

## Introducing Social Software to K-12 Teachers in a Research Setting

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### Abstract

Twelve K-12 teachers who were enrolled in a graduate qualitative research course were introduced to collaborative software to use as part of work on group research projects. Data were gathered from one-on-one interviews, technology use surveys, and instructor reflections. Three themes appeared: a) the importance of developing learning communities when using these tools; b) overcoming inertia needed to get students to learn new software; and c) the conflict of technology use with instructional approaches.

**Keywords:** collaborative software, technology, graduate teaching, on-campus courses, teacher education

### Introduction

An increasing number of services are becoming available online that allow those working on the World Wide Web to gather resources and links to those resources in ways that are personal, convenient, and add meaning to the collected information (<http://socialsoftware.weblogsinc.com/2005/02/14/home-of-the-social-networking-services-meta-list/>). These resources include services as diverse as comprehensive bookmarking facilities (i.e. <http://del.icio.us>) to negotiated knowledge sites like Wikipedia (<http://www.wikipedia.org>). Beyond having these services available, most also include the ability to communicate a collection of information to others or to allow others to access an individual's collection of resources and information. Many of the sites provide opportunities for participants to work in virtual communities with others of like interest (Vallino, 2006). Broadly, these services are referred to as social software (Anderson, 2005).

The infusion of these tools into education has been mostly part of online learning courses (Anderson, 2005; Curtis & Lawson, 2001). On most college campuses, though, course management software has been made available to instructors of courses that meet face-to-face in addition to those courses that meet virtually. Part of typical course management systems is the ability for students to access course material asynchronously and for them to be able to communicate and collaborate with other students online via the software embedded in these systems. The ubiquitous use of course management software is promoting an environment where students are used to taking advantage of online learning opportunities.

Although the numbers are unclear as to what percentage of our newer students are coming to college already having used social software in one form or another, most indications are that it is a fairly high percentage. The familiarity of our students with both course management systems and social software suggests that faculty may be able to integrate appropriate uses of social software successfully in courses that meet either online or in physical classrooms. The purpose of this study is to examine the effect of the

uses of social software in an educational research course that meets in a traditional classroom setting.

Baird and Fisher (2005) are representative of an optimistic view toward the infusion of technology in teaching and learning, generally; and the use of social software more specifically, that suggests that students born after 1982 represent an always on generation who are comfortable with a wide variety of online communication and collaboration tools. Our job, as teachers in this environment, is to design curricular activities that take advantage of the predispositions of the students toward uses of technology in learning. Particularly, online learning communities can provide the opportunity for a high level of Vygotskian social integration. Course designs need to focus on elements of "social networking technologies [that] facilitate learning situated in a social context" (p. 9).

Collaborative online activities are likely to have more effect if they are oriented toward going beyond finding and using information to a level of knowledge construction (Warschauer, 1997). This would imply that the infusion of social software in a research course would be an ideal fit. A major difficulty in integrating technology into courses that meet face to face and have a tradition of being teacher centered is that use of technology is constrained by institutional and social expectations (Cuban, 1986). Building independent learning communities may work online for students with common interests, but it may be antithetical to their expectations of how traditional classroom collaborative relationships are to function.

In order to increase the likelihood that students can become engaged in online knowledge generation, it is important that attention is paid to issues that may inhibit the development of learning communities (Crampton, 2001). If students cannot figure out how to develop and sustain working relationships through electronic media, the quality of the outcomes of their learning activities will suffer. Crampton presents a complex model for understanding online collaboration by focusing on the need for groups to develop *mutual knowledge* among their members. She describes five types of information problems:

- failure to communicate and retain contextual knowledge
- unevenly distributed information
- differences in salience of information among members of a dispersed collaboration
- relative differences in speed of access to information
- interpretation of the meaning of silence. (p. 360)

These studies would suggest that successful infusion of social software into a traditional course structure will require careful course design to take advantage of students' pre-existing online social networking skills, helping students understand why the use of these tools is more appropriate than traditional instructional approaches, and advising students in how to develop productive online learning communities by insuring that project knowledge is shared efficiently and equitably.

