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The Wiki's Role in Constructing a Research Agenda in Preservice Teacher Education*

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Abstract

The proliferation of emerging online technologies and especially those associated with collaboration have posed both opportunities and questions. Emerging tools such as the “wiki” maintain great potential in the academy to increase communication and collaboration between researchers from various higher education institutions across the United States, and even the world. This paper provides background and an example, aimed at assisting researchers and educators to assess the effectiveness of a wiki in collaborative research.

The Wiki’s Role in Constructing a Research Agenda in Preservice Teacher Education

The proliferation of emerging online technologies, such as the collaborative wiki tool, has posed both opportunities and questions. The “wiki” (wiki means “quick” in Hawaiian), has great potential in the academy to increase communication and collaboration between researchers from various higher education institutions across the United States, and even the world. This paper explores the potential for using a wiki as the tool to conduct online discussion and collaboration

The Collaborative Potential of a Wiki

The first wiki was created by programmer Ward Cunningham in 1995 in response to the perceived need for fellow programmers to communicate more efficiently (Oatman, 2005). Prior to the development of the wiki, groups relied upon phone conferencing, email, and face-to-face meetings, but these avenues did not help to create the collaborative community Cunningham sought. A wiki is open source software that enables any person to create, edit, manage, and maintain web content. Several wiki software services, such as Wikispaces (<http://www.wikispaces.com>) and PBwiki (<http://pbwiki.com>), offer free wiki accounts online, with the option to access more features by paying a low monthly fee. Proponents and supporters of wikis believe that wikis “are good for collaboration and sharing content” (Fichter, 2005, p. 49). In addition, users of the software speak of the wikis’ ability to “enable and empower multiple users to collaborate whenever and wherever” (Wagner, 2004, p. 277) on the same project or group of documents, thus creating a never-ending collaborative work space. Other software tools such as online discussion boards and blogs offer the capability to communicate, but they are not designed to encourage project collaboration. With the advent of the Internet technology age and its ability to increase interaction, collaboration, and communication, technologies such as the wiki will continue to encourage knowledge sharing and creation and social interaction, while contributing to an increasingly interconnected world.

Wikipedia: A Case for Criticisms of Wikis

As with other online tools, observers have criticized wikis for several reasons, including content inaccuracies and editing issues. The open source nature of wikis, combined with the fact that anyone, regardless of background, can edit and contribute to wikis has largely been responsible for such criticism. The most popular and best known wiki, *Wikipedia*, has certainly experienced its share of negative press. Wikipedia, the online encyclopedia, began its existence in January 2001 under the leadership of Jimmy Wales (Wikipedia.com, 2008a). Since then,

Wikipedia, the ultimate open source encyclopedia, has garnered so much popularity that as of early 2008 there were over 6 million registered user accounts (Wikipedia.com, 2008b) and over 7.5 million articles written in close to 250 different languages (Wikipedia.com, 2008a). Despite such success, Wikipedia has received criticism because it is a large repository of information open to editing by anyone. Wikipedia has earned so much scrutiny that an entire organization has formed to watch over the encyclopedia; this group is aptly named Wikipedia Watch. The group monitors Wikipedia for instances of plagiarism, inaccurate content, and potential abuses by administrators. For smaller groups of collaborators, however, wiki software providers (e.g. Wikispaces and PBwiki) provide security measures through private spaces viewed and edited by members only.

