



Social network analysis of peer relationships and online interactions in a blended class using blogs



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ABSTRACT

This study examines the social network of the learner relationships and online interactions in a graduate course using weblogs for writing and sharing weekly reflective journals during a 16-week semester. The social network data of the learner relationships were gathered twice by measuring learners' perceived emotional closeness with other learners. In terms of the online interactions among the learners, the numbers of replies that individual learners had posted to and received from others' postings were respectively calculated and analyzed. The findings from these measures indicated that the social network patterns and values as measured by peer relationships were noticeably changed at the end of the semester, when compared to that at the beginning. The impact of blogging activities on such changes was supported by correlational analysis between the peer relationships in the social network and online interactions through the learner blogs.

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1. Introduction and problem statement

Blogs have become pervasively used for educational purposes in diverse academic areas such as humanities, communications (e.g., Ellison & Wu, 2008), management (e.g. Osman & Koh, 2012), and teacher education (e.g., Laru, Näykki, & Järvelä, 2012). The use of blogs is hypothesized by enthusiasts to enrich interactions among learners and instructors, to improve learner engagement and perceived learning, and to increase learner sense of community to name a few. A review of empirical studies of blogs (Sim & Hew, 2010) reported that there have been two major research topics in this field: (1) describing the usage profile of blogs, and (2) examining the effects of blogging. The former research generally does not involve empirical studies. Of the latter research, most studies have focused on performance or affective outcomes. Those studies typically relied on data acquired through self-reported questionnaires and interviews (Osman & Koh, 2012). As a result, still few empirical studies have examined the effects of blogs on actual learning outcomes (Hall & Davidson, 2007; Sim & Hew, 2010) and it is harder to find studies that focus on learning processes and changes during the learning process through blogging. Besides learning outcomes, it is now important to gain insights into the learning process including changes related to learner relationships in a class and learner interactions with other learners and instructors. Learner

relationships in a class are vital to understand and foster since such relationships mediate online interactions among learners (Wentzel & Watkins, 2002). Thus, it would be valuable to study peer relationships and the patterns of their interactions with one another in a class using blogs.

Among the key challenges for instructors relying upon blogs as an instructional aid is determining how to encourage learners to engage in productive reflection on their learning in order to bring about the desired elaboration of their subject matter knowledge. In general, learning psychologists have found that the more learners reflect and elaborate on newly learned content, the more they will remember later (Driscoll, 2005). According to research from Hall and Davidson (2007), such findings also hold for blogging.

Explorations of the social networks formed or on the road to forming during blogging for reflection can offer a lens into previously hidden aspects of group dynamics in a blended learning environment. The insights into individual bloggers as well as the myriad interaction patterns among bloggers can help produce practical guidelines for encouraging reflection and learner interactions through blogging. So far, few blogging studies described the network patterns of learners' relationships or interactions among learners in learning environments which utilized blogs. Therefore, analyzing the learning processes such as the network patterns of peer relationships and online learner interactions in a class using blogs could contribute to the understanding of learning processes involved in blogging in a blended course.

The purpose of the current study is two-fold. First, the researchers sought to describe the network structure of the learner relationships in terms of perceived closeness and online interactions throughout

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the 'course. Second, they attempted to identify any relationships that existed between the degree of perceived closeness and that of social interactions. The study was constructed to address the following research questions:

1. Did the social network structure of peer relationships change between at the beginning and at the end of the course using blogs?
2. How did the social network of online interactions form through blogging?
3. Is there a significant relationship between the online interactions and the peer relationships?

2. Literature review

2.1. Blogs: individual publishing system with sense of ownership

As a personal online publishing system for content development and management, a blog is considered a Web 2.0 technology (O'Reilly, 2006). Tools for the Web 2.0 grant individuals the power to add content to the Web. Typically the examples of Web 2.0 technology include wikis, podcasts, blogs, online photo albums, social media, and virtual worlds. Some refer to this phenomenon as the "read-write-Web" (Lessig, 2005), in contrast to the read-only Web where users were merely passive consumers of information. Most fundamentally, the read-write Web dramatically enhances the power of individuals and fosters a participatory culture of building, tinkering, learning, and sharing (Brown, 2006). Time Magazine recognized this trend and in 2006 named "You" as the person of the year (Time Magazine, 2006/2007). In effect, it recognized that individuals have increasing power over their online lives, including how, when, and where they learn and from what content. Web 2.0 technologies allowed individuals to generate ideas online instead of just reading and browsing through someone else's Web pages (Grossman, 2006/2007).

