Collaborative Sensemaking in the Blogosphere

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Abstract

This paper presents a case study of a class of students co-blogging throughout the semester. The students collaboratively made sense of the course material. The class blogosphere became a repository of interpretations, reflections, opinions, monologues and dialogues about the course content. Over the course of the semester there was an aggregation of "sense made" that was "mined" by the students throughout the semester. The data shows that students leverage the contributions of other students when authoring their own posts and later when they write papers.

Keywords: Collaborative sensemaking; Online discourse communities; Co-blogging; Education; Case Study; Field study; Ethnography

Introduction

In a class it is not enough just to remember or retain the information that is presented, it must be "digested" or understood (Dewey, 1964: p. 249): "Of course intellectual learning includes the amassing and retention of information. But information is an undigested burden unless it is understood. It is *knowledge* only as its material is *comprehended*. And understanding, comprehension, means that the various parts of the information acquired are grasped in their relations to one another – a result that is attained only when acquisition is accompanied by constant reflection upon the meaning of what is studied. "

The in-class lecture and discussion provides an explanation of key concepts within the course content and a causal story about how the parts are connected. A student begins to learn the background knowledge, a foundation and framework for understanding the course material. The acquisition of this kind of background knowledge prepares the student for being able to produce causal explanations of key ideas, the relations between issues, and the connections between conclusions drawn from different evidences. Acquiring the background knowledge is a good part of what any course is about.

In itself, the in-class lecture and discussion is not enough to achieve a deeper understanding of the material. Other activities, including carefully reading the course texts, doing homework, and studying for exams, are exercises that help students "digest" material. Finding venues for students to cooperatively verbalize, explain, and discuss undoubtedly has positive educational value. However, finding a time and place for students to meet is a significant barrier for creating collaborative sensemaking opportunities.

This paper explores the value of online co-blogging as a discourse community that provides an arena for the students to work together and collaboratively make sense of the ideas and concepts taught in the class. The blogosphere is a play space for students to work at "understanding" the course material, even though the students work at different times and in different locations. Activity in the blogosphere is an opportunity to reflect, verbalize, get feedback, read alternate interpretations of the same material, and discuss: the students collectively make sense of the course material. There is a clear boundary between those items which are jointly made sense of in the blogosphere and those that are not.

This paper will present a case study of an interdisciplinary class on Internet & Society where the students co-blogged throughout the semester. The blogosphere provided an intersubjective space in which the students collaboratively worked at making sense of the lecture and course texts. In the blogosphere, the students created *common* and *background knowledge* (Lee, 2001). The data shows that the students drew on the sensemaking of other students that aggregated during the semester in support of their own individual sensemaking.

Co-Blogging

In a student co-blogging community, each student has a *blog*. The blog is composed of multiple *posts* written by the blog owner. Blog posts can summarize the key content of a text that was read for class, or develop an argument on some issue that was discussed during lecture. Students can read each other's blog posts and *comment* on them. A discussion emerges when a blog attracts a lot of commentary from other students. Blogging on the course material is a learning activity that invites reflection and self-explanation and improves learning. Reading and commenting on each other's blog posts provides students with other interpretations of the course material and the opportunity to discuss the content of the readings, which also helps learning.

In-class discussions have significant time constraints. Online, students can converse – and (co-)reflect – at their leisure, when they are prepared. Because co-blogging is a text-based community, literal quoting of the text is easier to do: the data shows that in many cases, students literally copied, or paraphrased, a small portion of an assigned reading in order to focus their blog post. Perhaps these kinds of activities occur in an in-class discussion, but since face-to-face discussions are serial there are fewer opportunities for students to present different quotations from the text or alternative viewpoints on the same quote.

The co-blogging community is social and student-owned (Oravec, 2002). Because each student has her own blog, she has full control over the content and can establish personal and intellectual ownership of her work (Fredig & Trammell,

2004). Because co-blogging is Web 2.0 technology, the "buy-in" for students is fairly cheap (Glogoff, 2005; Duffy 2008). Because co-blogging occurs outside the bounds of class time and it is an asynchronous learning activity that does not require the student be collocated, it expands the opportunities for co-reflection and fruitful discussion.