## Methods

In this study, 12 masters of education students, eleven of whom were classroom teachers, were enrolled in a semester long qualitative research course. Six of the students were newly licensed, three were regular classroom teachers (two with more than 15 years of experience), two were special education resource teachers, and one of the students was working in higher education in student services.

On the first day of class students were told that the course would include group completion of a research paper on a topic of their choice. They were given standards for evaluation of the project. Subsequently, the students discussed a variety of topics of interest. They reduced a substantial list of topics to three of highest interest and then assigned themselves to the topics based on which they thought were most interesting. Three groups of four students appeared.

During each class meeting for the first half of the course the instructor made presentations on content related to qualitative research. In addition to traditional research course topics, the students were instructed in the use of electronic tools that might assist in their collaborative work. These tools included:

1. Online library databases and journals—the university in which the students were enrolled subscribed to approximately 122 electronic reference databases and over 23,000 online serials. All of these materials were available to the students both on and off campus;

2. [Google Scholar](#)—through Google, researchers searched the WorldCat database and accessed a variety of refereed journal articles, other scholarly resources, and information about authors;
3. [Del.icio.us](#)—online sharable user-defined bookmarks;
4. Wikis—multi-user editable Web pages;
5. [SubEthaEdit](#)—online collaborative writing tools;
6. Track Changes/Insert Comments commands in Microsoft Word;
7. E-mail—using attachments to facilitate collaborative work on writing projects and developing mailing list to facilitate discussion.

Students were encouraged, although not required, to include the instructor in collaborative communications. The above uses of social software were selected, because they afforded cumulative records of progress on projects which other members of each research team could evaluate asynchronously.

To monitor the effect of the infusion of these collaborative tools, data were gathered from a pre and post iteration of a survey of student technology use. The survey asked students to assess their general level of skill with technology, specifically about their use of the software introduced in the class, plus more general open-ended questions about their perceptions of positive and negative effects of working online with others.

Additionally, students were interviewed individually using a question protocol that included questions about successes and struggles related to working together online, perceptions of effectiveness, their sense of how community had developed, and a short series of questions related to Crampton's (2001) assessment of mutual knowledge problems of students collaborating online.

Finally, the instructor of the course wrote periodic reflections on how successful course activities had been and how instruction might be changed in the future.

The student interviews, instructor reflections, and open-ended survey responses were analyzed using a constant comparative qualitative assessment of dominant themes. The quantitative items on the student survey were reviewed for significant differences between pre and post responses.

## Results

Data gathered from one-on-one student interviews, surveys of student technology use, and instructor reflections revealed three consistent themes. These were: a) the importance of community in the process; b) overcoming inertia; and c) the conflict of technology use with instructional approaches.

*The importance of community in the process.* Few of the students knew each other when they first came to class. In order to accomplish the course objectives, it was important to form research groups on the first evening. A number of concerns related to community building and how that affected the use of technology surfaced over the course. These included problems related to technology skill and how ages of group members affected prior technology knowledge, obtaining and sustaining agreement on the direction of the group, how low technology skill group members were enabled by the more skilled users, trust among group members, and the degree to which the groups tried to supplant the need to work online with face-to-face work sessions.

The most prevalent recurrent theme that emerged in the participant interviews was the discrepancy between the technology skills among group members. When mentioned, the lower skill level was associated with the older age of the group members. Participants indicated that the skill/age discrepancy affected collaboration, communication, and community building in the individual groups. In fact, one participant responded to the survey prompt, "Write a bit about what you see as the positives of working online with other people" with "Those who you don't like, you don't have to see them and can make comments without them hearing." Also, in one of the three groups, a "splinter group" formed of two of the most technology-skilled participants (the only two males in the course, ages 21 and 22). One participant reported there was community with "like ages" and referred to the "young, arrogant" group members. There was a 38-year range between the youngest participant (21 years) and the oldest participant (59 years). The

mean age was 31, the mode was 22, and the median age was 22, indicating a positively skewed age distribution of the participants. Interestingly, age and participants' initial and concluding self reports of their technology skill level was not statistically significantly correlated ( $r = -0.436$ ,  $p > 0.05$ ). It appeared that some generational trust issues and individual perceptions may have been interfering in community building versus an actual relationship between technology skill and age of the group member. Some participants who were younger also had low technology skill levels.

