

# Testing the Benefits of Blended Education: Using Social Technology to Foster Collaboration and Knowledge Sharing in Face-To-Face LIS Courses

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Blended education, which mixes elements of face-to-face and online educational delivery, can occur at the activity, course, program, or administrative level. This study examined the use of student blogs to test the benefits of course-level blended educational delivery for LIS students enrolled in a face-to-face course. Data collected from students' blogs were also used to assess whether Zach and Agosto's (2009) framework for maximizing student collaboration and knowledge sharing in online courses can be applied to face-to-face courses. The study found that blogs successfully supported collaboration and community building because they were well-suited to sharing course-related knowledge and because students encountered few technical barriers. These findings support Zach and Agosto's proposed criteria for selecting technologies to foster increased collaboration and knowledge sharing, e.g., low learning curves and easily facilitated student interaction. The results suggest that blended education can bring many of the educational benefits of online learning to face-to-face students.

**Keywords:** knowledge sharing, collaboration, blogs, case studies, blended delivery

## Introduction

Previous research tells us that “collaborative teaching and collaborative learning are both means of providing students with early exposure to working in a collaborative paradigm” (Gunawardena, Weber, & Agosto, 2010, p. 217). Beyond the professional benefits of teaching students to use technologies that they will need when they enter the workforce, there are several learning and social benefits that can be gained by encouraging online collaboration in the classroom. These include acquiring increased domain knowledge, supporting advanced critical thinking and

problem solving skills, and understanding how people interact in online information environments (Abrams, 2005; Du, Darlington & Mathews, 2007; Lock & Redmond, 2006; Zach & Agosto, 2009). A critical factor in facilitating collaboration and knowledge sharing among students is building a sense of community.

While a large number of studies have investigated the use of technologies for building communities in online courses, few studies have addressed this issue in face-to-face or blended teaching/learning environments. This paper reports on a study that applied a framework designed for maximizing student collaboration and

knowledge sharing in online courses to a face-to-face course to test the collaboration and knowledge sharing benefits of social technologies in the face-to-face teaching environment. Data collected from students in an LIS graduate course demonstrate that the use of blogging was effective to encourage student collaboration and knowledge sharing in the face-to-face course environment. The paper concludes with a discussion of the importance of fostering the development of a “collaborative paradigm” through the use of blended learning environments.

## Literature Review

### *Nature of Collaboration in Educational Settings*

Mattessich, Murray-Close, and Monsey (2001) defined collaboration as “a mutually beneficial and well-defined relationship entered into by two or more organizations to achieve common goals” (p. 4). Ingram and Hathorn (2004) suggested that true collaboration consists of three critical elements: participation, interaction, and synthesis. This means that collaboration in educational settings requires students to move beyond merely dividing up assignments so that each one produces a separate part of a project; true collaboration involves working together on shared tasks to produce jointly-created work that is more than the sum of its disparate parts. As Prince (2004) explained, “The core element of collaborative learning is the emphasis on student interactions rather than on learning as a solitary activity” (p. 223).

There are a number of educational benefits that can be achieved by harnessing true collaboration for teaching and learning. First, when working together on assignments, students engaged in true collaboration construct new knowledge and often come to understand course content (domain knowledge) better and retain it longer than via individual projects

and assignments (Dawley, 2007; Johnson & Johnson, 1990). Researchers have also found a connection between collaboration during learning and development of increased critical thinking skills (e.g. Abrams, 2005; Du, Durrington, & Mathews, 2007; Lock & Redmond, 2006). Based on an extensive literature review and analysis, Prince (2004) concluded that “a number of meta-analyses support the premise that collaboration ‘works’ for promoting a broad range of student learning outcomes. In particular, collaboration enhances academic achievement, student attitudes, and student retention” (p. 227).