Blogging typically does not require a high level of technical skills. Consequently, many institutions and instructors find that blogs can serve as a digital portfolio or repository of personal artifacts of student work (Beldarrain, 2006; Nardi, Schiano, Gumbrecht, & Swartz, 2004). Blogs are characterized as a website with data entries, presented in reverse chronological order (Schmidt, Schönberger, & Stegbauer, 2005). In the field of education, a blog is expected to enable an interactive and, at times, "intercreative" engagement among learners as well as between learners and instructors (Duffy & Bruns, 2006). Bringing blogs into the learning space can facilitate the utilization of its potential educational benefits through activities such as writing, reading, collecting data, and sharing such data with other learners and instructors.

There are numerous other possible uses and benefits of blogs in education. For instance, blogs can promote critical and analytical thinking as the learner takes times to reflect on what was read, watched, studied, or shared (Richardson, 2006). Blogs can also enhance the forms and types of social interaction that can take place in a course or learning experience. In a blog, the participants can extend to distant geographical regions including students taking similar courses at institutions and organizations. Whether local or global, blogs enable "collaborative content creation, peer assessment, formative evaluation of student work, individual as well as group reflection on learning experiences, and up-to-date information regarding changes in collaborative spaces" (Duffy & Bruns, 2006, p. 32). Blogs can be used for reflecting on learning experiences, students' collaboration, and social interactions among students and instructors (Coutinho, 2007). They can be used in the development of authentic learning tasks.

All of these benefits and uses of blogs can also be found in discussion forums of most centralized online learning management systems (LMS) that are usually offered by universities for individual courses in a particular semester. Even though recent LMS systems embed personal blog features, those blogs, naturally, are still highly dependent upon the design of the particular system in which they are used. Most blogs in

education described in the existing literature are used as a centralized content repository which is owned by an instructor. Worse still, as indicated, such course hub sites are often unavailable after the course ends or taken offline after a few years. Compounding the problem, it is not uncommon for an institution to switch to a new LMS system. When this happens, all the previous learner contributions and indications of learning are wiped clean as the system is taken offline. As a result, any powerful learning episodes vanish or may no longer be accessible.

In contrast, individually owned blogs are lasting and accessible until a user decides to close her blog. In their blogs, individual learners are the owners of their own postings and managers of their own site. Learners should feel more ownership of and responsibility for their own blogging, and, in effect, their own learning. Previous studies have reported the potential of blogs to overcome the limitations of learning through computer-mediated communication (CMC) systems such as centralized LMS.

The opportunity for individual ownership is suggested as one of the most critical features of blogs (Bartlett-Bragg, 2003). A sense of ownership enhances the possibility of successful communication (Tolmie & Boyle, 2000) by reducing the anxiety of online communication (Pena-Shaff, Altman, & Stephenson, 2005). Ownership of a blog also shifts the balance of power and control in a course to the learners (Kang, Bonk, & Kim, 2011). In the process, learners become empowered in ways that they previously had not encountered. Blogs as a decentralized or individualized system can create a more comfortable environment to foster the learner reflection and discussion (Karger & Quan, 2004; Lin et al., 2006). However, regardless of these benefits of blogs over traditional CMC, the use of a blog as a centralized system, or hub owned and managed by an instructor mostly for sharing instructional materials, prevents the realization of these previously mentioned merits or benefits of blogs. The use of blogs as an individual publishing system in the present study is intended to build upon many of the potential benefits of blogs mentioned above.

2.2. Interaction and peer relationship in blogs

Chhabra and Sharma (2013) reported the benefits of using blogs as bridging the communications gap among peers and between learners and instructors in a blended learning situation and also in a traditional classroom. When this occurs, it can result in improved performance, attitudes, teamwork, and communication skills. Interactivity is regarded as critical to the success of social network systems (Williams & Jacobs, 2004). In this regard Du and Wagner (2006) reported that blogs can enhance interactivity among users. More specifically, Ferdig and Trammell (2004) argue that blogs can promote interactivity which is conversational and that these interactions can improve student and teacher relationships. The interactivity among bloggers is achieved by reading others' posts and expressing their thoughts by writing comments to the posts (Kim, 2008). It can be enhanced by subscribing to peers' blogs through RSS (Rich Site Summary protocol or Really Simple Syndication), which allows Web users to subscribe to a website's content using news readers or aggregators. RSS automatically informs of updated posts to the subscribers, which reduces the amount of student effort required to visit and check individual sites to see whether new posts have been published. Hain and Back (2008) found the use of RSS increased students' interaction through blogs.

Active blogging can be explained by motivation, in other words, the expectancy of receiving comments to own postings. According to Pena-Shaff and her colleagues (2005), 94% of the students frequently checked whether other students replied to their own posts. The expectancy of feedback motivates participation in online communication and thereby increases the interactivity. Not surprisingly, then, the more comments a student receives from her peers, the more engaged she becomes in blogging (Kim, 2008). As such

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