Watchdog groups notwithstanding, former allies also have questioned Wikipedia. Larry Sanger (2004), who claims he co-founded Wikipedia and left the company in 2004, points out three potentially damaging communication problems in developing wikis. The first problem is the “lack of public perception of credibility, particularly in areas of detail” (Sanger, 2004, p.1). In Sanger’s opinion, it is not that information is inaccurate, but that the information is perceived as being inaccurate. He further notes that Wikipedia, and by extension wikis, are dominated by “difficult people, trolls, and their enablers” (Sanger, 2004, p.1). Trolls, people who post derogatory or inflammatory comments to bait users into responding, pose problems with wikis (Webopedia.com, 2007). In any collaborative environment, the potential for certain individuals to create problems and/or to incite group strife can be problematic. The very reasons for developing open nature software will always present such opportunities for individuals, such as trolls, who are dedicated to corrupting posted content. Sanger points out an equally important problem facing Wikipedia in that the company maintains an anti-elitist viewpoint in the sense that “expertise is not accorded any special respect, and snubs and disrespect of expertise is tolerated” (Sanger, 2004, p. 1). The established purpose of Wikipedia, to create a free online encyclopedia with contributions from the average person, has become, in a sense, its greatest liability.

Without input or assistance from academic experts and researchers, Wikipedia has struggled to gain legitimacy as a valuable information source in the academic community. Efforts have been made to improve the encyclopedia’s standing. In 2005, the scientific journal *Nature*, a highly regarded weekly journal first established in 1869, asked scholars to independently examine the accuracy of online science content within 50 pairs of articles in Wikipedia and Encyclopedia Britannica Online. Scholars were not aware of the source of each article examined. The study found the difference in accuracy between the two encyclopedias to be relatively small, with Wikipedia logging an average of four inaccuracies per entry and Britannica averaging three per entry (Giles, 2005). It must be noted, however, that Britannica disputes these findings (Encyclopaedia Britannica, Inc., 2006). *Nature* has since issued its own point-by-point rebuttal to Britannica’s list of complaints (Nature.com, 2006).

Despite such studies, the continuing public debates over Wikipedia and its validity have damaged the public’s perception of wikis. As with other popular technologies introduced (wasn’t the value of the Internet questioned at one time?), it is probable that the wiki will continue to have its critics.

Who is Using Wikis?

Business and Industry. Wikis are increasingly popular, especially in the business world. Typically, employees require a convenient outlet to document group progress, record meeting notes, and store documents. In addition, such an outlet must be responsive to employee needs, as typical corporate-run websites are not updated fast enough to meet these needs. The wiki, on the other hand, can be updated any time and from anywhere, as long as one has a computer and internet access. “Wikis are structurally capable of handling conversation, but it’s not their forte; instead wikis excel at collaboration” (Goodnoe, 2005, p. 54-55). Blogs and email are more appropriate for conversation between employees, but the wiki is ideal for group cooperation and collaboration.

Wikis have little to no start-up costs, and maintain a substantially low learning curve. Wikis, moreover, are inherently collaborative, as “users, not administrators control the wiki” (Goodnoe, 2005, p. 58). With wikis, group members can take initiative to create their own space. A survey by the Gilbane Report of 73 companies revealed that small businesses (the report identified small businesses as having less than \$25 million in revenue) were experimenting more with wikis than were their larger competitors (Goodnoe, 2005). A wiki designed specifically for small businesses can be found at SmallBusiness.com (SmallBusiness.com, 2007). Goodnoe further notes that several large companies are getting into the act, among them are Nokia Corporation, Yahoo Inc., Michelin China, Disney, Cingular, Kodak, and Motorola.

For various reasons, not all businesses are quick to adopt the wiki. Many organizations rely upon company controlled Intranets which regulate top-down dissemination of information to employees. In such circumstances, Wikis would certainly not play a role in collaboration or knowledge management (Wagner, 2004). In the context of collaboration and communication among education professionals, however, where top-down information dissemination is not always necessary, wikis serve as a possible tool for knowledge creation and sharing. Still, significant apprehension exists in the corporate world concerning the adoption of technologies such as blogs and wikis. According to Scott (2006), this apprehension stems from the belief that employees will reveal company secrets or perhaps use the technologies in inappropriate ways. Scott (2006), however, says that the real issue is trust in people, not trust in the technology. Gilbane states that wikis and blogs “are often replacing intranets” (as cited in Scott, 2006, p. 48). In other words, company employees are replacing older technologies such as intranets with newer tools such as blogs and wikis (commonly referred to today as Web 2.0 tools). These employees use Web 2.0 technologies to communicate with each other, share information and data, store documents, plan projects, and collaborate on shared ventures.