There are also social benefits to using collaboration for teaching and learning. Learner satisfaction and engagement are increased when students make social connections with other students (Anderson & Simpson, 2004). There is a strong connection between building a sense of community among a group of learners and harnessing the educational and social benefits of collaboration (Hanna, Glowacki-Dudka, & Conceição-Runlee, Lewis & Abdul-Hamid, 2006; 2000; McElrath & McDowell, 2008). Once students feel a sense of community within a classroom environment, they are more likely to engage in true collaboration, as opposed to merely dividing up work tasks and working independently without meaningful interaction and shared learning.

Arnold and Paulus (2010) showed that using online social networks leads to increased community building among course participants in a blended delivery course. Indeed, technology, especially social technologies, can support community building among groups of learners. Technology can also help to reduce some of the common barriers to effective knowledge sharing, such as distance barriers and time constraints between participants (Hendricks, 1999; Ruggles, 1997). This suggests that social technologies are likely to be especially effective for encouraging collaboration and community building in online and blended courses.

### *Blended Educational Delivery*

Educators are increasingly designing blended delivery methods to combine the strengths of online educational delivery with the strengths of face-to-face educational delivery. Major strengths of online education include structured presentation, convenient dissemination of information, and support for self-regulated learning (Paechter & Maier, 2010). Major strengths of face-to-face education include increased interaction and discourse with the instructor, easier structures for cooperative learning “when learners have to agree on a shared meaning” (Paechter & Maier, 2010, p. 296), and increased “instruction clarity” (Chen & Jones, 2010, p. 20). Blended delivery (also called “hybrid delivery”) involves combining educational delivery via both online and face-to-face elements. Mortera-Gutierrez (2006) called the wide array of methods for mixing face-to-face and online course components, from fully face-to-face to fully online courses, the “blended learning continuum” (p. 314). “This blended learning continuum has produced many teaching, instructional, and learning situations and practices; some with success, others with failures and frustrations for teaching, instructors, and learners” (Mortera-Gutierrez, 2006, p. 314).

Graham (2006) identified the three most common reasons educators choose blended learning: (1) improved learning effectiveness, (2) increased access and convenience, and (3) greater cost effectiveness. Blending can occur at the activity level (combining face-to-face and online elements within one learning activity or assignment), the course level (combining face-to-face and online activities within a single course), the program level (combining face-to-face courses and online courses within an academic degree program), or at the institutional level (combining face-to-face and online activities, courses, and/or programs, with commitment to blended formats at the institutional administration level) (Graham, 2006).

There is sparse research comparing face-to-face and blended delivery educational effectiveness, but initial research does suggest increased learning outcomes for blended delivery (e.g. Chen & Jones, 2010; Jaschik, 2009). Preliminary findings also indicate that undergraduate students have positive views toward blended learning (Ugur, Buket, & Kurbanoğlu, 2009).

In LIS education, additional reasons for testing blended educational delivery include promoting class collaboration and community building, as discussed above, and providing students experience in online mediated environments similar to those that they are likely to encounter in the practice world. Yukawa (2010) argued that “LIS education faces the dual challenges of providing quality online education and preparing future professionals to work and provide services in blended environments” (p. 54), and that blended educational delivery best prepares LIS students for working in those environments.

It appears that blending educational delivery methods at the program level is common in LIS education. Looking at ALA’s list of ALA-accredited master’s programs, as of March 2012 36 of the 58 programs indicated that they offer blended programs, listing “Primarily online with some face-to-face courses required” and/or “Primarily face-to-face with select online courses offered” as distance education options (American Library Association, 2012). It is important that educators offer blending at all levels in order to provide fully integrated face-to-face and online educational delivery:

As we move into the future it is important that we continue to identify successful models of blended learning at the institutional, program, course, and activity levels that can be adapted to work in contexts. This will involve understanding and capitalizing on the unique affordances available in both F2F and computer-mediated or distributed learning environments. (Graham, 2006, p. 19)

It is likely that many of the programs within the pool of ALA-accredited programs also offer blending at the activity, course, and administrative levels, but unfortunately, firm figures are not available. Since blended education does appear to be increasing among LIS programs, it is important to identify the types of tools that will make it most effective.

