Incorporating Wikis in an Educational Technology Course: Ideas, Reflections and Lessons Learned …

Andri Ioannou & Anthony Artino
University of Connecticut
United States
andri.ioannou@uconn.edu,
tony_artino@yahoo.com

Abstract

The use of wikis in education is a relatively new phenomenon. Although empirical research in this area is limited, wikis appear to be powerful tools, capable of promoting collaboration, knowledge creation and knowledge sharing. This paper outlines how a wiki was used with 24 students enrolled in an Educational Technology introductory course, in an effort to promote collaborative learning and knowledge sharing. Wiki activities are described in sufficient detail to allow new instructors to use them in their courses. Preliminary observations, reflections, and lessons-learned are included.

Introduction

The use of wikis in education is a relatively new phenomenon. Although empirical research in this area is limited, wikis appear to have the potential to facilitate collaborative work among students not only in local settings, but also globally. This paper outlines how a wiki was incorporated into a course on educational technology in the fall of 2007, in an effort to promote collaborative learning and knowledge sharing.

What is a Wiki?

The largest and perhaps most well-known wiki is Wikipedia. Today, and only six years after its first appearance, Wikipedia is one of the top 10 most-visited websites in the world. It holds 7.5 million articles in approximately 250 languages, with more than 2 million pages in English (Wikipedia, 2007).

Simply, wiki websites allow every authorized user to become an editor of a given topic—to edit content and add new pages—at any time and from any location. All a user needs is a web browser and Internet connection; no special software or knowledge of HTML is required. Wikis are very simple to learn and use; most users can begin editing wiki pages within 5-10 minutes of their initial introduction to them (McMullin, 2005). Wiki pages can be recognizable by the appearance of a button or link labeled "edit this page," which invites readers to freely modify the content of the page (McMullin, 2005). Once a wiki page is edited, it is instantly visible to other users. Wikis put no boundaries between authors, editors, and readers; there is no one "expert" who delivers knowledge on a topic, and there is no "webmaster" who has centralized control over the website. Wikis are authored by communities and allow community members to work together productively to negotiate meaning. Wikis aim to provide an accessible way to publish, collaborate, and exchange ideas over the web (Dalke, Cassidy, Grobstein, & Blank, 2007).

Wiki implementations vary in terms of controls and access. Some wiki systems are completely public, permitting page editing by anonymous users (e.g., Wikipedia). Other wikis may be private, limited to closed groups of authorized users. In any case, wikis have facilities to record and track modifications. Thus, community members can monitor changes; see how the documents evolve; know who made alterations (login information is collected for private wikis; IP address is collected for public wikis); and restore previous versions of pages or delete unwanted pages if necessary (Chawner & Lewis, 2006). This "recoding" capability also helps understand the evolution of thought and discourse as students keep adding, editing, and deleting material on the wiki. A critical feature of wikis is that they incorporate "notification" or "alert" features, which give users the option of receiving automatic reports when certain articles are modified or new articles are created on a certain topic (McMullin, 2005). This feature makes collaboration very effective as community members can immediately monitor and respond to each other's contributions.

Theorizing Wikis

We place wikis in the context of current literature on collaborative learning. Collaborative learning as a model is consistent with a social constructivist pedagogy, which views learning as active, reflective, and social (Brown & Campione, 1994). That is, constructing understanding is not an isolated activity, but occurs within the framework of a learning community. Collaborative learning as a method is learner-centered rather than teacher-centered and knowledge construction is facilitated by peer interaction, evaluation and cooperation (Johnson, Johnson, & Holubec, 1993). Research has shown that collaborative learning methods are more effective in promoting student learning achievement, and engagement (Hannafin & Land 1997; Hiltz, 1993; Johnson, Johnson, & Holubec, 1993), compared to traditional methods that assume students "learn" passively, by receiving and assimilating knowledge individually. Collaborative learning is found to lead to deeper level learning, critical thinking, more frequent generation of new ideas and solutions, long term retention of the learned material, and greater transfer from one situation to another (Garrison, Anderson, & Archer, 2001; Johnson, Johnson, & Holubec, 1994). Through collaborative learning students learn to share responsibility and to work with people of different skills and backgrounds for the success of the group (Johnson, Johnson, & Holubec, 1994). Last but not least, collaborative learning is found to help students develop social and communication skills and positive attitudes towards co-members and learning material (Johnson & Johnson, 1999).

