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Using Social Annotation Tools to Foster Collaborative Learning

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Abstract: Social annotation (SA) allows learners to highlight and comment on web pages and share annotations with each other online. Despite its potential in promoting collaborative learning, how to integrate it into educational settings has not been fully studied. This study aims at introducing and exploring three different ways of incorporating SA-based activities into an online course: (a) peer review; (b) annotated discussion; and (c) collaborative reading. Students participated all three SA-based activities and took a survey at the end reporting the effectiveness of these activities. In this proposal we reported the initial findings of student participation in the three collaborative learning activities.

Introduction

Social annotation (SA) tools are one type of online application that enables multiple learners to annotate and comment collaboratively on content material synchronously or asynchronously on the web. In contrast to traditional text-based annotations that are hard to share among learners, social annotation tools allow learners to work continuously and collaboratively on one file, and the annotations and comments are automatically stored in an online database for everyone to review (Novak, Razzouk, & Johnson, 2012). Essentially, social annotation tools promote collaboration by eliminating the back-and-forth information exchange process and enabling real-time learner-centered collaborative annotation (Nokelainen et al., 2005; Su, Yang, Hwang, & Zhang, 2010).

SA-Supported Collaborative Learning

SA tools are an emerging technology that has not yet been widely used or investigated in education, and related research is still scarce (Novak et al., 2012). Nevertheless, due to the social and collaborative nature of SA tools, there has been research conducted to examine the incorporation of SA tools to support collaborative learning (Glover, Xu, & Hardaker, 2007; Hwang, Wang, & Sharples, 2007; Johnson, Archibald, & Tenenbaum, 2010; Nokelainen et al., 2005; Samuel, Kim, & Johnson, 2011). The current research demonstrated that SA tools has been primarily used for reading comprehension, peer review and other types of collaborative learning activities.

As to support reading comprehension, the integration of SA tools could take different forms depending on how the instructor sets up the collaborative learning activity. One popular use is to engage learners in reading comprehension activities (Johnson et al., 2010; Kawasaki, Sasaki, Yamaguchi, & Yamaguchi, 2008; Razon, Turner, Johnson, Arsal, & Tenenbaum, 2012; Sakar & Ercetin, 2005; Samuel et al., 2011). In such activities, learners are instructed to read learning materials available on the web or provided by the instructor. Using a social annotation platform, learners can interact with learning materials and each other by adding markups and annotations as the material is being read.

Peer review is a type of collaborative activity commonly used in the classroom, where instructors ask the students to write their reflections, share with one another, and critique each other's work in small groups (Mendenhall, 2010; Samuel et al., 2011; van der Pol, van den Berg, Admiraal, & Simons, 2008). SA tools afford peer review activities by providing a convenient platform in which interactions among peers can be seamlessly accomplished. Peer review with SA tools can occur synchronously and asynchronously to support student learning. In one study (Mendenhall, 2010), students were grouped into pairs providing feedback to one another. The feedback could be either general (one that is not linked to a specific portion of the text) or specific. Mendenhall (2010) asserted that the use of SA tools allowed students to focus on specific portions of the text during the critiquing process. However, research that examines SA-supported peer review activities remains limited.

Research Questions

In this study, we examined three different SA-supported activities in an online course. We showcased the activities we designed and implemented for different educational purposes, and addressed the following research questions by analyzing data collected from the survey, along with students' online annotations and markups. We used the following research questions to guide our research:

- 1) How did students participate in the three collaborative SA-supported activities?
- 2) How did students perceive the effectiveness of the SA-supported activities?
- 3) What were the perceived challenges and limitations of integrating SA tools into teaching and learning?

Methods

Participants were seven graduate students taking an online class on Instructional Design. The average age of this group is 38, among which three were between 20 to 30 years old, two between 31 to 50 and two above 50. Most participants reported to possess a high level of technological literacy. All of them have had experience taking online course prior to this course.

In this study, three different SA-Supported instructional activities were designed and implemented. The first one was a peer review activity that was embedded in a module on reflective learning to engage students in a reflective learning process. Students could choose to use Crocodoc, a specific SA tool, to provide specific comments or to provide general comments within the Wikispaces learning environment. The second activity was an annotated discussion where students were required to use the annotation/commenting function embedded in Wikispaces to discuss with their classmates on a wiki page on specific learning contents. The third activity was a collaborative reading activity in Crocodoc. The collected data included formative data generated from the three collaborative activities and student responses to a survey at the end of the course. The survey consists of three sections: (a) questions on students' overall enjoyment of using SA tools in this course, (b) questions on students' perceived effectiveness of using SA tools in the three collaborative activities, and (c) students' demographic information.

Results

Instructional Activity 1

In the first collaborative activity, few participants used SA tools to complete the peer review tasks, as their use was optional rather than mandatory. Most reviewers just posted summative comments, and only two used the annotation features to provide specific feedback by highlighting and focusing on particular sections of the lesson plans. Table 1 demonstrates student participation in this activity.

ID	Name	Provided summative review	Provided in-text annotation
1	Kathy	Yes	Yes
2	Alex	Yes	Yes
3	Emmy	Yes	No
4	Roy	Yes	No
5	Candy	Yes	No
6	Melissa	Yes	No
7	Jennifer	Yes	No

Table 1. Student Participation in Peer Review

Instructional Activity 2

In the discussion activity, all seven students wrote responses in the wiki site to the instructor's prompting questions, and five students engaged in collaborative discussion using the SA tool in Wikispaces and provided 15 total comments on the first four posts. On average, each student provided approximately two comments (mean=2.14, SD=1.57). The average length of one post was approximately 112 words. Looking at the 15 comments contributed by seven participants, we found that Alex, Roy, and Melissa were responsible for 11 comments. Other students, such as Kathy and Jennifer, chose only to provide one or two long and elaborative comments. Student participation in this activity is demonstrated in great details in Table 2.

ID	Name	Number of words of each student's post in response to instructor's questions	Number of posts to their classmates' posts per student	Average number of words of each student's replies to their classmates' posts
1	Kathy	458	2	91
2	Alex	524	3	46
3	Emmy	394	1	29
4	Roy	210	4	26
5	Candy	434	0	0
6	Melissa	765	4	35.25
7	Jennifer	508	1	73

Table 2 Student Participation in Collaborative Discussion

Instructional Activity 3

In this activity, all seven participants engaged in the collaborative reading on Crocodoc and generated 26 annotations on the reading material with the SA tool. The average annotation per student was roughly four (mean=3.71, SD=1.70). The average number of words in each post was 45.07 per student. Students who contributed more previously, such as Kathy, Alex and Melissa, remained active in this activity. Although the overall participation using SA tools was presented to be higher, the issue of unequal level of participation remained unchanged. Student participation in this activity is presented in Table 3.

ID	Name	number of posts	average number of words (mean=45.07)
1	Kathy	6	42.33
2	Alex	4	33
3	Emmy	4	20.75
4	Roy	2	34.5
5	Candy	2	76
6	Melissa	5	53.4

7	Jennifer	2	55.5
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Table 3 Student Participation in Collaborative Reading

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