### *Educational Use of Blogs*

Much of the research on the use of blogs to support learning in higher education examines their ability to facilitate the learning process, to increase peer-to-peer interaction and learning, and to enable increased student control over learning. Similar to this study, all of the studies discussed in this section involved the use of student blogs in otherwise face-to-face courses.

Several studies have found that students perceive blogs not only to facilitate but also to enhance their learning of course content in face-to-face courses (Churchill, 2009; Ducate & Lomicka, 2008; Halic, Lee, Paulus, & Spence, 2010; Sharma & Xie, 2008; Williams & Jacobs, 2004). In a study involving undergraduates taking an elective course, students were allowed either to submit papers as a blog posting available to all students or as a traditional printed paper submitted only to the instructor (Ellison & Wu, 2008). Students reported that they found reading other students' blog postings most helpful for understanding course concepts when they compared them to their own papers and to comments made by other students on their blogs. Churchill (2009) found similar results. In a study of postgraduate students, he found that the majority of the students ( $N = 24$ ) indicated that reading other students' blogs contributed to their learning (88%). Also, this study found that the majority of students perceived comments from other students as contributing to their learning (82%), with instructor comments contributing to their learning at an even

higher rate (92%). Similarly, Halic, Lee, Paulus, and Spence (2010) found that for over three-quarters of the students in their study, the blogs motivated them to think about course-related topics outside of class.

However, the value of fellow students' comments to students' blog posts has received more mixed reviews in the literature. Xie, Ke, and Sharma (2008) evaluated the development of reflective thinking of 44 undergraduate students who posted to a blog each week throughout one semester. They found that the level of reflective thinking increased over the semester, but they also found that peer feedback negatively affected students' reflective thinking skills. Students' assessment of the value of blogs in supporting peer-to-peer learning has also been mixed. In a study on the effectiveness of blogs for learning in a large lecture style undergraduate course ( $N = 67$ ), students were divided on the value of peer comments to learning with 27% agreeing they were valuable, 36% disagreeing, and 37% remaining neutral (Halic, Lee, Paulus, & Spence, 2010). However, the study also found that because of access to other students' blog posts, most students were able to understand a diversity of viewpoints due to the knowledge sharing process.

Evidence supporting the value of blogs for increasing students' sense of community in face-to-face courses has been more uniformly positive (Halic, Lee, Paulus, & Spence, 2010; Sharma & Xie, 2008; Williams & Jacobs, 2004). For example, in a study by Williams and Jacobs (2004), the authors found that 76% of the students who voluntarily participated in an MBA blog felt that it increased the level of meaningful intellectual exchange with other students. Halic, Lee, Paulus, and Spence (2010) found a stronger sense of community and a higher degree of computer expertise were predictors of students' perceived learning, and that blog use contributed to community building.

Another frequently cited benefit of stu-

dent blogs for educational use is increased student control over their learning. For the most part, existing studies indicate that students feel they benefit from personal control over their own blogging experiences. In one such study, Meyer (2010) compared the use of different Web 2.0 tools in a doctoral course. She found that students preferred working with blogs over wikis because their credibility as authors remained visible with blogs, whereas with wikis their individual contributions were lost. However, some studies have indicated that students were concerned about the lack of structure and wanted more detailed guidelines for how to blog and how to respond to others students' blog posts (Ellison & Wu, 2008; Ladyshevsky & Gardner, 2008). On the whole, students across studies have reported that blogs are easy to use and easy to follow and maintain.

### Study Design

This goal of this study was to test the benefits of blended educational delivery in a specific LIS course by assessing the extent to which the benefits of integrating social technology into an online course could be extended to a face-to-face course, creating a blended educational experience for the students. The sample course was previously taught in an entirely face-to-face format. The instructor tested the potential benefits of course-level blending by using student blogs to enable online student interaction among face-to-face students during one semester term.

