The Use of Wikis and Weblogs
to Support Deep Approaches to Learning

Norm Vaughan
Coordinator of the Inquiry through Blended Learning Program
Teaching and Learning Centre
University of Calgary
Calgary, Alberta
Canada

Abstract

The use of wikis and weblogs in formal educational contexts is increasing (Higdon, 2005) and the focus of this study was to document their impact on student approaches to learning. Students in an undergraduate education course used wikis to collaboratively summarize online discussion forum sessions and weblogs for self-reflection and peer review of course assignments. Survey and focus group results indicate students perceive that these digital tools can support deep approaches to learning only when the teaching approaches and the assessment framework for a course are intentionally designed to promote peer collaboration and reflection.

Overview

Educators are often heard to complain that students within course-based environments are not taking a deep approach to their learning (Rhem, 1995). What are approaches to learning? And, could social networking tools, such as wikis and weblogs, be used to help support a deeper approach?

Ramsden (2003) suggests that approaches to learning are ways in which students choose to strategize their learning, based on the motivation they have regarding particular outcomes, in a particular setting. A deeper approach involves internal motivation, an intention to understand the material completely by examining new facts and ideas critically, and tying them into existing cognitive structures. Students focus on what the course material means and how it how it may be applied through linking to past knowledge and everyday experience.

Students adopt a surface approach when their intention is only to complete the task requirements for a course in order to receive a certain mark or passing grade (i.e., external motivation). They accept new facts and ideas uncritically and attempt to store them as isolated, unconnected items. Rote memorization is the common strategy used with this approach. Students focus on the 'signs' or external pieces of information with minimum emphasis on synthesis or integration.

There are a number of factors that influence a student's approach to learning (Trigwell, Prosser, & Waterhouse, 1999). Marton and Saljo (1976) indicate that the types of questions that a teacher uses within an educational setting can influence student learning. For example, "what" and "where" questions elicit surface approaches while "why" and "how" questions encourage deep approaches. These different approaches to learning are further reinforced by the type and selection of questions that are used on exams (Svensson, 1977). Entwistle (2000) states that the nature of assessment activities within a course directly affects student approaches to learning. For example, standardized tests can lead to memorization and a surface approach while collaborative group projects can encourage dialogue and a deeper approach. In addition, Biggs (1987, 1988) stresses that context and workload impact the approach to learning. He suggests that a course, which focuses on extensive content coverage and recall of facts forces students to take a shallower, surface approach to learning.

Two social networking tools that could potentially be used to support a deep approach to learning within a course are wikis and weblogs. Leuf and Cunningham (2001) define a wiki as a collection of web pages that can be edited by anyone, at any time, from anywhere. In addition, Lamb (2004) describes a wiki as a collaborative web-based writing tool. Wikis have recently emerged as a very powerful digital tool for supporting student collaboration. Wikis allow faculty and students to engage in collaborative activities that extend well beyond the classroom walls. Probably the best example of a global collaborative project supported by a wiki is Wikipedia. This is a web-based, multilingual encyclopedia, which has been co-created by thousands of contributors from all over the world (http://www.wikipedia.org/).

Weblogs are often referred to as a web-based public diary with dated entries, usually by a single author, often accompanied by links to other weblogs that the author of the site visits on a regular basis (Downes, 2004). Easy to create and use, blogs — a shorthand term for weblogs — are a forum for Internet publishing that have become an established communication tool. In higher education, weblogs have been used by students for reflection about assignments, course work, careers and current events (Ferdig & Tramwell, 2004). They can also be used to capture and disseminate student and faculty generated content through the use of RSS (Really Simple Syndication), a web content sharing feature.

The objective of this research study was to investigate whether social networking tools, such as wikis and weblogs, could be used to support deep approaches to learning within an undergraduate education context.

Study Context

This study examined student use of wikis and weblogs in an undergraduate education course entitled *Introduction to Computers in Education* during the fall 2005 and winter 2006 semesters. The course took place over a 15-week period and consisted of a weekly 3-hour lecture and 2-hour tutorial. Of the 46 students involved in this study, 89 percent

were female, 87 % were under the age of 26, 100% had home Internet access and 50% had previous experience using information and communication technology in a higher education course (e.g., web site, e-mail, online discussion forums).