Because the use of wikis in education is a relatively new phenomenon, there is little empirical literature in this area. Nevertheless, wikis - as technological tools - appear to be powerful, capable of promoting collaboration (e.g., Rick & Guzdial, 2006), knowledge creation (e.g., Richardson, 2006), and knowledge sharing (e.g., Bruns & Humphreys, 2005). The collaborative nature of wikis seems to allow students to participate in the creation of knowledge and information and to feel the joy of being “part of the process” (Richardson, 2006, p. 74). However, not every previous attempt to adopt a wiki in the classroom has been successful (e.g., Blank et al., 2007; Rick & Guzdial, 2006).

The Course Design

The wiki was incorporated in an introductory course on educational technology at a large public university in the Northeast US. The 1-credit course is required for all undergraduates in the teacher preparation program. During the second week of classes and till the end of the semester students and tutors (teaching assistants) met in 90-minute lab-sessions of 12 students each. The wiki was used for the two lab-sessions that the first author was tutoring (total of 24 students). A different wiki site was set for each lab-session. Both wiki sites were developed using a free wiki software, called PBwiki. There was no specific reason for choosing PBwiki; a variety of wiki software is freely available on the Web and share similar sets of functionality and features.

The wiki was introduced on the fist lab-session and was used throughout the semester (total of 14 weeks) for several activities. A new wiki page was created for each new activity. The wiki was set to be private; meaning only students in the lab-session (who shared the password) could access and edit the wiki pages. Because students had to login to edit the wiki, every post or edit could be attributed to an individual student. Students were aware that any changes on the wiki space could be traced back to them. In addition to the wiki, students used other technologies such as, threaded discussion forums (in WebCT Vista), email, instant messenger, GoogleDocs, and the Web, as part of their course.

Wiki Activities and Preliminary Observations

Several activities took place on the wiki space; some were designed and planed by the instructor, whereas others were initiated by the students. The activities are presented in roughly chronological order. Based on observations and students’ verbal feedback, adaptations were made to every next activity in order to improve the collaborative use of wikis.

1) *Wiki as an icebreaker*. During the first week of class, students were encouraged to edit the class’s wiki profiles page, initiated by the instructor. They uploaded photos of themselves, posted their preferred email address, and wrote a few brief sentences about themselves such as, personal and academic interests, focus in the teacher preparation program, and academic background. Our observations indicated that students responded well to the exercise. All 24 students participated in this activity voluntarily. Students learned about their classmates, and familiarized themselves with editing wiki pages. The activity also helped the tutor learn students’ names early in the semester.

2) *Wiki as a collaborative writing tool*. Students were asked to collaborate in groups of 3-4 on crafting summary paragraphs related to the National Educational Technology Standards (NETS) for teachers. A new wiki page was created for each group, but groups were able to look at other groups' wiki pages. The instructor posted skeletal notes of the six areas of the NETS on each group's wiki page[1]. Students were encouraged to first explore NETS on the Web (relevant links were provided); then, they were asked to work collaborative to compose detailed explanation paragraphs for each standard, and to provide concrete examples of how teachers may demonstrate their understanding of these standards through their teaching practices.

Although this activity was indented to be collaborative, students were rather cooperative (see also Dillenbourg, 1999; Smith, 1996). Most of the work was completed individually. Students crafted paragraphs independently, which they then posted on their group's wiki page. None edited each others' postings. Nevertheless, all groups completed the activity successfully.

3) *Wiki as a knowledge database*. Students were asked to collaborate as a class (and with the tutor's support) to build a database of knowledge on emerging technologies. Students were asked to identify and define kinds of emerging technologies and to provide examples of how these technologies can facilitate teaching and learning. The database was not limited to technologies discussed in class. For this activity students received direct instructions that they had to work together on each entry to edit and to improve it together.

This time the degree of collaboration was a bit higher, taking better advantage of the collaborative writing and peer editing affordances of the wikis. Students identified and defined several emerging technologies[2]. Other students added new explanations to the definitions. Several examples of using each emerging technology in the classroom were posted by different students. However, it became evident that learners more often identified and defined a new technology, or created extensions of definitions or examples, than they improved or edited their classmate's contributions. Once again, the learners did not really engage in the desirable collaborative learning.