While blogs are a well-established technological tool with many affordances for communication and collaboration, their influence on collaboration and community building in the face-to-face learning environment cannot be assumed without testing. Hirsch (2005) explained that blogs "are today's equivalent of student journals, but hosted on public Internet sites, moderated and maintained by the owner (student or teacher)" (p. 12). Oravec (2003) suggested that blogs provide a "middle space"

between online and traditional classroom settings (p. 225), making them useful tools for course-level blended educational delivery.

Student course blog content from an on-campus master's level LIS course served as the data for this study. The course, *Adult Reader's Advisory*, focuses on teaching students how to (a) assess library users' reading and information needs and (b) identify appropriate information resources to meet those needs. There were 28 students enrolled in the course, including 23 female students (20 White; three Black) and five male students (all White). With the goal of building a sense of community and fostering interactive discussions of course content, the instructor required each student in the course to create a personal blog using Blogger ([www.blogger.com](http://www.blogger.com)) or Word Press (<http://wordpress.org/>) and to turn in all course assignments via his/her blog. Students were encouraged to follow each other's blogs and to make comments on other students' work throughout the term, as well as to use the blogs as spaces for collaborative work and information sharing.

All student blogs were linked to a central course blog, maintained by the instructor. Specific requirements for using the blogs throughout the term included posting annotated descriptions of six books; posting blog entries about three course-related topics of the students' choosing; and either participating in a reader's advisory role-playing activity with five readers or creating an annotated themed booklist for a public library reader's advisory program.

### Data Collection and Data Analysis

Ten of the 28 student blogs from were picked at random for analysis. The ten selected blog owners included eight females (seven White; one Black) and two males (both White). Data from these ten students' blogs, including posted responses from other students, were analyzed using thematic analysis, "a method for identifying,

analyzing and reporting patterns (themes) within data” (Braun & Clarke, 2006, p. 79). Also called “qualitative content analysis” (Wildemuth, 2009), the process of thematic analysis involves repeated readings of a body of qualitative data to develop and refine thematic categories to address a set of research questions. Thematic analysis can be used in a variety of ways, including for inductive category development or for use in comparing a body of data to a set of predetermined categories. In this case, the categories from Zach and Agosto’s (2009) framework (see Table 1) were used as a list of categories against which to compare the data throughout the analysis process. The written data from the logs were first aggregated into one file for analysis. Data corresponding to each category were then analyzed to determine the extent to which the data as a whole supported or negated each category. The categories from the Zach and Agosto framework are:

- *Keys to Success* for maximizing student collaboration and knowledge sharing. This category includes three key instructor behaviors (participation/engagement, personalization, and facilitation of learning) and two key student behaviors (peer interaction and equal participation).
- *Educational Benefits* of maximizing student collaboration and knowledge sharing. This category includes five sub-categories: connection to practice,

peer-to-peer learning, student control, teamwork skills, and critical thinking skills.

- *Drawbacks* to maximizing student collaboration and knowledge sharing. This category includes four sub-categories: technology overload, technological learning curve, technological incompatibility, and student resistance.

## Results

Data analysis revealed evidence to support two of the three main categories of the framework: *keys to success* and *educational benefits*. Framework sub-categories for which there was strong support included instructor participation/engagement, facilitation of learning, connection to practice, peer-to-peer learning, and student control. There was mixed supporting evidence for student personalization, peer interaction, and equal participation. The two remaining sub-categories were not applicable to the study. The development of teamwork skills was not part of the course design and therefore not analyzed, and, while critical thinking skills were encouraged, data were not collected to enable analysis of critical thinking skills development.

The data did not provide evidence for evaluating the third category in the framework, *drawbacks to maximizing student collaboration and knowledge sharing*, as no student expressed issues related to technology overload, technological learn-

Table 1. Zach and Agosto’s (2009) Online Course Design Framework for Maximizing Student Collaboration and Knowledge Sharing.