Erhmann's triad model (1998) was used to align the learning outcomes, activities and use of technology within this course (Figure 1). The principal learning outcomes were the development of student knowledge, skills and attitudes with regards to using a computer to support information literacy, communication and group effectiveness. The course activities were designed to promote collaboration and reflection through the use of wiki and weblog tools.

Figure 1: Triad Model
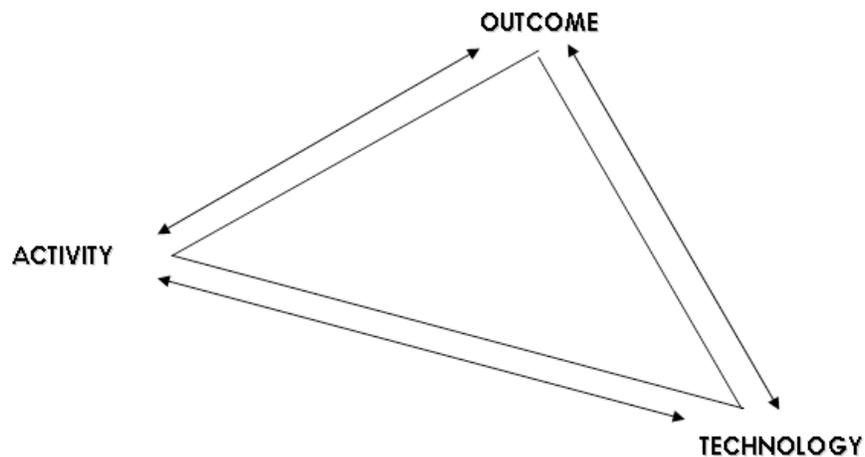
(Modified from Erhmann, 1998)

Wikis were used by student groups to collaboratively summarize weekly online discussion forum sessions that students had self-selected to moderate. The activity was designed as follows:

1. A series of online discussion forums were created within a learning management system, such as Blackboard, which related to the key modules/topics for the course.
2. Groups of students (2–3) choose a module based on course readings, previous experience and/or interest in the topic.
3. Each student group was responsible for moderating and summarizing their selected online discussion for a week long period.
4. The groups then used a wiki to make draft notes and a final summary of the online discussion based on guidelines co-created by the students and the course instructor.

The student participants used weblogs for self-reflection and peer review of course assignments. The following procedure was utilized:

1. Each student created their own weblog.

2. After the completion of each course assignment and review of the instructor's assessment feedback, the students posted responses to the following reflective questions on their weblogs:
    a. What did you learn in the process of completing this assignment?
    b. How will you apply what you learned from this assignment to the next class assignment, other courses and/or your career?

3. In terms of peer review, students attached drafts of specific course assignments to their blogs. Then other students in the class were randomly selected to review these documents and post responses to the author's weblog. Guiding questions for the peer review process included:
    a. What did you learn from reviewing this document?
    b. What were the strengths (e.g., content, writing style, format and structure) of the document?
    c. What constructive advice and/or recommendations could you provide for improving the quality of this document?

Methods of Investigation

A naturalistic inquiry approach was used to guide the research process for this study (Lincoln & Guba, 1985). This approach implied that meaning was socially constructed by individuals through interaction with their worlds (Creswell, 2003). Multiple methods of data collection and analysis were employed in order to understand if and how wikis and weblogs could be used to support deep approaches to learning.

A web-based pre-study survey was administered at the beginning of the first lecture to gauge students' initial perceptions about their approaches to learning (Appendix 1). The items within the survey were adapted from Ramsdan's (2003) orientation to studying questionnaire. An identical post-study survey was deployed during the 12th week of the semester in order to determine how students' perceptions about their approaches to learning had changed as a result of their course experience using wikis and weblogs. In addition, all students participated in an hour-long focus group, conducted during the 13th week of the semester, to further explore how the students' approaches to learning had been influenced by the course objectives, activities and use of wikis and weblogs.