Observations for the last two types of activities are consistent with the findings by Lund and Smørdal (2006). The researchers had used a wiki with 32 secondary school students in an English as a foreign language class to support collective knowledge building while students practiced their language skills. They discussed how teachers play a key role in the success of using a wiki to build knowledge collaboratively. They explained that teachers should keep reminding students to concentrate on the collective improvement of some wiki space and to be parsimonious about expansion (Lund & Smørdal, 2006). Similarly, Rick and Guzdial (2006) who used wikis in college engineering classrooms stressed out the importance of faculty to be supportive of collaboration, and to convey to students why they should collaborate, in order for the wiki activities to be successful.

4) *Wiki as communication tool*. Although not intentionally, the wiki served as a class communication tool. Probably due to the quick and easy editing, as well as the built-in "notification" features, students preferred to use the wiki for communication over the WebCT Vista threaded discussions and announcement feature. Students initiated the use of the wiki to share interesting resources they found about topics we had discussed in class and for questions about their class projects.

Given the popularity of the wiki as a communication tool, a wiki page was soon dedicated for frequently asked questions and announcements. Students posted questions concerning their class projects[3] (e.g. How do I submit my portfolio for feedback to the instructor? How do I get music to play when my webpage loads on the browser?) They sometimes answered each other's questions, but in general this was left for the instructor to do.

5) *Wiki for feedback/ exchange of ideas*. Students were encouraged to share the URLs to their in-progress websites to get feedback from each other and from the instructor. Approximately 90% of the students actively participated in this activity, by commenting on their classmates websites, by suggesting revisions (e.g., suggesting that some text color does not read well on the chosen background color), or by asking questions (e.g., How did you do the flash button?). Students were also encouraged to use the wiki as they see fit to facilitate their collaboration concerning their assignments. Some used it to share ideas for things to include on their personal websites and TaskStream e-folios. Some posted resources such as freely-available website templates on the Web, links to previous students' personal websites, and links to completed TaskStream e-folios from previous students. These activities highlight the social and constructivist nature of wikis and their ability to facilitate knowledge sharing and communication.

---

[1] NETS for Teachers: 1.Technology operations and concepts, 2. Planning and Designing Learning Environments and Experiences, 3. Teaching, Learning, and the curriculum, 4. Assessment and Evaluation, 5. Productivity and Professional Practice, 6. Social, Ethical, Legal, and Human Issues.

[2] e.g Wikis, RSS feeds, Podcasts, Google Dogs, Educational Games and Simulations

[3] The class projects included: 1) a personal website in Adobe Dreamweaver, 2) an e-folio in TaskStream, and 3) a team-based video production using i-movie.

6) *Wiki for activity planning*. One of the class projects was to produce a 3-minutes video clip related to classroom uses of educational technology. Students had to script the scenario, act, direct, and edit the clip. The video-shooting and editing had to be completed during two lab sessions, using lab equipment (cameras, tripods, projector, assistive technology, smart-boards, computers, est.). For this activity, students worked in groups of 4-6. Each group had a wiki page set to facilitate their collaboration on the video project. The tutor provided skeletal notes of the things students needed to make decisions ahead of time, such as title of the video, cameraman, lighting, actors/actress, place for each scene, script of the dialog, video editing effects and music.

Groups provided a clean script of the dialog and other details on their groups' wiki pages. The interaction on the wiki pages was minimal; in general, only final edits on the script and other details were made after the initial draft was posted. Personal communication with students revealed that all the groups met face to face to plan for the video project; then, a member of the team posted the details on the wiki page for the tutor to monitor. Although the online collaboration on the wiki page was limited, students completed the exercise to a satisfactory level by simply working face-to-face. This observation is consistent with Carr, Morrison, Cox, and Deacon's (2007) experience with using wikis to facilitate collaborative writing within student groups in an undergraduate political science course. Through survey evaluations and interviews the researchers found that two of the main reasons students did not collaborate on the wiki were either because they preferred to work on their essays at the last minute, or because they simply preferred working face-to-face. It would be interesting to examine whether wikis are more useful collaborative tools in cases where distance is a true barrier for students to meet face to face.