Keys to Success	Educational Benefits	Drawbacks
Instructor behaviors:	Connection to practice	Technology overload
1. Participation/engagement	Peer-to-peer learning	Technological learning curve
2. Personalization	Student control	Technological incompatibility
3. Facilitation of learning	Teamwork skills	Student resistance
Student behaviors:	Critical thinking skills	
1. Peer interaction		
2. Equal participation		

ing curves, technological incompatibility, or student resistance within their blog content. No student reported difficulty in creating a blog to the course instructor, and no student voiced any questions or complaints regarding the use of their blogs.

Based on the analysis, the following characteristics were identified in the blended environment:

### ***Keys to Success***

Instructor behaviors:

#### 1. Participation/engagement

*Participation/engagement* describes the instructor's frequency of involvement and level of interest in online content sharing. In general, the more active and engaged the instructor is online, the more active and engaged students become, thereby increasing the amount that they learn from the course (Zach & Agosto, 2009). The blogging format afforded strong instructor participation and engagement. The instructor maintained a high level of participation in the blogs throughout the term, frequently posting comments and highlighting exceptional blog posts by sending links to selected posts to the entire class through e-mail or through in-class handouts. Each time this was done, the instructor integrated ideas expressed by students in their blogs into the course readings and the upcoming lectures and modeled her own engagement in the course.

#### 2. Personalization

*Personalization* refers to the instructor's enabling students to reveal aspects of their personal lives online to increase student social presence and community building (Zach & Agosto, 2009). Levels of personalization varied among student bloggers. Personalization of student blogs was tied to blog impact within the class community. Students whose blogs received the most course-related comments from others tended to include personal introductions within their content, such as

discussions of families, pictures of children and pets, and so on. Interestingly, the students did not post personal comments to each others' blogs. The instructor also responded to each student's course assignment postings. In this way she engaged with each student personally around his/her individual ideas and remained socially present between face-to-face class meetings.

#### 3. Facilitation of learning

*Facilitation of learning* involves the instructor's efforts to encourage students to learn by "actively search[ing] for new information, learn[ing] from each other, and advanc[ing] knowledge" (Li & Akins, 2005, p. 58). To encourage the students' learning from one another, the instructor would highlight particularly relevant blog posts during class discussion and occasionally print out and distribute in class posts that were exceptionally thought-provoking to stimulate debate. Because the students were allowed to write blog posts on the issues and trends in reader's advisory that interested them the most, the instructor could respond to individual posts with specific knowledge or resources relevant to individual interests. In this way, the instructor could help each student advance his/her knowledge on a personal level.

Student behaviors:

#### 1. Peer interaction

*Peer interaction* involves students' discussing course content with each other, working together to understand course concepts, working together to complete assignments, etc. Increased student interaction generally leads to increased student engagement and critical thinking, thus increasing student learning (Zach & Agosto, 2009). The blogging format enabled voluntary and organic collaboration, and the in-class sense of community was enhanced by online interactions among students throughout the term. Students referred to each other's blogs while in the face-to-

face classroom, truly blending the online and face-to-face learning activities. Students also referred to online discussions about community blog posts and to their own blog posts in the classroom. In this way, the collection of blogs documented not only the course products but also the thoughts the course produced, thereby extending and facilitating student learning in the classroom, and encouraging students to think more deeply about course content.

However, levels of peer interaction varied greatly. Table 2 details the total number of comments each student received and the number of unique commenters throughout the course. Within this sample, the number of unique commenters ranged from 1 to 15. Students who authored posts more frequently received comments from more people. For example, the student with only one peer interaction had authored only seven blog posts, whereas the student with 15 unique commenters had authored 35 posts.

Other factors besides how prolific the author was likely influenced the relationship between the number of posts authored and the number of total comments and unique commenters. For example, blog 1 and blog 10 received the same number of unique commenters, but blog 1 received twice as many total comments as blog 10.

