Collaborative Learning the Wiki Way

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INTRODUCTION

Assigning readings for students to complete before coming to class is easy; however, getting students to read the material before coming to class is not likely to happen. Undergraduate and graduate students alike come to class not having read assigned materials with the expectation that the professor will tell them what content will be on the test (Burchfield & Sappington, 2000; Clump, Bauer, & Bradley, 2004; Clump & Doll, 2007; Marchant, 2002; Ryan, 2006). Students who know that they will be quizzed on the material when they come to class or who know there might be a surprise quiz are more likely to read assigned materials; however, quizzes do not ensure that students will complete assigned readings (Burchfield & Sappington; Marchant). Bunge (2008) and Kaiser (1994) found that meaningful challenging assignments do motivate students to read assigned materials and to complete class assignments. Web 2.0 tools, such as wikis and blogs, provide students with meaningful assignments (Grant, 2006; Farabaugh, 2007; Parker & Chao, 2007). Web 2.0 applications are free with the software used online rather than downloaded to individual computers. Ease of access, ease of use and a general familiarity with online tools and their recognized role in the lives of present and future student populations have led us to seek ways to explore their use in the classroom.

Web 2.0 has the potential to provide students with learning experiences that are "… personally meaningful, collaborative, and socially relevant" (Greenhow, Robelia, & Hughes, 2009, p. 249). Wikis consist of dynamic web pages that are constantly under construction as readers respond by adding to and changing what they have read. Wikis allow students to participate in collaborative learning environments where they can quickly and easily build course resources (Parker & Chao, 2007). Further, they contend that as students read, reflect, and write their own course materials they learn the course content better than if they just read their textbooks. When a class wiki was introduced into a language arts methods class students reported not only reading assigned materials, they consulted textbooks they had used in other classes, and read beyond the course textbooks to find material to post on the wiki (Matthew & Felvegi, in press; Matthew, Felvegi, & Callaway, in press). In an effort to expand the scope of our research on using a wiki in the classroom, the decision was made to look at aspects that contributed to student engagement and involvement with the course material. This article explores the motivational factors that contributed to students reading assigned materials and seeking additional resources to learn more about the course content.

Traditional Approaches to Assigned Readings

Students who read assigned materials before coming to class participate more and learn more. Instructors however know that many students arrive in class not having read the materials. Not only will some students not have read the assigned material; they will expect the professor to tell them what is in the material, and to not ask them questions about the material itself during class discussions (Burchfield & Sappington, 2000; Clump & Doll, 2007; Ryan, 2006). Clump, Bauer, and Bradley (2004) found that only 24.76% of undergraduate psychology students read assigned materials before class and 69.98% read the materials before a test. Graduate psychology students are somewhat more

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likely to read before class 54.21% and 84.14% read before a test (Clump & Doll). Burchfield and Sappington (2000); Clump, Bauer, and Bradley; Clump and Doll; and Marchant (2002) advocate quizzes, worksheets, tests, or awarding extra points to motivate students to complete assigned readings.

Getting students to read assigned materials is not the only challenge; professors also face the challenge of getting students to become fully engaged in their learning and to complete assignments in order to enhance their learning. Providing students with authentic assignments and assignments relevant to their career goals can motivate students to become engaged in their learning and complete the work (Kaiser, 1994; McCarthy & McCarthy, 2005). Additionally, McCarthy and McCarthy discovered that when students are enthusiastic about a project their levels of engagement increase as the work progresses. Clump, Bauer, and Bradley (2004) suggest having students develop their own textbook, which may be just the authentic project students need to get them to read the material and complete assignments. Kaiser reports that a purposeful writing assignment for a real audience other than the professor motivated her students to take pride in their work.

I think we need bits about

The Implications of Motivation and Self Efficacy for Instruction

Motivation is a key component of learning success. While a great many motivational theories exist, the connotation of the word remains fluid; its elements vary depending on the discipline attempting to define it. While evidence of extrinsic motivation is easily found, intrinsic motivation can only be inferred. The effects of extrinsic factors such as instructor guidelines, group size or grades are more readily assessable, as opposed to the role of intrinsic where factors can be as wide-ranging and diverse as the student population.

Successful adult learning depends on a number of variables occurring as the learning process progresses. For learning to be meaningful, Wlodkowski (2008) prescribes the integration of success, volition, value and enjoyment. The effects of some motivational factors with regards to technology integration and wikis in particular have been confirmed by Rodgers and Withrow-Thorton (2005); Raman, Ryan, Olfman (2005); Matthew and Felvegi (in press); and Matthew, Felvegi, and Callaway (in press). For meaningful learning to occur students need opportunities to actively engage in knowledge construction (Mayer, 2002). Constructivism holds that knowledge is created by participation in authentic activities that require students to build upon their prior experiences as they interact with their environment to create new understandings (Brand & Wilkins, 2007; Jonassen, Carr, & Yueh, 1998). Students move beyond just accumulating knowledge; they think critically, reflect, and use the knowledge (Tynjal, 1998). Teachers are facilitators who guide students as they construct their own knowledge by engaging in authentic assignments that result in meaningful learning. The teachers' guidance ensures that students successfully complete the assignments.