In contrast to discussion forums, in a co-blogging learning activity, students develop individual identities: each student has her own blog. In a discussion forum each discussion has a deep tree structure, and in the blogosphere, the range of discussion is broader with multiple viewpoints, and conversations, emerging. In a discussion forum, because of "the branching structure, the large proportion of messages that terminated branches, and the abstracted nature of student interaction demonstrate an overall incoherence in online discussion. ... Leads to poorly interrelated monologues." (Thomas, 2002). In the blogosphere discussions develop as smaller chunks of interaction. Where the comments of an individual student can be buried in an extended discussion in a discussion forum, in the blogosphere every student blog attracts a significant amount of attention (Larusson & Alterman, 2009).

When a student writes a blog post she has the opportunity to practice producing a narrative about the significant elements of the course material, making sense of the causal relations among the different elements of the course content (Williams & Jacobs, 2004). Co-blogging creates opportunities to exchange, explore, and present alternate viewpoints (Fredig & Trammell, 2004). It potentially exposes students to alternate ways of "seeing" and "constructing" what is significant and why (Oravec, 2002; Fredig & Trammell, 2004).

When a blog post attracts commentary, it serves to coordinate the students' work at aligning their views. In this manner, the students can work "through" (Bødker, 1990) a post or discussion together, working at different times in different places to reach a common understanding. Discussions on issues related to the course material naturally emerge, enabling students to collaboratively work through the arguments and trade-offs, weighing and comparing different explanations and justifications (Okada & Simon, 1997), which positively impacts learning (Andriessen, 2006).

The discussions that emerge among the students create a dimension of interactivity. Some students comment (interact) more frequently than others (Rafaeli & Sudweeks,1998). Each comment can be classified by its level of interactivity. Comments on posts can either elaborate or negotiate (Thomas, 2002). Comments can either be reactive, refer to a prior point in the emerging discussion, or they can be interactive, i.e. "recount the relatedness of earlier messages" (Beuchot & Bullen, 2005; Rafaeli & Sudweeks,1998).

Case Study

In the Internet & Society course taught in Fall 2008, 25 students collectively blogged throughout the semester. The course was an introductory course. Students in the class were from a variety of disciplines. There were 8 females and 17 males. All of the students were undergraduates. There were 3 science majors and 1 science minor in the class. There were 12 students majoring in the social sciences and 8 minoring in the social sciences. The remainder of the class was either in the humanities or fine arts.

The focus of the analysis presented in this paper is on the co-blogging work that the students did during the time the class read two of the books that were required reading. The students wrote a short paper on each of these books.

Methods

All of the students' online work was automatically recorded in a transcript, which enabled both quantitative and qualitative analyzes. The transcripts can be treated as an event log file and accessed using database queries. Additional tools enable a larger variety of alternate analysis methods, including discourse, conversation, or interaction analysis. One tool replays the transcripts just as if one was viewing a videotape showing the evolution of the blogosphere. Another tool makes it easy for an analyst to systematically annotate, and tag each of the posts and all of the discussions that emerged.

If a student used a newsletter to navigate to the blogosphere, it was possible to determine that the student read the newsletter and also which conversation or post was their destination. If a student's email client automatically viewed emails in a HTML format, it was possible to track whether a student opened a newsletter even if they did not navigate from the newsletter to the blogosphere. It was not possible to determine which parts of the newsletter were read.

At the end of the semester we distributed a survey, questions were on a 6-point Likert scale (from 1, not useful, to 6, very useful). The survey provided some data on the students' perception of the academic value of the learning exercise and the functionality and practicality of the collaborative technology. The survey also included open-ended questions.

Metrics

Lectures were presented using slides that summarized the key points of the presentation. At the beginning of each lecture, hard copies of the slides were handed out to support student note taking. PDF versions of the slides were downloadable from the class website.

The lecture slides were used as a basis for identifying the inputs to the blogosphere. For each set of slides, the instructor identified a set of key topics that were covered by the lecture. For each topic a tag was created that was organized into a taxonomy and treated as the potential input to the blogosphere. All posts and comments in the blogosphere were tagged using these topic/tags; this roughly identified the content of each contribution. When the students post on these topics they are reflecting on important course content. One way to measure the impact of a given post is to count the number of comments or reads that it accrued.