Table 2. Number of Comments and Unique Commenters for Each Student's blog.

Blog	Number of Total Comments	Number of Unique Commenters
1	18	7
2	15	5
3	35	15
4	13	5
5	13	4
6	56	13
7	19	9
8	5	1
9	35	9
10	9	7

The author of blog 10 did not start posting until late in the semester; therefore students had less time to interact with his blog.

## 2. Equal participation

Equal participation refers to students' contributing similar amounts of work to collaborative discussions and projects (Zach & Agosto, 2009). Equal participation is a key component to true collaboration. In addition to variance in level of peer interaction, there was significant variance in total participation in the blogging community, with the number of total posts per student varying from four to 34. (See Table 3). The lack of equal participation was partly a function of the blog assignment itself, as opposed to being a function of technological affordances. There were no assigned due dates for posting throughout the term. The influence of due dates on workflow processes would have increased the likelihood of equal participation.

The lack of equal participation among students indicates that infrequent contributors did not engage in true collaboration and that clearer participation requirements—such as specific due dates

Table 3. Total Number of Posts, Posts Not Assigned, and Posts Following In-class Discussions.

Blog Name	Number of Total Posts	Number of Posts Not Assigned	Number of Posts on In-class Discussions
1	12	0	1
2	9	2	0
3*	26	17	1
4	7	0	1
5	9	0	0
6	34	20	1
7	19	6	1
8*	7	2	1
9	20	12	0
10	4	1	0

Blogs analyzed from January 18 through April 8, 2010; \*Blogs existed before class



for contributions—would have balanced participation among class members better and increased overall collaboration. It also means that assignment design is as important as technological affordances in fostering online collaboration.

### *Educational Benefits*

#### 1. Connection to practice

The Master of Library Science is a professional degree, and a strong focus of most LIS graduate programs is on preparing students to work as librarians and information managers. Social technologies are especially effective in providing a *connection to practice* (Zach & Agosto, 2009). The blogging format afforded strong support for connection to practice; the student blogs collectively provided a wealth of resources connected to the real-life practice of reader's advisory. Through their blogs, the students shared their analyses of genre fiction, literary fiction, poetry, and popular non-fiction, resources likely to be useful in professional practice. Additionally, students posted their reading lists and reader's advisory role-playing results, further blending their in-class interactions with their online activities.

#### 2. Peer-to-peer learning

In *peer-to-peer learning*, students' learning moves beyond interaction with the course instructor and with course content via assignments and readings, to learning from knowledge building and sharing with their fellow students (Zach & Agosto, 2009). The blogs afforded strong peer-to-peer learning since the blogging format was well-suited to the course content. An important reader's advisory skill is the ability to match one's understanding of published works to a reader's desire for a particular reading experience. The blogging platform led to desired course learning outcomes by enabling students to share their reading experiences and their knowledge of genres, authors, and read-

er's advisory tools. By having the students blog their assignments rather than turn them into the instructor, the students were given the opportunity to communicate with a much wider audience and to learn from each other as an interactive learning community.

Because the blog posts were accessible to the entire class, the opportunity for peer-to-peer learning was greatly increased beyond that which was taking place in the physical classroom. Proof of peer-to-peer learning could be found in the comments students posted to each other's blogs. The students who posted assignments early also provided models for other students who were less sure of how to begin blogging their assignments. This was made apparent when one of the first assignments, writing an openly critical book review, presented a challenge to many of the students. The instructor referred them to exemplary student work posted online.

#### 3. Student control

The use of technologies in online learning enables increased *student control* over course content and over the design of assignments (Zach & Agosto, 2009). Blended learning in particular can afford increased student control ("personal agency") (Osguthorpe & Graham, 2003). The integration of the blogs was designed to increase student control, with the students maintaining complete control over their blogs from the initial design phrase throughout the term. They could choose the blogging software, added features, use of their real names or pseudonyms, the tone and style of their posts, when to post, and how often to post. Table 4 details some of the variation in how the students personalized their blogs. Six of the students chose to use their real names, and five posted an image of themselves, one of whom also posted images of children and pets. All of the students in the sample used at least two added blog features, with one using 14 added features. As Table 3 shows, seven of the ten students voluntari-

Table 4. Personalization of Blogs.