7) *Wiki as collection and reflection tool*. Although we did not use the wiki for this kind of activity, it should be interesting to implement in future attempts. Wikis can be used for note sharing and reflection on action. Students sitting in the same lecture do not necessarily leave with the same level of understanding. Asking students to type and edit each others' notes and reflections on a wiki page might be a useful means of engaging them, especially for students who are not effective note takers. In other words, students can create a set of wiki documents that reflect the shared knowledge of the learning group (Augar, Raitman, & Zhou, 2004). In such a case, the instructor should be responsible for addressing misconceptions. This use of a wiki page could further serve as a class archive for students to revisit later in the course. A model of such an activity was done by O'Neill (2005) who used a wiki site in a computer science course to facilitate collaborative note taking as opposed to distributing lecture slides. The instructor placed skeletal lecture notes onto a Wiki site and encouraged students to flesh out that skeleton. She found that this practice created high-quality lecture notes and provided the instructor with valuable feedback on what students had understood.

8) *Wikis for games*. Wikis would allow students to collaborate in online games, such as crosswords, puzzles, or quests. For instance, a crossword related to emerging technologies would challenge students to identify technologies based on a description of a set of attributes and characteristics. Unfortunately, we did not have time to utilize wikis in this creative way during the semester; however such activities should be fun and educational. On the other hand, a wiki could be used as a construction kit to engage students in collaborative construction of a database of fun game-activities. Students could work in groups (and with their tutor's support) to built crosswords, puzzles, quests, or other activities related to the topics of the course, for the future students.

Reflections and Lessons-learned

One of the most valuable benefits of wikis appears to be the quick and easy self-creation of content by users that allows students to work together on a variety of activities. However, observations support that "working together" was not necessarily collaborative in nature, but rather cooperative, if not individualistic. Students did not engage in collaborative learning as a result of using a wiki; instead they "continue[ed] a practice where the institutionally cultivated individual ownership persist[ed]" (Lund & Smørdal, 2006, p.41). Rather than working together to accomplish a common learning goal (e.g., Dillenbourg, 1999), students often practiced individual accountability and group processing, characteristics of cooperative learning (Smith, 1996). Apparently, it is essential that the instructor actively monitors, prompts, and fosters collaboration by encouraging students to edit texts created by other users (e.g., Elhasid-Tal, and Meishar-Tal, 2007; Lund & Smørdal, 2006). On the other hand, wikis might be more useful tools, capable to facilitate collaboration, in cases where students do not have the choice to meet face to face. A wiki might be more suited for inclusion in an e-learning environment.

It should be pointed out that students' participation on the wiki activities was very fairly leniently scored, because of the experimental nature of the wiki activities. There was not a percentage of class credit dedicated to the wiki participation. Had students participated and made contributions to the wiki activities they received credit

towards their overall class participation credit[4]. The lack of credit associated with the wiki activities might be another reason for the limited collaboration. Based on their experiences with integrating wikis into 13 different courses at the Open University of Israel, Tal-Elhasid and Meishar-Tal (2007) discussed that to increase collaboration the instructor should give weight to the collaboration level in grading the wiki activities.
Finally, a couple of technical difficulties may have impacted student use of the wiki. The tutor is aware that the wiki run quite slow at times, and saving the edits on a page was taking a few minutes. This may have caused some frustration, making students reluctant to invest more time on the wiki activities.

This manuscript was intended to provide ideas for using wikis in college courses, as well as to describe the tutor's preliminary observations, reflections, and lessons learned. To gain deeper insight concerning student use of the wiki, we would have needed to gather and analyze content of written wiki pages, log files (information about the number of logins and messages by users), history of wiki pages (patterns of use and workflow), and data from student evaluation surveys and interviews. It is important that future researchers gather and analyze such data in order to better understand whether wikis, and the instructional methods related to their use, can positively impact collaborative learning and knowledge sharing. A better understanding of the affordances of wikis will lead to a more systematic application of their use to support teaching and learning.

[4] The overall class participation credit was 25% of class grade and included attendance, contributing to the team-based video project, and active participation in class, WebCT threaded discussions, wiki activities, and GoogleDocs activities.

References

Augar, N., Raitman, R., & Zhou, W. (2004). Teaching and learning online with wikis. Paper presented at the Beyond the Comfort Zone, ASCILITE Conference, Perth, AU. Retrieved October 20, 2007, from http://www.ascilite.org.au/conferences/perth04/procs/pdf/augar.pdf

Brown, A. L., & Campione, J. C. (1994). Guided discovery in a community of learners. In K. McGilly (Ed.), Classroom lessons: Integrating cognitive theory and classroom practice (pp. 229-270). Cambridge, MA: MIT Press.