Procedure

At the beginning of the semester, an in-class tour and exercise introduced the students to the important features of the co-blogging environment. The students were required to blog at the pace of one post per lecture: there were two lectures per week. A typical post was 1 or 2 paragraphs in length. The students were also required to read and comment on other contributions to the blogosphere. The co-blogging work of each student counted for 35% of his or her grade. Students had the option to opt-out of the study. No student opted-out of the study.

During the semester the students read four books. The students wrote short papers on two of these books. The focus of the analysis presented in this paper is on the co-blogging work that the students did during the time the class read the two books for which they wrote papers.

The Co-Blogging Environment

The co-blogging environment has been developed over a number of years in several different courses following the *design-based research* methodology (Barab, 2006). It is implemented using the Wiki Design Platform (WDP), which is a wiki-based educational platform that supports a variety of collaborative learning activities (Larusson & Alterman, 2009).

In the co-blogging environment, each student has a blog. Each blog post shows a picture of the author, a title, and tag that relates the post to a lecture given in class. At the bottom of a post there is a list of people who read the post. Any threaded discussion that emerges is shown below the relevant post. As a student writes her blog, she can read another student's post on the same topic with a click of the mouse. At the "front entrance" to the blogosphere, there is a list of the ten most recent posts or comments on posts. Each item in the list displays the name of the author of the post or comment and a short excerpt from the contribution. Students can also access the blogs via a word cloud or by searching the content in the blogosphere using keyword(s) or tag(s).

Students receive daily email newsletters that summarize the online co-blogging activity of the class in the previous 24 hours. The newsletter lists the title, author, and first line of all the newly created blog posts, and a list of similar information for any new comment. Students can use the links on the newsletter to directly navigate to any post or comment on the blog site that is of interest.

In the blogosphere there are two ways to be a *primary participant*: author a blog or act as a discussant on another student's blog (Alterman & Larusson, 2009). *Secondary participation* occurs when a student reads either a post or a discussion that has emerged online. A *tertiary participant* reads a brief description of a recent post or a new comment on a post in a newsletter. The students can assume different participant roles at different times. A student can be the author of a post, a contributor to a conversation initiated by a post, a reader of a post or conversation, or an interested party who reads about the post or conversation in a daily newsletter. Secondary and tertiary participation are more peripheral kinds of participation.

Evaluation

Responses to the survey were positive. When the students were asked to rate the value of their online co-blogging work as a means of giving them first-hand experience with online collaborative learning, the average response was 5.6. In response to the question of whether the students felt the co-blogging community was useful, the average response was 5.3. When queried about the usefulness of the blogosphere for writing papers, the average response was 4.5. When asked as a yes/no question whether re-reading and reusing the blogging text helped the students write their papers, 67% answered in the affirmative.

There were a total of 155 blog posts, 113 comments, and 1010 reading events on the two books that are the focus of this study. There were 31 conversations of length 2, 15 of length 3, 7 of length 4, and 7 of length 5. The average conversation length was 2.85. The length of a conversation is defined as the number of contributions that were made to the discussion. For example, a post that receives one comment is a conversation of length 2.

There was no correlation between the number of tags on a given post and how often it was read; many of the best posts were thoughtful commentaries on a single topic. There was no correlation between the length of a conversation and the number of tags garnered in the conversation. There was, however, a strong positive correlation between the length of a conversation and the number of read events ($r(151) = .061, p < .01$).

Participating in the blogosphere

Students made two kinds of contributions to the blogosphere. As a *blogger*, each student produced an open journal, a monologue about the course content. As a *discussant* each student participated in a dialogue about the content of one or another post.

As a blogger, a student posted her reflections on some part of the course material. A blog post could refer to the text or quote the text; this occurred 75 times during the time the students co-blogged on the two books (roughly 48%). A post could refer to the lecture, an issue that was discussed in class, another blog, or to an outside article, site, or book (26 times; roughly 17% of the time for the two books). Frequently students included personal experiences or anecdotes as part of their post throughout the entire semester (73 times; roughly 14% of the time), and less frequently during the time they co-blogged on the two books (8 times; roughly 5%). Each of these were ways to initiate reflection.