Successful experiences help students develop a strong sense of self-efficacy (Bandura, 1994). Self-efficacy is a belief in one's ability to complete a task or to achieve a goal (Bandura, 1997). Providing students with successful experiences using technology to create knowledge changes them from being "recipients of information" to "agents of learning" (Bandura, 2002). Further he contends that knowledge construction increasingly depends on developing Internet literacy, which requires learners to not only be able to conduct effective searches for information, but to also be able to process and to critically evaluate the information they find. Those who lack the efficacy to do so become overwhelmed, hence, perceived self-efficacy impacts learners' acceptance and use of technology (Bandura). Preservice teachers with high self-efficacy regarding technology are more likely to include technology in their own classrooms, hence, it is important to provide them with successful experiences using technology to enhance their learning (Watson, 2006).

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Purpose of the Study

Participation in classroom activities and internalizing the course content are important elements of the learning process, not to mention assessing student progress. Emerging technologies and the resulting online practices provide academia with the opportunity to integrate everyday applications in (or as) learning environments with which the student body is familiar. Technology integration, showing how everyday tools can be used for non-leisure activities also serves the purpose of preparing pre-service teachers to face generations growing up online. In order to facilitate active knowledge construction as well as encourage students to work collectively, collaboratively in an online environment, pre-service teachers were required to contribute to a class wiki. Their task was to create content based on the course materials with the implied goal of going beyond the content provided to them and to make connections between other courses, new materials and personal experiences. The purpose of this study was to expand the scope and nature of the data analysis from the Spring 2008 and Fall 2008 semesters to include data from the Spring 2009 semester. Data sets old and new were analyzed in order to reveal the relative significance of key components related to engagement with the course content to such factors as motivation and self-efficacy.

METHODOLOGY

Four sections of an undergraduate language arts methods course taught by the first author and offered at a southwestern university in Spring 2008, Fall 2008, and Spring 2009 were the focus of this research study. Case study design was selected to facilitate the interpretation of participants' experiences (Stake, 1995). Content generated by the participants, as well as their written reflections, email correspondence, and interviews provided insight into their interpretations of their experiences contributing to the class wiki.

Participants

Pre-service teachers enrolled in four sections of a language arts methods class over the course of three semesters were the participants in this research study; two sections of students participated during the Spring 2008 semester. As shown in Table 1 there were 54 students including 52 undergraduates and 2 graduate students. This field-based class met at an elementary school in southeast Houston. Students self-identified their age, gender, and ethnicity and reported ages ranging from 20 to 51 years including 5 males and 49 females. Ethnic backgrounds included 29 Caucasians, 22 Hispanics or Latinos, 1 Asian, 1 Asian/American, and 1 African American. Of the 69 students enrolled in the classes, 15 students opted not to participate in the study.

Table 1. Participants

	Spring 2008	Fall 2008	Spring 2009	Totals
Undergraduates	30	7	17	54
Graduates	2	0	0	2
Males	1	2	2	5
Females	29	5	15	49
Caucasians	17	3	9	29
Hispanics or Latinos	12	2	8	22
Asian or Asian/American	1	1	0	2
African American	0	1	0	1

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Procedure and Data Collection

PBworks (then Pbwiki) software was chosen for use in the classroom. Since its offset, PBworks has grown into a free educational solution now "used by over 250000 educators worldwide" (PBworks.com, 2009). The instructor created a basic interface; the pages reflected the Texas English Language Arts and Reading Educator Standards (State Board for Educator Certification, 2000), which align with the National Council of Teachers of English/International Reading Association Standards for the English Language Arts (NCTE/IRA, 1996), which serve as a framework for the course content. Preservice teachers' knowledge of the standards is tested in the Texas Examinations of Educator Standards (TExES) prior to their receiving teacher certification.

Prior to the start of the Spring 2008 semester a class wiki was created that consisted of 14 pages including an introductory front page, a table of contents page, 11 pages covering course content, and a dictionary page. During Fall 2008, a student converted the dictionary from one page to 27 pages as she created a main page and one page for each letter of the alphabet. The course content pages include the following: 1) oral language, 2) phonological and phonemic awareness, 3) alphabetic principal, 4) literacy development and practice, 5) word analysis and decoding, 6) reading fluency, 7) reading comprehension, 8) development of written communication, 9) writing conventions, 10) assessment and instruction of developing literacy, and 11) viewing and representing.