In the scientific community, Wikis such as WikiProteins and Science Environment for Ecological Knowledge (SEEK) have been developed to foster science inquiry, community, and collaboration (Science Environment for Ecological Knowledge, 2007; WikiProteins, 2007). In the medical world, Wikis such as AskDrWiki encourage collaboration among experts from the various medical professions (AskDrWiki, 2007).

Education: The Academy. Not surprisingly, wikis have entered into education. For example, the MIT Engineering and Science Libraries B-Team uses a wiki to store their minutes, findings, news, links, and references (Fichter, 2005). At The Pennsylvania State University (Penn State), instructors of CAS 100B: Effective Speech incorporated a wiki into its fall 2006

course, with the wiki acting as the primary course work space (CAS 100B, 2006). At Boston College, Dr. Gerald C. Kane used a wiki as the primary meeting place and collaborative working environment for his course, MI 021: Computers in Management (Kane, 2007). Similarly, author and professor, Howard Rheingold also implemented a wiki into his course, Communication 182/282: Virtual Community and Social Media, at Stanford University and the University of California, Berkeley (Rheingold, 2007).

In another example, the Amarillo Independent School District, Texas, decided to create an electronic version of its curriculum, something it could “distribute, edit and modify” (Waters, 2007, p. 40). The district decided to use Blackboard, but add-on tools called Team LX developed by Learning Objects created the functionality they required (Waters, 2007). The curriculum team moved documents requiring further revision to the wiki, and district curriculum specialists monitored the changes (Waters, 2007). Applying the wiki to the existing electronic curriculum, the curriculum assessment team collaborated together to make curriculum adjustments, updates, and changes. Such flexibility and ease of use was necessary for the curriculum assessment committee, since the committee was composed of teachers from different schools, with one teacher as representative for each campus. Ultimately, the wiki made using input from teachers more convenient and inclusive (Waters, 2007).

One school district has gone even further, by including an entire community in their wiki. In North Carolina, Carteret County Schools used a wiki to place a working document of their five-year technology plan online and invited input from teachers and administrators from across the United States (Warlick, 2007). Additionally, the wiki also was advertised in the local newspaper, and the community was asked to provide input as well. Such efforts led to a technology plan which included ideas from a range of academic personnel and community members (Warlick, 2007).

Primary and Secondary school teachers also have begun to use wikis as an online syllabus or as an integral part of the class. Technology teacher Paul Allison created the High School Online Collaborative Writing wiki, which was used for public schools in Manhattan, New York (Borja, 2006). Using this wiki, students wrote collaboratively, and in one example students wrote 20 different adaptations to the opening scene of MacBeth (Borja, 2006). To encourage K-12 teachers to implement and use wikis in their classroom, wiki host Wikispaces.com initiated the “100,000 Wikis in the Classroom” program in January 2006 (Wikispaces, 2008). The program sought to give away 100,000 free K-12 Plus wikis, a plan that includes all the features of the 50 dollars per year plan, to teachers who wanted to try a wiki in their classroom (Wikispaces, 2008). As of February 2008, approximately 57,903 free wikis had been given to educators by Wikispaces (Wikispaces, 2008).