Within the blogosphere, the monologues of the students were published and broadcast to the rest of the class, emerging in an open space, giving students exposure to multiple viewpoints and voices. Students viewed the same material

differently. Their different articulations complemented, regulated, or clashed with one another. All voices could "be heard". The ratio, the balance, of these voices potentially gave a student a textured view of the course material. By means of *perspective-taking* an intersubjective space emerged (Tomasello et al, 1993).

In addition to authoring posts, students acted as discussants on each other's posts. Much of the commentary was either an agreement with, or an expatiation of, another student's point (49 times during co-blogging on the two books; roughly, 43% of the comments). These sorts of confirmations moved the students towards creating a common understanding of a particular interpretation of some portion of a text or lecture. Sometimes a student posed a question or asked for a clarification in her blog or comment, which was answered later by the comment from another student (10 times; roughly, 9% of the comments on posts for the two books). Other responses were more discursive: students frequently disagreed, espousing different viewpoints on the same topic (52 times; 49% of the comments). Comments were linked to other posts (2 times; roughly 2%). Comments either referred to the initial post (102 times; roughly, 90%) or another student's comment on the post (14 times; roughly, 12%).

Intersubjective space

Participation in the creation and use of information in the blogosphere results in learning and the production of `common knowledge`. The students work together to "digest" the information that is presented during lecture or in the course texts.

The total number of additions to the blogosphere is a rough measure of the amount of information "digested" by the class while participating in the co-blogging exercise during the semester. One of the topics in the Internet & Society class was the advantages and disadvantages of "working home alone" as opposed to working in an office with your collaborators. Let x_1, x_2 ... represent the advantages and disadvantages of working home alone. Table 1 shows an idealized representative example sequence of events in the blogosphere that are ordered in time. At times t_1, t_2, t_3, and t_4 interpretations of content presented in the text or lecture are aggregated: x_1, x_2, x_3, and x_4 are added to the blogosphere.

Table 1: A sequence of events in the blogosphere.

Time	Event
t_1	Joe posts a blog on "working home alone", x_1.
t_2	Mary reads Joe's post x_1 and posts comment x_2 .
t_3	Mary posts a blog on "working home alone", x_3.
t_4	Joe reads Mary's comment on his post and replies. x_4.
t_5	Ed reads the conversation between Mary and Joe.
t_6	Ed reads Mary's post on "collocation".
t_7	Mary reads Joe's reply to her comment on x_1.

What each student learns, how much each student learns, and to what degree the students learn the same things, is all variable. The extent to which students converge on a set of agreed upon factors and arguments concerning some key concept is an open question. The degree to which the students share their beliefs is not clear either.

Common ground is defined in terms of a belief about some proposition p: p is a part of common ground for a set of actors if they all believe p and they believe that the other actors also believe p and that those other actors believe that they believe p and so on (Clark, 1996; Clark & Brennan, 1991). For the sequence shown in Table 1, at no point does it appear that Mary and Joe have attained *common ground* on x_1 (common ground: Clark & Brennan, 1991). At time t_4, Joe knows Mary read his post. At which point he may or may not believe that she understood his contribution. Suppose Joe believes Mary understood his contribution, he still does not know if Mary believes that he believes she understood his contribution. At time t_7, were Mary reads Joe's reply to her comment, even if Mary believes Joe believes she understood his contribution, Joe will not know that.

Lee (2001) makes a distinction between common, shared, and mutual knowledge. Each of these are distinguished by the *certainty of sharedness*. `Common knowledge` between two individuals is assumed to be held commonly by those individuals because that knowledge is considered to be general background knowledge within a community of which they are both a part. "`Shared knowledge`, on the other hand, is that information which has been established as shared as a result of interaction and discussion." `Mutual knowledge` requires an infinite regress of mutual belief, the certainty of sharedness is 100%. In the case of the sequence of events shown in Table 1, is common or shared or mutual knowledge established?