<b>Blog Name</b>	<b>Use of Real Name?</b>	<b>Pictures of Self?</b>	<b>Extra Features Used</b>
1	Yes	Yes	4
2	No	Yes	3
3	Yes	No	14
4	Yes	Yes	4
5	Yes	Yes	2
6	No	No	3
7	No	No	6
8	No	No	2
9**	Yes	Yes	2
10	Yes	No	2

\*\*Also included pictures of pets and children.

ly posted entries not assigned, and six of the ten posted an entry as a follow-up to a heated in class discussion, e.g., feminism and chick lit or quality versus demand in reader's advisory practice.

## Discussion

Most librarians in the future will be expected to work within a "collaborative paradigm" (Gunawardena, Weber, & Agosto, 2010, p. 217) that involves both in-person and online communication. Therefore, it is important for LIS students to experience the types of professional culture, knowledge sharing, and resource exchange involved in collaborative teaching and collaborative learning in both online and face-to-face environments, so that they can understand the value that communication in each type of environment can bring. In recent years, students in online teaching/learning environments have become familiar with many technologies that have not consistently found their way into face-to-face classrooms. However, when such tools are incorporated into face-to-face courses through the use of course-level blended education, student learning is enhanced in terms of both the immediate classroom experience and the preparation it provides for future professional collaborations.

Previous research has shown that online collaboration tools such as blogs can facilitate the integration of individual contributions to team or project-based work. This is especially important considering the growing trend of team management in all types of libraries (Bernfeld, 2004). While younger students are already familiar with many of these online tools, graduate students, especially those who have been away from academia for some time before returning to pursue an advanced degree, may not have been exposed to them. Ensuring that LIS students are competitive upon graduation is a responsibility of LIS educators in both online and face-to-face learning environments, and integrating carefully blended social technologies into both online and face-to-face courses can help to meet that goal.

In this study, data collected from students' blogs were used to assess whether Zach and Agosto's (2009) framework for maximizing student collaboration and knowledge sharing in online courses can be applied successfully to face-to-face courses. Blogs provide a "middle space" between online and traditional classroom settings (Oravec, 2003, p. 225), making them useful tools to assess course-level blended educational delivery. The results of the data analysis suggest that, similar to previous findings for online teaching/learning environments, there are several key criteria for blending social technologies into face-to-face courses. These include strong support of social presence, low learning curves, and easily facilitated student interaction. From this evidence we can infer that social technologies that are successful for supporting collaborative behaviors in online teaching/learning environments are likely to have similar positive effects in face-to-face and blended teaching/learning environments.

Previous research in the face-to-face environment has found that students perceive that blogs not only facilitate but also enhance their learning, especially their understanding of course content (Churchill,

2009; Ducate & Lomicka, 2008; Halic, Lee, Paulus, & Spence, 2010; Sharma & Xie, 2008; Williams & Jacobs, 2004). Analysis of data collected in this study demonstrated strong support for the concept of peer-to-peer learning as a result of blog usage. Other areas for which the data provided strong support were instructor participation/engagement, facilitation of learning, and student control. These areas are all important for fostering collaborative teaching and collaborative learning, which will prepare students to function successfully within a collaborative paradigm when they enter the workforce. This study has shown that social technologies such as blogging are well suited to sharing course content in face-to-face courses and that course-level blending can bring many of the educational benefits of online education into the face-to-face teaching/learning arena.