Findings

On the pre- and post-study surveys, students were asked to respond to 12 randomly ordered statements about their studying and learning preferences using a 5 point Likert-scale rating (1 = strongly disagree to 5 = strongly agree). The mean response rating was calculated for each of the pre- and post-study statements and then a series of t-tests were performed to determine whether or not the differences in mean scores were statistically significant ($p < 0.05$). The results from these survey calculations are reported in Table 1.

Table 1: Survey Results — Student Approaches to Learning

Statement	Pre study mean	Post study mean	Diff.	*p* value
Surface Approach - Reproducing Orientation				
1. I find I have to concentrate on memorizing a good deal of what we have to learn.	3.72	3.16	-0.56	0.0006**
2. I usually don't have time to think about the implications of what I have read.	2.73	2.72	-0.01	0.6600
3. Although I generally remember facts and details, I find it difficult to fit them together into an overall picture.	2.84	2.58	-0.26	0.0440*
4. I find I tend to remember things best if I concentrate on the order in which the teacher presented them.	3.78	3.61	-0.17	0.3828
5. I tend to choose subjects with a lot of factual content rather than theoretical kinds of subjects.	3.26	3.20	-0.06	0.5527
6. I find it best to accept the statements and ideas of my lectures and question them only under special circumstances.	2.98	2.95	-0.03	0.7766
Deep Approach - Meaning Orientation				
7. I try to relate ideas in one subject to those in others, whenever possible.	4.00	4.02	+0.02	0.6600
8. I usually set out to understand thoroughly the meaning of what I am asked to read.	3.98	3.68	-0.30	0.0357*
9. In trying to understand new ideas, I often try to relate or apply them to real life situations.	4.26	4.07	-0.19	0.0484*
10. When I'm tackling a new topic, I often ask myself questions about it which the new information should answer.	3.09	3.34	+0.25	0.1424
11. In reading new material I often find that I'm continually reminded of material I already know and see the latter in a new light.	3.70	3.70	0	1.0000
12. I spend a lot of my free time finding out more about interesting topics which have been discussed in classes.	3.11	2.77	-0.34	0.0415*

*$p < 0.05$
**$p < 0.01$

The means for all the statements associated with a surface approach decreased between the pre- and post-study survey suggesting that the students were moving away from this approach to learning. The difference in means for statement 1 and 3 was significant indicating that students were decreasing their reliance on memorizing facts and details

and instead were attempting to connect them together in order to create a "bigger picture" as an approach to learning in this course.

The statistical results for the statements related to deep approaches to learning were mixed. While the means associated with these statements were generally higher than those connected with surface approaches there was an overall decline from the pre to post survey and the three statements that had significant *p*-values (statements 8, 9 and 12) imply that as the semester progressed students were spending less time outside of class reading and discussing course related concepts.

Within the focus group, students debated the advantages and challenges of using wikis and weblogs to support their learning. The themes and related student comments that emerged from this discussion related to wikis are summarized in Table 2.

Table 2: Focus Group Results — Advantages and Challenges of Using Wikis

Advantages		
Theme	**Example of student comments**	**Number of related comments**
1. Facilitated "virtual" group work — increased communication, access and flexibility	*I liked that we were able to work on this from home and that my partner was able to access and correct my work and i was able to do the same.*	17
2. Good organizational tool for synthesizing ideas and group reflection	*It helped to bring all of the information we gathered and the responses given all together. It was also good to get us to read through every comment and evaluate what people thought.*	10
3. Public nature of the summary — easy for everyone to view and make responses	*The availability of it for everyone else to see, not just like typing up and handing in notes, which would be kinda boring.*	9
4. Motivational	*Its interesting and i like using this*	4
5. Ease and convenience of use	*It is a very convenient tool. It is almost perfect. After we post the summary, we can still edit it. I think it is a great way for sharing ideas.*	4
6. Ensured that all group members were involved in contributing to the summary	*We were able to create a summary that involved everybody's ideas and input.*	2
7. Created a "space" to allow for a diversity	*In creating the wiki we had to read over everybody's discussion posting and it gave us a*	1

of opinions and perspectives to be heard and appreciated	*broader sense of where everybody stood on the questions we asked.*	
8. No advantages	*I really can not think of any advantages*	1