Ongoing Research

Despite the criticisms of wikis, their uses are increasing with the implementation in business, industry, and education. While research on wikis is relatively sparse, some available cases do warrant attention. Beginning in 1997, the Georgia Institute of Technology (Georgia Tech) created its own version of a wiki, called Collaborative Websites (CoWeb), and integrated it across the various academic disciplines of Georgia Tech (Rick & Guzdial, 2006). The experiment netted mixed results: Architecture and English composition courses experienced success, while science, technology, engineering, and mathematics (STEM) courses met with significant resistance and hesitation (Rick & Guzdial, 2006). Successful courses succeeded

because they supported “collaborative learning, particularly in disciplines where open-ended discussion and reflection are valued” (Rick & Guzdial, 2006, p. 106). Students and faculty in science, technology, engineering, and mathematics (STEM) courses, however, resisted the CoWeb for reasons largely related to culture. Students viewed their field as being extremely competitive, and saw no reason to collaborate with others, since they believed they were competing against each other. In addition, they refused to believe that assignments had more than one answer, even when professors informed them that the problem had multiple answers (Rick & Guzdial, 2006). The STEM students who required assistance with assignments also refused to use the CoWeb to seek help, since doing so meant that they did not know the answer and also expected to elicit criticism from the faculty member and/or peers. Finally, teachers and professors of STEM courses generally did not believe that collaboration was necessary, did not encourage collaboration, and actively worked against the idea of collaboration by locking down components of the CoWeb so as to render it useless (Rick & Guzdial, 2006).

A comparative study conducted at Kent State University in 2007 examined two sets of college students consisting of juniors and seniors in a senior level broadcast communications course, with one group writing reports in the traditional face-to-face method and the other group collaborating using a wiki (Coyle, 2007). Results showed no appreciable difference between the two methods, though students tended to prefer the face-to-face method because it is the known commodity, the familiar method, and because at times face-to-face communication was simply more efficient (Coyle). However, Coyle further noted that the use of the wiki allowed students to collaborate with fellow group members at their own pace, while providing the opportunity to actually view each member’s work in progress.

As previously mentioned, at Boston College, Dr. Gerald C. Kane integrated a wiki using Socialtext (<http://www.socialtext.com>) into his course, MI 021: Computers in Management (Kane, 2007). Results proved generally positive and effective, within certain conditions and parameters. Using the wiki, students created much of the content for the course and the assignments as well, while also engaging in peer review of fellow student work. Students reported that the wiki was simultaneously the best and worst aspect of the course, though students who reported the wiki as their least favorite component still stated that collaboration was their favorite aspect (Kane, 2007).

Such findings led Kane to believe that a base level of participation was required from students if the wiki was to prove effective, and that top contributors should receive bonus points. Kane concluded that effective wikis should have the following components to prove successful: relatively small membership (150 members or less), a common or established format, a trusting and respectful open environment, a focus on subjects lacking controversy, a semi-formal work setting, and a dynamic environment.

An Example: Intended Use of the Wiki Use in Planning a Research Agenda

In this project example, researchers seek to use a wiki to assist higher education faculty across the United States in establishing a research agenda in preservice undergraduate science education and English as a Second Language education (with a focus on Spanish speakers). A collaborative forum will be launched as part of the *post-conference* activities for the Science Teacher Education for Hispanic English Language Learners in the Southeast (SHELLS) Conference and accompanying cyber-conference to be held April 18-19, 2008 at The University of Alabama. The research agenda for the participants focuses on the five following strands:

- *Status and Programs:* What is the status of preservice science teacher education programs addressing needs of Hispanic students in K-12 science classrooms? How widespread are preservice programs specifically addressing science for Hispanic students? In these programs, are graduates succeeding in adapting new behaviors and strategies for teaching science?
- *Academic and Sociocultural factors:* What are the academic needs that are specific to Hispanic students? What aspect of the sociocultural life of students needs to be built upon in the classroom?
- *Effectiveness:* How effective are new preservice science education models in addressing Hispanic students' needs?
- *Process:* What differences exist between preservice program models that address the teaching of science content to meet the needs of Hispanic students and program models that have not addressed such teaching?
- *Differences:* Are there differences in the knowledge and skill base required by science teachers if they are to successfully assist southeastern U.S. Hispanic student populations as compared to populations in the longer established communities found in Texas or California?