Blended learning environments, which can include the best characteristics of online teaching/learning environments (such as structured presentation, convenient dissemination of information, and support for self-regulated learning) and face-to-face teaching/learning environments (such as increased interaction and discourse with the instructor, easier structures for cooperative learning, and increased instruction clarity), are particularly well suited to fostering the skills needed to succeed within the collaborative paradigm. In addition, social technologies, such as the open source blogging tools used in this study, are used by libraries and their patrons alike. By including social technologies, such as the blogging tools used in this study, as part of the LIS curriculum, students are exposed to the advantages and disadvantages of these tools not only from the perspective of an information professional but also from the point of view of a user. This ultimately will contribute to their ability make critical decisions regarding the use of social technologies in providing library services, as well as their ability to aid library patrons in their use of similar technologies.

The limited data in this study related to drawbacks could indicate that at the course level, blending social technologies with low learning curves into the face-to-face curriculum might come with few downsides other than minor technological and student resistance issues. However, blending social technologies on a larger scale into face-to-face courses, especially technologies less familiar than blogs to most students, is likely to come with more significant drawbacks. Technological and student resistance issues are likely to be more frequent and more significant than they were in this study, and the high level of instructor participation and engagement necessary for sustaining active online participation among students in the current study could be seen as a significant drawback if the combination of face-to-face instruction and online instructor participation were to become overly time-consuming. For courses that already demand considerable instructor time for effective delivery, instructors might have to consider paring back face-to-face contact time, or reducing content delivery, or somehow restructuring courses to preclude excessive instructor time commitments in the new blended course format.

## Conclusion

This study suggests that LIS courses traditionally taught in face-to-face modes can benefit from the use of blended educational delivery that incorporates social technologies, provided that the blending is done with careful thought and planning. Knowing how best to structure blended courses can be a trial-and-error learning process. With the current sample course, for example, unequal student participation proved to be a barrier to true collaboration among students. Increased assignment structure, including specific due dates throughout the term for posting items to the blogs, would likely have reduced participation inequities and would have increased the levels of true collaboration

occurring online. The instructor plans to revise the assignment accordingly for future classes and to continue to experiment with assignment structure in order to find the optimal balance between imposed and organic participation.

Although this study and many others have shown that there are benefits to collaborative learning, students often resist collaborative work: “for many students, especially high achievers, *group work* is not a term to swear by, but rather one to swear at” (Isaac, 2012, p. 83). Isaac conducted a survey of undergraduate students’ attitudes toward group work. She found a high level of resistance to collaborative learning: “students were hostile to group work primarily because they found the activities inefficient and resented being dependent on peers” (p. 84). It is likely that many graduate students share these negative feelings of group work as well, whether studying in face-to-face, online, or blended modes.

Worse yet, Ellis and Hafner (2008) point out that resistance to collaborative learning comes not just from students, but from their instructors as well (p.168). If students and/or instructors approach collaborative work with negative attitudes, no use of social technologies—no matter the mode of delivery and no matter how well-designed—will result in optimal learning benefits. Further research is needed to investigate ways to mitigate negativity and to develop methods for helping students understand the social and educational benefits of peer-to-peer collaboration.

Regardless of student and instructor attitudes, true collaboration occurs only with participation, interaction, and synthesis. Providing exposure to social technologies does not in itself ensure collaboration and community building. Not only must appropriate technologies be selected, they must be integrated into the teaching/learning environment (whether online, face-to-face, or blended) in ways that support the desired student behaviors and learning outcomes. Criteria for selecting

technologies to afford successful student collaboration include strong support of social presence, low learning curves, and easily facilitated student interaction. In addition, their successful integration into the teaching/learning environment requires a high level of participation from the instructor and significant personalization of the collaborative experience to increase community building, engagement, and student learning. In view of the fact that the library and information service world is increasingly becoming a seamless mix of face-to-face and online interactions, we need to move away from thinking about educational delivery as a choice among face-to-face, online, or blended programs, instead working to provide students with blended educational delivery at all possible levels: activity, course, program, and administrative.

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