Challenges		
1. No disadvantages	*This was my first time using a wiki and I really couldn't find any disadvantages for it*	17
2. Group communication and motivation issues	*It was a little stressful when you have completed all your work and you keep looking and your partner still has not put up there information.*	7
3. Technical issues	*I had troubles at first trying to use wiki...i posted some work and i didn't save it properly.*	5
4. Would have been easier to use MS Word	*Contributing to the wiki was just like writing everything out in a normal word document. There was nothing particularly interesting that made it stand out.*	3
5. Learning curve involved in using a wiki	*At times it was kind of hard and difficult to use. Maybe because I haven't used it before.*	2
6. Workload involved in using a wiki to create a summary	*Having to read and summarize all the comments and postings.*	2
7. Restrictive	*It's a limited way to of doing the review, could be done in other forms*	1

The three key themes that students identified as benefits of using a wiki were the ability to facilitate virtual group work (i.e., leading to increased communication, access and flexibility), the public nature of the summary (i.e., easy for everyone to view and make responses), and the ability of the tool to create a positive learning experience. Generally, students indicated that there were no major challenges of using a wiki to support their learning but they expressed several concerns; group communication and motivation issues (i.e., stress associated with waiting for your partner to complete their work), technical issues (i.e., problems saving text), and the initial learning curve involved (i.e., editing text).

Students were asked an identical pair of questions regarding the value of weblogs within the course and the results are highlighted in Table 3.

Table 3: Focus Group Results — Advantages and Challenges of Using Weblogs

Advantages		
Theme	**Example of student comments**	**Number of related comments**
1. Provides opportunities for reflection	*The weblog allowed me to record my thoughts and goals. If I hadn't done that right after each assignment, then I would have lost what I thought about my work, and what I could have done better.*	15
2. Ability to receive feedback from peers and the teacher	*It was pretty cool, you get someone's opinions and thoughts about the work you've done, could help u improve and strengthen things*	15
3. Easy and accessible to use	*I loved it. I think its a really easy thing to use and I wish I knew more about it before this class*	7
4. Public nature of personal comments	*It was easy access for other students to view reflections of our experiences. It was also very simple to register, and get the hang of it. You also feel like your on a more personal basis with the other students in the class, because you get a chance to see into their minds!*	4
5. Digital record and archive of personal reflections	*I can refer to my weblog as often as I need to and the information will always be there. (Don't have to worry about losing paper copies.)*	2
6. Provides opportunity for writing practice and self-improvement	*It made me think about how to improve on myself and allowed me to use my writing skills to express myself in an organized, thoughtful manner.*	1
Challenges		
1. No disadvantages	*I didn't really find anything wrong or a disadvantage of using the weblog. I really liked it, and felt that it was a useful tool.*	14
2. Public nature of comments	*They were public so it was hard to make complaints and constructive criticisms*	7
3. Time involved in keeping the Weblog updated	*You have to find the time to update the weblog to avoid it becoming outdated.*	4
4. Potential to post and receive negative comments	*A disadvantage could be that if something negative or personal was said everyone was able to see....however that wasn't the case so....*	2
5. Orientation issues	*I found it a bit confusing when I first started using the weblog. But once I started it was way easier.*	2
6. Computer dependant activity	*Constantly need access to a computer to access assignments, comments, etc.*	2

7. Impersonal and boring	*It is fairly boring, have to use a set style.*	2
8. Technical issues	*doesn't let us get our own background and so have to stick with limited choices*	2

The student responses were all very positive and they emphasized how easy it was to use blogs to support peer review and reflection within the course. Similar to wikis, there were very few disadvantages identified regarding the use of weblogs, although there were several concerns articulated about the public nature of the postings and the resulting potential for negative feedback.

Discussion

A number of educational researchers have written about how approaches to teaching can influence students to adopt a deep versus surface approach to their learning within a particular course setting (Biggs, 1988, 1987; Entwistle, 2000; Laurillard, 1993; Ramsdan, 2003; Trigwell, Prosser, & Waterhouse, 1999). Surface learning approaches are promoted by teaching and assessment methods that emphasize recall or the application of trivial procedural knowledge while deep approaches are encouraged by teaching and assessment strategies that foster active and long-term engagement with learning tasks (Ramsden, 2003). In addition, Moon (2004) stresses that providing ongoing opportunities for students to reflect upon their own learning process can help develop a deep approach to learning.

