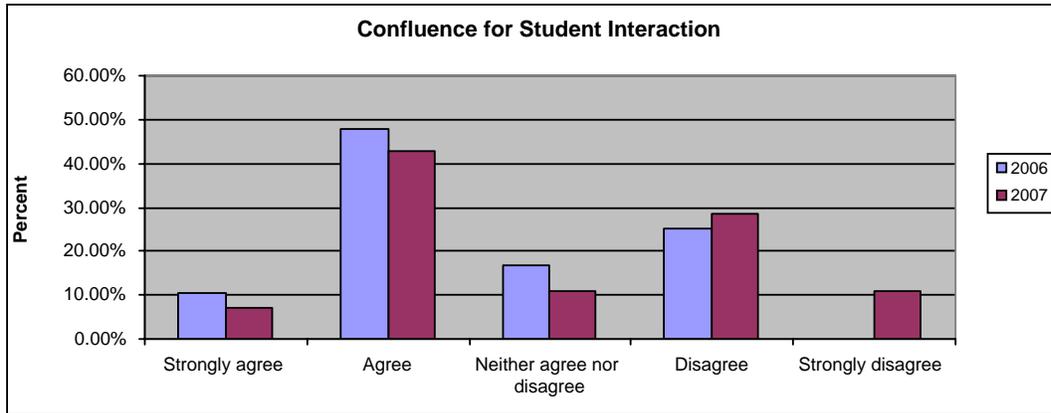


Figure 6

The Wiki Site as a Medium for Reflection

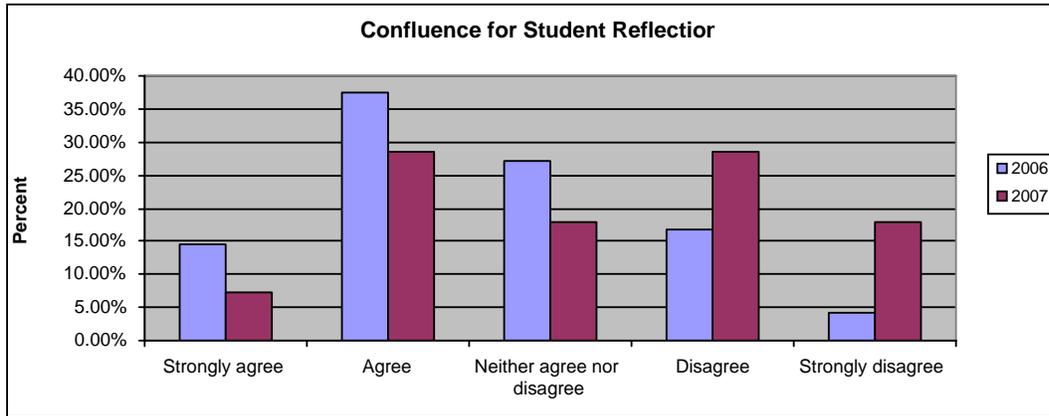


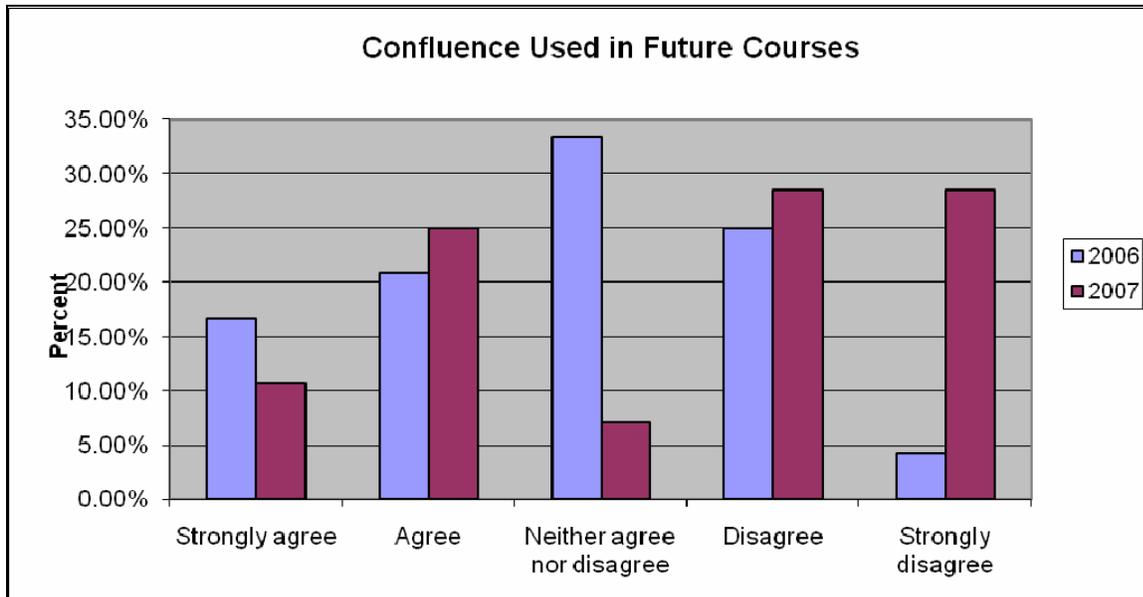
Figure 7**The Transferability of the Wiki Site as a Learning Tool**

Table 1**Distinguishing Patterns Found in the Positive Answers**

Patterns	Frequency	Sample quotes
Communication	14	"[I]t was useful in communicating with just the group members."
Collaboration	13	"I think that Confluence is good in the event of a group project where you can post different parts of a paper, Powerpoint slides or references, as we did."
Knowledge acquisition	3	"I liked using Confluence because I learned how to use something new."
Software features	3	"The option that allowed attaching and posting of documents was extremely helpful."
Navigation	1	"It was easy to navigate."

Table 2**Distinguishing Patterns Found in the Negative Answers**

Patterns	Frequency	Sample Quotes
Hard to navigate	13	"I honestly did not completely understand how to navigate through the system."
Confusing software features	10	"The site is kind of confusing though. I still don't know how to add an attachment."
Lack of communication	9	"I didn't like using confluence because I didn't feel as if there was any communication between me and other members."
Hard to learn	7	"[f] Confluence were introduced earlier when the courses are less time consuming, students would have more time to become acquainted with it."
Require additional login	4	"I already have several sites to log into each day."
Lack of user interaction	4	"I had difficulty getting my group to participate in the wiki discussions regularly."
Inconvenience	3	"Sometimes I would forget about the site and not post anything."