The SHELLS Conference Invitees (n=100) will be drawn nationally; with 12 keynote speakers invited. The speakers are researchers working in fields related to the problem: aspects such as teacher education, science education, English as a Second Language, applied linguistics, bilingual education, second language acquisition, second language learning, TESOL, assessment, and sociology of education. The interactive symposia will include brief background papers by researchers and from the field posing problems for consideration. Potential science teachers, administrators, and state department personnel will be invited from often underrepresented, high need, Hispanic student-impacted school systems and schools. In the second phase, SHELLS post-conference activities will focus on structuring a detailed action plan and gaining commitments from researchers to the plan's research agenda utilizing the wiki.

This study will provide an initial assessment of wiki use as a collaborative tool that can encourage and promote the collaboration desired from SHELLS. An evaluative survey will be administered to a sample of the participants. These data, along with archival data collected by the researchers will give an overview of how the wiki was perceived by the participants, specifically related to its value in collaboration to promote a research agenda.

Results or Expectations

Researchers hope to determine if wikis can assist faculty members-researchers in developing a research agenda to help achieve the following five goals: a) fostering an unique forum for the discussion of research applicable to the preservice education of teachers of science who will work with new, mostly Mexican and first generation, Hispanic students in the southeast; b) establishing a delineation of major priorities and critical research areas, methodological concerns, and implementation of research needed on K-12 preservice science teacher education in the southeast aimed at facilitating science instruction of new, mostly Mexican and first generation, Hispanic students; c) generating a research agenda and an action plan describing future development of the research agenda and identifying commitments of

researchers dissemination of the priorities, research agenda, and action plan regionally to every southeastern teacher education institution; d) assisting in the national dissemination of conference proceedings via multiple venues; and e) encouraging the continuation of dialog on post-conference website to support a network of interested participants, involving discussion/reports on commitments of researchers as a result of the conference. Ultimately, researchers expect that wikis will assist in generating a research agenda, though mixed results are possible.

This study hopes to determine the effectiveness and efficiency of using Web 2.0 tools, in this case a wiki, in fostering group collaboration, idea generation, and knowledge management. Web 2.0 tools have certainly gained attention inside and outside of academia, and determining the educational and pedagogical merits of these tools are crucial. We hope this research can add to, and build upon, the discourse in this arena.

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References

- AskDrWiki. (2007). AskDrWiki home page. Retrieved September 21, 2007, from http://askdrwiki.com/mediawiki/index.php?title=Physician_Medical_Wiki
- Borja, R. R. (2006). Educators experiment with student-written wikis. *Education Week*, 25(30), 10-10. Retrieved September 21, 2007, from <http://web.ebscohost.com.libdata.lib.ua.edu/ehost/detail?vid=1&hid=120&sid=2ea2e232-8345-4a9f-b8a0-50e3ae273549%40sessionmgr103>
- Coyle, J. E., Jr. (2007). Wikis in the college classroom: A comparative study of online and face-to-face group collaboration at a private liberal arts university (Doctoral dissertation, Kent State University, 2007). *ProQuest Dissertations & Theses*, AAT 3263183.
- Encyclopaedia Britannica, Inc. (2006). Fatally flawed: Refuting the recent study on encyclopedia accuracy by the journal *Nature*. *Encyclopedia Britannica, Inc.* Retrieved September 28, 2007, from http://corporate.britannica.com/britannica_nature_response.pdf
- Fichter, Darlene. (2005). Intranets, wikis, blikis, and collaborative working. [Electronic version]. *Online*, 29(5), 47-50.
- Giles, J. (2005). Internet encyclopedias go head to head. *Nature.com*. Retrieved September 21, 2007, from <http://www.nature.com/news/2005/051212/full/438900a.html>
- Goodnoe, E. (2005). Wikis make collaboration easier. [Electronic Version]. *Information Week*, 1053, 54, 56, and 58.
- Kane, G.C. (2007). Case study: Socialtext at Boston College. From information in *Wikis and Emerging Web 2.0: eLearning Communities*, presented as a webinar on September 6, 2007.
- Nature.com. (2006). *Nature's* responses to Encyclopaedia Britannica. *Nature.com*. Retrieved September 28, 2007, from <http://www.nature.com/nature/britannica/index.html>
- Oatman, E. (2005). Make way for wikis. *School Library Journal*. 51(11), 52-54. Retrieved from ERIC Online Database (ERIC Document Number 03628930) through the September 20, 2007, from