Lectures and student activity in the blogosphere are good venues for establishing common knowledge (background knowledge). Key points in an assigned reading or a lecture are likely to be `common knowledge` for the students; only likely because not all students read the assigned material or attend, or listen closely to, lectures. Sharing of knowledge within the blogosphere is asymmetric. When a student writes a post in the blogosphere and another student reads it, the second student believes she has `shared knowledge` with the first but not vise versa. So, for the sequence of events in Table 1, at time t_2, Mary believes she `shares knowledge` of x_1 with Joe, but Joe does not believe he `shares knowledge` of x_1 with Mary until time t_4. At time t_5, Ed may believe he `shares knowledge` of x_1, x_2, and x_4 with Joe and Mary, but neither share that with him. And so on.

In a face-to-face interaction, beliefs are grounded from a sequential interaction. In an online community, because all the students are not always together at the same time in the same place, `common` and `shared knowledge` emerges intermittently and non-uniformly; it is not clear that `mutual knowledge` ever emerges from the blogosphere alone. Many of the things the students learn/know as a result of their participation in the blogosphere are beliefs that may be held in common and shared but they are not mutually known.

During the co-blogging activity

Table 2 shows that on average 57% of the topics a student "considered" in the blogosphere were those the student wrote

about in one or another of her posts. On average, the other 43% of the topics that a given student "considered" occurred as a result of commenting or reading in the blogosphere. The variance is high for these numbers because there were a few students who were not very active at all.

Table 2: Learning from other students.

	Average	Median	Stdev
Blogging	57%	55%	22%
Commenting	12%	8%	15%
Reading	31%	28%	20%

These numbers do not reflect the fact that many of the students took advantage of a feature of the blogosphere environment that made it easy for a student writing a blog post to read other posts on the same topic. Over the entire semester, there were 13,408 reading events, 4,693 of them occurred while students were authoring blog posts (roughly 35%). Thus students were able to "mine" other interpretations of the same content even while they were authoring blogs.

While writing papers

Figure 1 shows how activity within the blogosphere exposed students to topics that were later included in one of the two papers they wrote.

1. The y-axis compares the number of topics/tags assigned to each student's posts and comments (primary participation) to that number for the same student's topics/tags in his or her paper. A positive number means that more of a student's paper was composed of topics they contributed initially in the blogosphere. A negative number means that a majority of the content in a student's paper did not originate in contributions to the blogosphere.
2. The x-axis computes a similar number for reads (secondary participation). A positive number means that more of a student's paper was composed of topics they read about in blogosphere prior to writing their paper. A negative number means that a majority of the content in a student's paper did not originate from reading in the blogosphere.

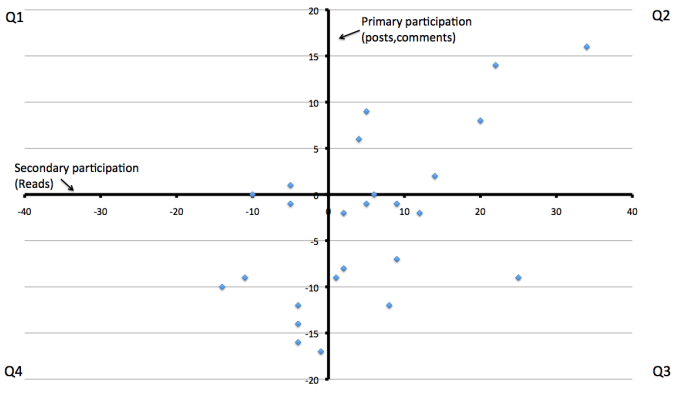

Figure 1: Influence on paper writing.

Consider each of the four quadrants of the graph starting in the upper left-hand quadrant:

Q1: Primary participation provided preparation for writing papers.

Q2: Primary and secondary participation provided preparation for writing papers.

Q3: Secondary participation provided preparation for writing papers.

Q4: Primary and secondary participation provided some help, but most of these papers were derived from work that was not influenced by a student's activity in the blogosphere.