This difference in technology skill level was evident in how the K-12 teachers rated their technology skill level on a five-point, ordinal scale at the beginning and end of the semester. The response categories were: a) Non-user; b) Minimally Skilled; c) Moderately Skilled; d) Accomplished; and e) Expert. From the beginning to the end of the semester the mode increased to 4 (Accomplished) from an initial mode of 2 (Minimally Skilled). Using a chi square, results indicated there was a statistically significant increase ( $p < 0.01$ ,  $df = 4$ ) in how participants rated their skill level.

It was evident from the participant interview responses to "In what ways has a sense of community developed in this class" that the sense of community was chiefly within each research group rather than with the class as a whole. Several students variously referred to being "close in our own group." Groups were encouraged to "cross-pollinate" for information and solutions but chose to work solely among themselves.

When asked "How has the *use of technology* affected your sense of community in class," students referred to their use of the wiki where they could communicate among themselves and hear what other class members had to say, even if they did not frequently post to it. Several students mentioned the wiki was useful to communicate with the professor and appreciated his constant involvement and quick responses to questions via the wiki. The sense of community was also aided by technology through the use of e-mail and with the ability to write and revise work as a group online. Though technology assisted a sense of class community, there was still inertia to overcome regarding its use.

*Overcoming inertia.* As graduate students, these teachers initially had difficulty seeing how applications of technology could make their work more effective or efficient. This manifested itself in a number of ways, including selecting only those technologies that group members already knew how to use, convincing students that the technology could increase the efficiency and effectiveness of group work, and students resisting learning new technologies for which they did not see an immediate use.

Participants were asked "How has the technology helped you be successful in completing the work for this course." E-mail, editing, and attachments were cited most frequently in the participant interviews as being useful in completion of the group research project. Other frequently mentioned resources were chats/IM, Google Scholar, and online searches of sources for the literature review. When asked how they struggled with technology in the course, there was a split in responses between those who embraced using technology and those who had less experience using technology. It became evident during classes and during the interviews that when a group member struggled with technology, the other members created a "work around," like putting the full text within an E-mail versus sending the text as an attachment and bringing hard copies of articles to give to the individual at the next class meeting. These strategies were expedient, but they essentially enabled those less skilled with technology to remain so.

In examining whether there was a broader use of technology by the participants from the beginning of the semester to the end, a wider variety of technology use was evident. However, much of the greater use had to do with professor-led explorations of such tools as [De.licio.us](http://del.icio.us), wikis, [Google Scholar](http://scholar.google.com), and online databases. There was a tendency of students to give up easily if something (De.licio.us) was tried, and there was not immediate success. It was not uncommon to hear in the interviews from the students with lower technology skill that they liked a particular use of technology when it was presented by the professor, but that they did not use it on their own afterwards in the completion of the group research project.

*The conflict of technology use with instructional approaches.* The open-ended use of technology tools and resources in teaching and learning is effective when learning activities are project based. This course was designed with this in mind. The attempt was to provide as pure a project-based environment as was possible and to allow for the integration of social software and other technology tools. Although the course may have been designed that way, students did not approach the work in this manner. The professor noted students wanted detailed instruction on how to use software and wanted this instruction repeated at the

exact point they might be using the software. Groups ignored the opportunity to explore uses of newly-presented software in their collaborative work. Students resisted completing assignments designed to practice using new software. Students had trouble imagining a transfer of newly-learned strategies into their own classrooms citing concerns related to student safety on the Internet.

Some of the participants could see how their newly-learned strategies could be implemented in their teaching environment. The most frequently cited use of technology in the classroom was to have a classroom Web page to which the teacher could post information for students and parents regarding homework, class units, a calendar, and special class events. With an electronic calendar, due dates and copies of assignments could be linked. The participants also could see using wikis in their classrooms, even with children in first and second grade. One teacher saw how a wiki could be used by kindergartners. Online journals and class journals appeared popular, and students and teachers using PowerPoint was not uncommon, especially in schools that had funds for technology purchase and maintenance of the equipment. Interestingly, three teachers mentioned implementing student mini-research projects with an approach similar to what was used in this study.