During the focus group, the study participants indicated that wikis and weblogs can be used to support deep approaches to learning only when the teaching strategies and assignments for a course are intentionally designed to facilitate and assess peer collaboration and self-reflection. They indicated that over the semester their workload increased in all of their courses forcing them to adopt a superficial approach to learning due to lack of time and the increased stress of trying to complete major assignments, which were all due during the final portion of the semester.

The students also provided a series of examples of how wikis can be used by:

- *Students* to create online journals, lab books, research notebooks, e-portfolios and even online textbooks for their own benefit, or for peer or teacher review.

- *Faculty* to communicate with their students and to collaborate on research and writing projects with their peers (i.e., textbooks, articles) through the collection of

ideas, papers, timelines, documents and study results within a collective digital space.

- *Departmental personnel, instructors and teaching assistants* to organize and discuss common course assets such as syllabi, office hours and assessments without having an endless e-mail chain or difficult to schedule face-to-face meetings.

- *Conference organizers* as a means of planning, coordinating and implementing events.

And, in terms of weblogs students suggested that they could be used to:

- Replace the standard course web page. Teachers can post class times and guidelines, assignment notifications, suggested readings, and exercises.
- Annotate and link to Internet-based resources that relate to courses.
- Organize and facilitate course based discussions.
- Create summaries of course activities and readings.

Conclusion and Recommendations

The findings from this study suggest that teaching strategies and related assessment frameworks which encourage students to engage in reflective learning practices can positively contribute to deep approaches to learning. Wikis and weblogs can be used to support peer review and reflection only if students' perceive that these digital tools help make these processes more effective and efficient.

Wikis have recently emerged as a very powerful digital tool for supporting student collaboration. Their flexibility, ease of use, and low barrier to entry makes them equivalent to "digital paper" (Lamb, 2004). Higdon (2005) suggests that wikis allow students to co-construct meaning in a democratized digital space, and Fountain states that the use of wikis to support collaborative projects helps "promote 'pride of authorship' and ownership in the team's activities" (2005, p. 8). In addition, weblogs offer students a high level of autonomy while creating a new opportunity for interaction with peers. Blogs provide a forum for discussion that goes beyond coursework to include culture, politics, and other areas of personal exploration (Downes, 2004). Students often learn as much from each other as from teachers or textbooks, and weblogs offer an effective medium for peer-to-peer knowledge sharing and application.

In terms of recommendations, the student participants suggested that due dates for major assignments should be scheduled throughout the semester, rather than just during the final weeks of the term, in order to allow them the time to develop a deeper approach to their learning. In addition, the participants stressed that higher education institutions should make a greater effort at coordinating course learning outcomes, activities and use of technology within an academic program (i.e., Bachelor of Education program). The

students indicated that this would help them adopt a deeper approach to the learning by being able to make clearer connections and links between the courses. They also suggested that wikis and weblogs should be used throughout an entire program, rather than in just one course, in order to help them facilitate ongoing collaboration and reflection within a personal learning "space" or environment.

References

Biggs, J. B. (1987). *Student approaches to learning and studying*. Melbourne: Australian Council for Educational Research.

Biggs, J. (1988). Assessing student approaches to learning. *Australian Psychologist, 23,* 197–206.

Creswell, J. W. (2003). *Research design: Qualitative, quantitative, and mixed methods approaches* (2nd ed.). Thousand Oaks, CA: Sage.

Downes, S. (2004). Educational blogging. *EDUCAUSE Review, 39*(5), 14–26.

Entwistle, N. J. (2000). Approaches to studying and levels of understanding: The influences of teaching and assessment. In J. C. Smart (Ed.), *Higher education: Handbook of theory and research, XV* (pp. 156–218). New York: Agathon Press.

Ehrmann, S. C. (1998). Studying teaching, learning and technology: A tool kit from the Flashlight Program. *Active Learning, 9,* 38–42.