Bruns, A. & Humphreys, S. (2005). Wikis in teaching and assessment: The M/Cyclopedia project. Proceedings of the 2005 International Symposium on Wikis, San Diego, CA, U.S.A.: October 20 16-18, 25-32. Retrieved October 20, 2007, from http://snurb.info/files/Wikis%20in%20Teaching%20and%20Assessment.pdf

Carr, T., Morrison, A., Cox, G., & Deacon, A. (2007). Weathering wikis: Net-based learning meets political science in a South African university. *Computers and Composition, 24*(3), 266-284.

Chawner, B., & Lewis, P. (2006). WikiWikiWebs: New ways to communicate in a web environment. *Information Technology and Libraries, 25*(1), 33-43.

Dalke, A., Cassidy, K., Grobstein, P., Blank, D. (2007). Emergent pedagogy: learning to enjoy the uncontrollable - and make it productive. *Journal of Educational Change, 8*(2), 111-130.

Dillenbourg, p. (1999). What do you mean by collaborative learning? In collaborative learning, cognitive and computational approaches. Elsevier, Oxford, 1-19.

Garrison, D.R., Anderson T., & Archer, W. (2001). Critical thinking, cognitive presence, and computer conferencing in distance education, *American Journal of Distance Education, 15*(1), 7–23.

Godwin-Jones, R. (2003). Blogs and Wikis: Environments for on-line collaboration. *Language Learning and Technology, 7*(2), 12-16.

Hannafin, M.J., & Land, S.M. (1997). The foundations and assumptions of student-centered learning environments. *Instructional Science, 25,* 167-202.

Hiltz, S.R. (1993). Correlates of learning in a virtual classroom. *International Journal of Man-machine Studies, 39,* 71-98.

Hiltz, S.R., & Goldman, R. (2005). Learning together online: Research on asynchronous learning. Mahwah, NJ: Erlbaum.

Johnson, D. W., & Johnson, R. (1999). Learning together and alone: Cooperative, competitive, and individualistic learning. Boston: Allyn & Bacon.

Johnson, D. W., & Johnson, R. T. (1996). Cooperation and the use of technology. In D. Jonassen (Ed.), Handbook of research for educational communications and technology (pp. 785-812). London: MacMillan.

Johnson, D. W., Johnson, R. T., & Holubec, E. J. (1993). Cooperation in the classroom (6th ed.). Edina, MN: Interaction Book Company.

McMullin, B. (2005). Putting the learning back into learning technology. In S. Moore, G. O'Neill & B. McMullin (Eds.). Emerging issues in the practice of university learning and teaching (pp. 67-76). Dublin: AISHE. Retrieved October 20 2007, from http://www.aishe.org/readings/2005-1/mcmullin-D01-M10-2004.pdf

O'Neill, M.E. (2005). Automated use of a wiki for collaborative lecture notes. Proceedings of the 36th SIGCSE technical symposium on computer science education, St. Louis, Missouri, USA: February 23–27, 267-271.

Richardson, W. (2006). Blogs, wikis, podcasts, and other powerful web tools for classrooms. Thousand Oaks, California: Corwin Press.

Rick, J., & Guzdial, M. (2006). Situating CoWeb: A scholarship of application. *International Journal of Computer-Supported Collaborative Learning, 1*(1), 89-115.

Smith, K. A. (1996). Cooperative learning: Making "groupwork" work. New directions for teaching and learning, 67, 71-82.

Tal-Elhasid E. & Meishar-Tal H. (2007). Wikis in academic courses: Models of usage and collaboration, In Eshet, Y., Caspi, A., and Yair, Y. (Eds.) Learning in the technological era (pp. 127-136). Chairs Conference on Instructional Technologies Research, Ra'anana: Open University of Israel. (Hebrew)

Wenger, E (1998). Communities of Practice: Learning, Meaning, and Identity. New York: Cambridge University Press.

Wenger, E. (2000). Communities of Practice and Social Learning Systems. *Organization, 7*(2), 225-256.

Wikipedia (2007). Wikipedia, the free encyclopedia. Retrieved October 20, 2007, from http://en.wikipedia.org/wiki/2007