At the beginning of each semester the students were introduced to the wiki with a handout complete with screen shots and step-by-step instructions for editing the pages. The Internet filter at the elementary school where the class was field-based blocked access to the wiki, which prevented in class demonstrations of how to contribute to the pages. Students were encouraged to contact the professor about access or editing issues related to the wiki. When problems arose with the wiki students discussed them in class, called the professor, emailed the professor, posted in WebCT asking for help from their classmates, or went to the professor's office.

As required in the course syllabus, students added one word to the dictionary and added information to each of the 11 content pages. In groups of two or three students selected a wiki page that they would monitor and organize throughout the semester. Students were instructed to add to the wiki pages after reading and discussing the material in the course textbooks and after completing in-class activities. During the three hour and fifty minute class thirty-minutes each class period was spent tutoring students in the elementary school where the class met. Students were asked to make connections between the material in the textbooks and their tutoring sessions as this would give them ideas for information to contribute to the wiki. To ensure that students contributed to the wiki throughout the semester they were required to post three times in their WebCT folders giving a brief description of their contributions to the wiki and a reflection on the collaborative writing process. At the end of the semester they were responsible for making finally editing and formatting changes to their group page and to reflect once again on their experiences contributing to the wiki. The final exam for the class also included a question asking them to reflect on their participation in the wiki.

Data collection included online observations of the development of the wiki pages, students' reflections periodically posted in WebCT, final reflections on the final exam, email correspondence, interview transcripts, and researcher notes. At the end of the first semester five students were randomly selected to participate in interviews about their experiences contributing to the wiki pages. The interview questions were designed to elicit additional comments from the students regarding their participation in the wiki and to confirm information found in the reflections. The second author, a graduate research assistant, conducted the interviews. Data was imported into NVivo 8 software for analysis.

Data Analysis

Data from the Spring 2008, Fall 2008, and Spring 2009 semesters were analyzed to determine

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the relative significance of key components related to engagement with the course content to such factors as motivation and self-efficacy. Trend data analysis focused on categories emerging through multiple phases of coding. Final categories were established based on relevant patterns of data as well as across sections of literature analysis.

Success was primarily assessed as success or failure to add content. The presence of content not only denotes a fulfillment of extrinsic motivational factors (grade requirement), but also builds confidence with technology use. The measure of the role of volition in the process of building a wiki was measured on two subscales as reported by the students. One scale shows the choices made by students based on content already present on the wiki and how that factored in their choice of content posted, the other reflects the overall ease with which they approached the task as well as the clarity of the editing process. While the number of edits overall reflects the general success of the process, the choices made when adding content reflects a shift in the creation of the wiki.

The decision was made to have students add to the wikis used in prior semesters, hence supposing latter classes would have a harder time adding content. The data reflects that it was not as much the type, but rather the volume of the content present that made the editing process more difficult. Issues raised by the increasing page lengths and formatting issues emerge in greater numbers in latter classes, while the number of content addition difficulties remain relatively the same. This suggests that students in the latter semesters accepted the fact that they had to make changes to a wiki created by prior students.

Numbers pertaining to the value of using a classroom wiki show that all three classes held similar views of the role of content generation with regards to understanding the course content, as well as its use in other classes and their own practice. The self-reported presence of enjoyment, pride and ownership numbers, also show that all three classes enjoyed working with the wiki to equal measure. All three classes had contributors not happy with the tediousness of the task, but the majority reported that they enjoyed working on the pages and felt proud that they were able to share it with others.

The technology related comments of the student reflections align to expected values, the first class session (32 students) reported 21 issues, with most issues pertaining to login (wrong password, forgotten wiki URL) and editing matters (content or formatting vanishing). The second class (7 students) reported 42 issues, with the majority of login and content deletion issues resulting in the release of the new version of PBwiki mid-semester. The number of technology related issues typical in the first two classes were not representative in the third, rather they tied in with the difficulties with regards to finding and adding content in a meaningful way. Issues ranged from knowing how to structure and format the large volume of information present so that it would make accessing all the information present easier.

RESULTS

Results of the data analysis across the three semesters were examined to find evidence that completing the assigned readings and contributing to the class wiki resulted in meaningful learning for the students and impacted their self-efficacy.

Success

Whereas students consult Wikipedia when they need information, few contribute content or are even aware they can contribute. Hence, contributing to the wiki was a new experience. While not all students had successful encounters while contributing to the wiki, students reported that as they continued to contribute to the wiki they grew more comfortable and knowledgeable. “At first, I was confused when it came to a wiki page. I had never done anything like it before. It was something different and difficult for me. Now, the wiki pages are growing on me. I can edit and navigate my way through them like a pro.” It can be inferred that successful experiences helped students develop a

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strong sense of self-efficacy regarding the use of the wiki.