Ferdig, R., & Trammell, K. (2004, February). Content delivery in the 'Blogosphere.' *THE Journal*. Retrieved August 25, 2006, from http://www.thejournal.com/articles/16626_6

Fountain, R. (2005). *Wiki pedagogy*. Retrieved February 25, 2006, from http://www.profetic.org:16080/dossiers/rubrique.php3?id_rubrique=110

Higdon, J. (2005, November). Teaching, learning, and other uses for wikis in academia. *Campus Technology*. Retrieved August 25, 2006, from http://www.campus-technology.com/news_article.asp?id=17502&typeid=156

Lamb, B. (2004). Wide open spaces: Wikis, ready or not. *EDUCAUSE Review, 39*(5), 36–48.

Laurillard, D. (1993). *Rethinking university teaching: A framework for the effective use of educational technology*. London: Routledge Falmer.

Leuf, B., & Cunningham, W. (2001). *The wiki way: Quick collaboration on the web*. Boston, MA: Addison Wesley.

Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry*. Thousand Oaks, CA: Sage.

Marton, F., & Saljo, R. (1976). On qualitative differences in learning. Outcome and process. *British Journal of Educational Psychology, 46,* 4–11.

Moon, J. (2004). *A handbook of reflective and experiential learning*. London: Routledge Falmer.

Ramsden, P. (2003). *Learning to teach in higher education* (2nd ed.). London: Routledge Falmer.

Rhem, J. (1995). Deep/surface approaches to learning: An introduction. *The National Teaching & Learning Forum, 5*(1), 1–2.

Svensson, L. (1977). On qualitative differences in learning. III — Study skill and learning. *British Journal of Educational Psychology, 47,* 233–243.

Trigwell, K., Prosser, M., & Waterhouse, F. (1999). Relations between teachers' approaches to teaching and students' approaches to learning. *Higher Education, 37*, 57–70.

Appendix: Pre-Study Student Survey Questionnaire

The purpose of this beginning of the semester survey is to provide me with an understanding of your previous computer experience and your approaches to studying and learning. All responses will be kept confidential. Please respond to all questions and then click on the Submit button at the bottom of the page.

1. Gender

    Male

    Female

2. Age

    15-29

    20-25

    26-30

    31plus

3. Previous experience with a higher education course which uses computer based technology before (e.g. web site, e-mail, online discussion forums)?

    Yes

    No

4. If yes, did the course include any of the following features (please select the dominant item)?

    A web site (e.g. Blackboard)

    E-mail communication

    Online discussion forums

    Chat sessions

    Quizzes and/or surveys

5. Personal rating of computer skills

> Novice (not really comfortable using a computers)

> Intermediate (comfortable using a computer)

> Advanced (have developed some expertise and enjoy using a computer)

6. Home internet access

> Yes

> No

7. In the space below please describe the grade level/subject areas that you are interested in teaching.

To what extent do you agree or disagree with the following statements about your studying and learning preferences.					
Statements	Please select one of the following five choices for each statement				
	Strongly agree	Agree	Neither agree or disagree	Disagree	Strongly disagree
8. I find I have to concentrate on memorizing a good deal of what we have to learn in a course.					
9. I try to relate ideas in one subject to those in others, whenever possible.					
10. I usually don't have time to think about the implications of what I have read for a course.					
11. I usually set out to understand thoroughly the meaning of what I am asked to read for a course.					
12. Although I generally remember facts and details, I find it difficult to fit them together into an overall picture.					
13. In trying to understand new ideas, I often try to relate them to real life situations to which they					

	might apply.					
14.	I find I tend to remember things best if I concentrate on the order in which the lecturer presented them.					
15.	When I'm tackling a new topic, I often ask myself questions about it which the new information should answer.					
16.	I tend to choose subjects with a lot of factual content rather than theoretical kinds of subjects.					
17.	In reading new material I often find that I'm continually reminded of material I already know and see the latter in a new light.					
18.	I find it best to accept the statements and ideas of my lectures and question them only under special circumstances.					
19.	I spend a lot of my free time finding out more about interesting topics which have been discussed in classes.					