It was evident from the interviews that some teachers wanted to continue to be cautious in implementing the use of social software and technology in their classrooms. There was concern with students using technology to bully others and post inappropriate items. There was also an issue that in lower socio-economic areas and with students who live in migrant camps that accessibility at home to technology could be problematic. Those teaching children who were English Language Learners mentioned the scarcity of materials available in other languages.

Although this research course was designed to encourage the use of technology and social software in completing a group research project, there were efforts to supplant the use of technology with face-to-face interactions. Participants expressed in their interviews and on their surveys that face-to-face interactions were better when brainstorming, coming to an agreement on the research topic, sustaining a common direction in the research, and with some aspects of the communication process. In particular, participants commented on not seeing facial expressions or body language, or knowing the emotional inflection in a comment. They also commented on the instantaneous response available with face-to-face encounters versus having to wait for an e-mail response. The operational definition of a "quick" online response varied from "within hours" to "within the week before the next class." Thus, meetings were set outside of the scheduled class to work in person. In spite of this, participants reported there were not difficulties related to Crampton's (2001) other issues around the development of *mutual knowledge*: unevenly distributed information, difficulty communicating, or understanding the importance of specific information. The online use of technology did not interfere with any of those processes associated with mutual knowledge, even for those students with low technology skills.

## Conclusions

Overall, the inclusion of the use of social software in a traditional educational research course *did no harm*, but it is not clear that, at least in this iteration, it provided a substantial advantage to student learning. Specifically, the ability for groups to develop a community in which they could accomplish collaborative goals was more important than whether they were effective users of technology. Although the students showed some greater confidence with these uses of technology as the course progressed; in general, those students who were comfortable users of technology before the course were more likely to try to incorporate social software into their work than those who were initially less competent. Baird and Fisher's (2005) optimism that we are teaching an *always on* generation of students did not match the reality of students trying to find ways to work together in this traditionally-delivered higher education course.

It appeared that it is not sufficient to teach students how to use social software and to provide an environment that supports the software's use. Teachers who incorporate these tools in teaching and learning need to consider carefully what instructional strategies best match student technology use, the way that these tools are introduced in the curriculum, and most importantly, how to build learning communities in which learners encourage each other to incorporate collaborative electronic tools in the learning process effectively and efficiently.

We expected to see Crampton's (2001) problems related to mutual knowledge development appear among the students. Generally they did not. Students were able to circumvent problems related to the distribution

of information about the projects some times by returning to face-to-face interactions but most often by using technologies with which most of the students were familiar (i.e., attachments in E-mail). When problems did appear, they were more often related to personality conflicts than to issues generated from trying to distribute information in order to accomplish the group tasks.

This is a small study, and the idiosyncrasies of this set of students may not be particularly representative of the students that will be moving into our programs in the near future. Also, this was the initial use of a number of these electronic tools in a course by the instructor. It is uncommon that innovations in instruction work well the first time even for seasoned faculty. Problems in the infusion of technology in this course may also be related to the fact that these students were in a graduate program in which uses of technology only appeared in a few courses and even then mostly related to library research. This course was atypical of their other experiences within the program. Regardless, it was clear that when given the choice, this group of students would consistently choose face-to-face interactions over electronic tools even when presented with evidence that electronic tools had a *value added* component to them.

We have no doubt that as the electronic tools available to students become more powerful, and as the ease of use of social software increases, that some of these tools will become necessary components of higher education teaching and learning regardless of the instructional setting. Some already have. What cannot be assumed is that students will be able to use these tools effectively without being comfortable participating in and developing learning communities. The strength of social software is that it improves collaboration when students are working together online. It does not teach users to collaborate but rather has the potential to improve collaboration that already exists. Not surprisingly, collaborative learning with technology is unlikely to be effective if collaborative learning without technology is difficult.

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