For 16 of the 25 students, their work in the blogosphere provided background for the majority of the concepts that appeared in their two papers (their data is either positive on the x-axis or y-axis). The largest group of students (Q3) benefited most from the reading. The next largest group (Q2) benefited significantly from both primary and secondary participation in the blogosphere. These data confirm that students were "mining" the blogosphere to support their understanding of the material.

Figure 2 shows the correlations between the preparation for writing papers provided by reading, posting blogs, commenting, or doing all three. The trend line for all three activities combined is significant and positive ($r(23) = 0.485, p < .05$). The trend lines for reading ($r(23) = 0.402, p < .05$) and posting ($r(23) = 0.419, p < .05$) are also significant and positive. The trend line for commenting was not significant.

Discussion

Think of the blogosphere as a play space for students to work at "understanding" the course material. The blogosphere is an opportunity to reflect, verbalize, get feedback, read alternate interpretations of the same material, and discuss. The students are collectively making sense of the course material. The students leverage the aggregate online collaborative sensemaking throughout the semester.

The students produce multiple interpretations of the course material. The students reflect on the meanings of the assigned readings or a lecture given by the instructor in class. Frequently, posts include personal experiences or anecdotes. Comments on posts agreed with, or expatiated upon, another student's contribution; they also took contrasting views. The students are *many working minds* collaboratively making sense and creating `common` and `shared knowledge`; enabling many minds to work together is a significant outcome of Internet technology (Sunstein, 2006).

The blogosphere became a repository of interpretations, reflections, monologues and dialogues about the course content. At various points in the semester the students chose to *mine* the aggregated sensemaking. Because posts and discussions, once created, persist and can be re-considered at a later time, students can increase their common and shared knowledge throughout the semester.

On many occasions, as students composed their own posts, they first sampled another student's interpretation of the same lecture point or text. Right before a paper deadline, the students did heavy reading in the blogosphere in order to access

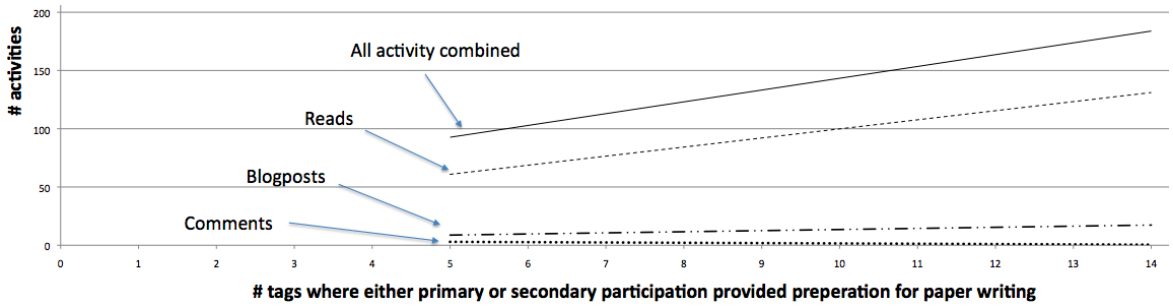

Figure 2: How different kinds of participation affect each student's preparation for writing a paper.

and review ideas, arguments, examples that were relevant to the paper they were writing, reproducing, in their own words, the content of relevant posts and discussions found in the blogosphere.

Concluding Remarks

During the semester, common and background knowledge is created by collaborative work in the blogosphere. The individual contribution of each student is an investment, the return on their investment is increased by the collective work of the class. The collective work of the class in the blogosphere produces multiple reflections on the course material. Students enrich their understanding by reading or commenting on the blogs and comments of other students.

The quantitative data from the case study shows that the students *mine* the blogosphere throughout the semester. When students write blog posts, 35% of the time they read other related contributions to the blogosphere first. On average 43% of the topics that a given student wrote about in an assigned paper was presaged by their participation in the blogosphere. The data also shows that for 16 out of the 25 students, the majority of the topics that appeared in their papers were first "played with" in the blogosphere as either a primary or secondary participation; the largest group of students benefited most from reading in the blogosphere. Finally, the data shows that there is a significant positive correlation between preparation for writing papers and a student's reading and posting activities in the blogosphere.

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