- <http://web.ebscohost.com/ehost/detail?vid=1&hid=108&sid=9f3a8b28-632e-4a5e-b7b4-121ad0764dc3%40sessionmgr103>
- Rheingold, H. (2007). Case study: Socialtext at Stanford University and University of California, Berkeley. From information in *Wikis and Emerging Web 2.0: eLearning Communities*, presented as a webinar on September 6, 2007.
- Rick, J. & Guzdial, M. (2006). Situating CoWeb: A scholarship of application. *International Journal of Computer-Supported Collaborative Learning*, 1(1), 89-115. Retrieved September 7, 2007, from http://vnweb.hwwilsonweb.com.libdata.lib.ua.edu/hww/results/external_link_maincontentframe.jhtml?DARGS=/hww/results/results_common.jhtml.9
- Sanger, L. (2004). Why Wikipedia must jettison its anti-elitism. On *kuro5hin.org*. Retrieved September 20, 2007, from <http://www.kuro5hin.org/story/2004/12/30/142458/25>
- Scott, D. M. (2006). Chewing gum, blogs, and wikis. [Electronic version] *EContent*, 29(2), 48.
- Science Environment for Ecological Knowledge (SEEK). (2007). SEEK home page. Retrieved September 21, 2007, from <http://seek.ecoinformatics.org/>
- SmallBusiness.com. (2007). SmallBusiness.com home page. Retrieved February 13, 2007, from http://www.smallbusiness.com/wiki/Main_Page
- Wagner, Christian. (2004). Wiki: A technology for conversational knowledge management and group collaboration. Article located in *Communications of the Association for Information Systems*, 13, 265-289.
- Warlick, D. (2007). The executive wiki. *Technology & Learning*, 27(11), 36, 38. Retrieved September 13, 2007, from http://vnweb.hwwilsonweb.com/hww/results/results_fulltext_maincontentframe.jhtml;hwwilsonid=SLHI2WAT5IICJQA3DIMCFF4ADUNGKIV0
- Waters, J. K. (2007). Online collaboration: Curriculum unbound!. *T.H.E. Journal*, 34(3), 40-48. Retrieved September 13, 2007, from <http://web.ebscohost.com/ehost/detail?vid=1&hid=9&sid=0eb6c008-8e69-4b83-8fbd-c162028342b4%40sessionmgr9>
- Webopedia.com (2007). Webopedia online dictionary. Retrieved from <http://www.webopedia.com/TERM/t/troll.html>
- Wikipedia.com (2008a). History of wikipedia. *Wikipedia*. Retrieved September 20, 2007, from http://en.wikipedia.org/wiki/History_of_Wikipedia.
- Wikipedia.com (2008b). Statistics. *Wikipedia*. Retrieved January 29, 2008, from <http://en.wikipedia.org/wiki/Special:Statistics>
- Wikipedia Watch. (2007). Wikipedia Watch home page. *Wikipedia Watch*. Retrieved September 20, 2007, from <http://www.wikipedia-watch.org/>.
- WikiProteins. (2007). WikiProteins home page. Retrieved September 21, 2007, from <http://www.wikiprofessional.info/>
- Wikispaces. (2008). 100,000 Wikis in the classroom. Wikispaces.com. Retrieved February, 1 2008, from <http://www.wikispaces.com/site/for/teachers100K>