In Fall 2008, PBwiki upgraded their web site and sent notices inviting users to upgrade their wikis to the new version. The decision was made not to upgrade until the end of the semester. However, during the last week of the semester as students were finishing their final edits to their pages a student deleted an entire page of the wiki. In order to restore the page, the site had to be upgraded to the new version. The upgrade required students to create another account in order to finish their work. A posting was made in the instructor message section of WebCT explaining the reason for the upgrade, requesting that they reply to the post if they encountered problems, and to just do the best they could without stressing over any problems. Four students reported problems with one reporting back that the issue had been resolved.

Volition

Contributing to each standard on the wiki required searching beyond the course textbooks to find information that was not already on the wiki, "I also think the wiki made us, the students, responsible for locating additional information and concrete support for each particular standard since we couldn't put in what was already there. By having us post to each standard, I spent time reading about each standard." While several students noted the benefit of posting to each standard, others complained about how much work it took to find material to add to each standard and suggested that they should each be required to contribute to only one standard. These students were focusing on completing the course requirements and they did not recognize the wiki as a valuable assignment relevant to their career goals. In future classes it will be important to help all of the students see the wiki as relevant to their career goals and to them personally.

Searching for content to add to each standard was time consuming and could be a source of frustration, "When it came to trying to find something to add that hadn't already been posted, however, it could be quite frustrating." From the frustration came a valuable lesson ". . . I learned how to sort through mountains of information that are out there to glean just what I needed. I learned how to narrow in on the really important skills that will help me in teaching. Rather than just accepting what I read at face value, I learned to look for true gems that will enhance my teaching." This student looked critically at the information that she found before contributing it to the wiki. She saw the wiki as a valuable resource and was determined to only contribute the best she could find.

Value

Students discovered that contributing to the wiki pages necessitated reading and rereading their textbooks, related Internet sites, and the wiki pages, and as one commented "… I was reading more than I wanted to and retaining more." After finding material in her textbook to contribute to the wiki one student commented that she kept "on reading because it was something interesting to me or something I did not know before." Another student who throughout the semester edited and organized her group's page on a weekly basis noted that, "Reading the page time and time again helped me to commit a large portion of it to memory." Consistently throughout this study students have noted that contributing to the wiki, as two students put it, "forced" them to read and reread the material, which they realized resulted in learning and remembering. A student reflected that searching beyond the textbooks for information to contribute "gives me better understanding of the material and embeds it into my memory." Even though repeated interactions with the course content resulted in learning and reinforced their learning, students unaccustomed to having to read their textbooks complained because contributing to the wiki required them to not only complete the assigned readings, but to read additional material as well.

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Enjoyment

Students recognized that this assignment was different from other assignments. This one had a real purpose and an authentic audience, which resulted in students enjoying the assignment and assuming ownership of the wiki. "I like the fact that my work and input will still be viewed and utilized in future classes rather than just being placed in a file never to be seen again or thrown away at the end of the semester." This was not an assignment that would just be viewed by the professor; this assignment was going to be used by students presently enrolled in the class and by future students. Students' reflections indicated that they enjoyed contributing to the wiki in part because it gave them an opportunity to be creative, "This time I really enjoyed writing to the wiki pages. They gave me a chance to be creative and add some things that I feel are important." Not only did the wiki allow students to be creative, they recognized that it was a tool for communicating with others, "I enjoyed this activity and I think it will be a valuable communication tool for [a] future project." The freedom to be creative, the opportunity to collaborate and communicate with their classmates, and the chance to contribute to an ongoing assignment was an enjoyable experience that resulted in students' taking ownership of the wiki.

CONCLUSION

Motivation is a dynamic continuous process that changes over time and while teachers can influence motivation they cannot directly motivate students (Wlodkowski, 1978). While personally meaningful assignments that are relevant to their career goals and that they perceive as beneficial, such as the wiki, can intrinsically motivate students to contribute, this motivation will not be consistent over the course of the semester. Quizzes, tests, worksheets, and grades provide extrinsic motivation that helps ensure the motivation continues throughout the semester (Burchfield & Sappington, 2000; Clump, Bauer, & Bradley, 2004; Clump and Doll, 2007; Marchant, 2002). The wiki assignment was both intrinsically and extrinsically motivating. Most importantly students reported that they valued the assignment and that it helped them learn the course content.

Sifting through the vast amount of information on the Internet, or "mountains of information" as one student reflected, requires students to not only conduct effective searches, but to also critically evaluate the information they find. Students with the needed Internet literacy skills have the self-efficacy to successfully contribute to the wiki and to become "agents of learning" who use technology to create knowledge (Bandura, 2002). It seems that for some students contributing to the wiki helped them acquire Internet literacy skills or enhanced the skills they already had. Overcoming the technology challenges encountered when contributing to the wiki and gaining confidence in using technology was noted in the students' reflections. Preservice teachers who successfully use technology in their university classes are likely to develop the self-efficacy they need to integrate technology in their own classrooms.

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